

*Agroforestry, Trees, and the Cultural Landscape of
the Limpopo National Park, Mozambique*



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***A preliminary research report for the World Agroforestry Centre and the
Transboundary Protected Areas Research Initiative***

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Agroforestry, Trees, and the Cultural Landscape of the Limpopo National Park, Mozambique

This report documents exploratory ethnographic research on agroforestry practices in the Limpopo National Park, Mozambique, June 16 to August 7, 2003. The research was made possible with support from the Transboundary Protected Areas Research Initiative¹ and the World Agroforestry Centre². Divy Mavasa served as my research assistant.

The report consists of four sections. First, I list contacts made through the research. Second, I introduce the site where I conducted field research and situate the study within the regional context. The third section is a descriptive analysis of trees and land use in the Limpopo National Park (LNP). Here I describe agroforestry practices and illustrate the importance of trees and tree products to individuals in communities throughout the LNP. Questions presented in my research proposal guide this section. The fourth section is a discussion of the relevance of a land use study in this specific regional context.

I. Contacts

This project is part of a long-term research initiative to increase the visibility of local history and resident land use in the Limpopo National Park. The ability to effectively achieve these goals is dependent upon both significant time spent in the LNP and the opportunity to collaborate with interested individuals and institutions. Establishing relationships with relevant actors proved important to my entering the LNP and substantiates the potential for further research. Contacts outside of the LNP were made through collaboration with the Transboundary Protected Areas Research Initiative (TPARI). The TPARI aims to increase social science research in international protected areas. This group provided financial and logistical support for my research and access to rich archival data from the Witswatersrand Native Labor Association and the Employment Bureau of Africa³.

In addition to distinguished residents, including park employees, of the LNP, the following individuals are essential to the ongoing success of this collaborative research initiative. As such, meetings and interviews with the individuals listed herein contributed tremendously to my research.

- Harold Annegarn. Executive Director, Atmosphere and Energy Research Group, University of Witwatersland.
- David Grossman. Ecologist and consultant to the Project Implementation Unit of the GLTP.

¹ <http://hdgc.epp.cmu.edu/misc/TBPA.htm>

² <http://www.worldagroforestrycentre.org/home.asp>

³ A collaborative paper based on these archives is forthcoming.

- Joanna Lucas. TPARI, Wits Rural Facility.
- Daniel McCormick. TPARI, University of Witswatersrand.
- Alberto Macucule. Department of Forestry, Eduardo Mondlane University.
- Hector Magome. Director of Conservation, South African National Parks.
- Patrick Matakala. World Agroforestry Center, Mozambique.
- Stewart Miller. TPARI, Department of Social Anthropology, University of Witswatersrand.
- Ernest Mokganedi. South Africa Department of Environmental Affairs and Tourism.
- Simon Munthali. African Wildlife Foundation.
- David Newton. TRAFFIC, the wildlife trade monitoring network, Endangered Wildlife Trust.
- Vincent Parker. Mozambique Bird Atlas Project, Endangered Wildlife Trust.
- Peter Rogers. TPARI; Department of Environmental Studies, Bates College.
- Piet Theron. South African National Parks.
- Conrad Steenkamp. TPARI, University of Witswatersrand; Center for the Integrated Study of the Human Dimensions of Global Change, Carnegie Mellon University.
- Billy Swanepoel. Project Implementation Unit, Limpopo National Park.
- Unjinee Upoonan. TPARI, University of Witswatersrand.
- Robert Thorton. TPARI; Department of Social Anthropology, University of Witwatersrand.
- Arrie van Wyk. Project Implementation Unit, Limpopo National Park.
- Wouter von Hoven. Center for Wildlife Management, University of Pretoria.

II. The Limpopo National Park, Mozambique

On November 10, 2000, government officials from Mozambique, South Africa, and Zimbabwe agreed to a Memorandum of Understanding, which committed significant portions of land to the creation of the Great Limpopo Transfrontier Park (GLTP).⁴ One year later, on November 27, 2001, a preliminary step towards realizing this goal was achieved when more than one million hectares of land in Mozambique were designated the Limpopo National Park (LNP) (Grossman and Holden 2003: 6 and 11). The thirty-five thousand square kilometer GLTP will link the Limpopo National Park with Kruger National Park and the Makuleke Region in South Africa, and Gonarezhou National Park, Manjinji Pan Sanctuary, Malipati Safari Area, and Sengwe Communal Land in Zimbabwe⁵. The GLTP will be the heart of the even more ambitious one hundred thousand square kilometer⁶ Greater Limpopo Transfrontier Conservation Area (GLTCA) which, in addition to the aforementioned lands, will include Banhine and Zinave National Parks in Mozambique. Refer to Appendix A for a map of the GLTCA.

The Limpopo National Park spans ten thousand square kilometers of arid land in Mozambique's southern Gaza Province (Hatton *et al.* 2001: 36) in the districts of Chicualacuala to the northwest, Mabalane to the east and south, and Massingir to the southwest (Holden 2001: 48). Refer to Appendix B for a map of the LNP.⁷ An electric fence forms the park's western border and separates the LNP from South Africa's Kruger National Park. Although official LNP boundaries have not been finalized, the Limpopo River approximates the park's northern and eastern boundaries, and to the south, there are the Olifants River and the Massingir Dam.⁸ Running roughly parallel to the Limpopo is the Shingwedzi River which flows through the central west of the LNP and meets the eastern running Olifants due east of the Massingir Dam. The entirety of Mozambique is subject to cyclical drought, and the land comprising the Limpopo National Park is reported to receive the country's lowest levels of rainfall (Holden 2001: 10).⁹ The landscape is described as Limbombos Woodland and Shrubland and Mopane Woodland (Hatton *et al.* 2001: 24) and is characterized throughout by wide-open stretches of acacia and mopane.

In 1969 the area comprising the LNP had become Coutada 16 hunting concession (Hatton *et al.* 2001: 36). Mozambique gained independence from Portugal in 1975, and, within a year, the country was engaged in a sixteen year war (Cabrita 2000: xv),¹⁰ during which an

⁴ <http://www.peaceparks.org/content/interactive/story.php?tfca=2>

⁵ <http://www.peaceparks.org/content/interactive/story.php?tfca=2>

⁶ <http://www.peaceparks.org/content/interactive/story.php?tfca=2>

⁷ I am indebted to Piet Theron of the Peace Parks Foundation for providing maps.

⁸ To reiterate, these are geographic boundaries, not official political borders.

⁹ Unlike the Olifants River, the Limpopo River dries towards the end of winter (Holden 2001: 32). The Shingwedzi River is smaller than both the Olifants and the Limpopo and dries from May through September. Fed by deeper streams originating in the Lembobo Mountains, the Shingwedzi is able to maintain pools throughout the dry season (Holden 2001: 32).

¹⁰ Hatton *et al.* (2001) confine the war to twelve years. In the most remote village of the LNP, the fighting reportedly did not begin until 1985 (personal communication, Makandezulu A, 7/18/2003).

estimated six million people, roughly half the nation's population (Hatton *et al.* 2001), became refugees (Unruh 2002: 3). Following the Renamo/ Frelimo cease-fire in 1992, people continued to stake claims and cultivate land left fallow during wartime (Unruh 2002: 3). Though people migrated out of Coutada 16 towards the beginning of the Renamo/ Frelimo war, between 1980 and 1996 the population of the Massingir District had almost doubled (Holden 2001: 44).

There is little documentation about the history of the region's biodiversity; however, it is assumed that mammal populations in Coutada 16 decreased severely since the concession's designation, particularly following the war. During this time, natural resource management suffered, and wild animal populations throughout the country were decimated (Hatton *et al.* 2001). Hatton *et al.* (2001) place much responsibility for resource exploitation on Renamo and Frelimo soldiers who hunted the game populations both for food and for trophy (2001: 14). Hunting did not cease with the close of the war as de-mining initiatives, repaired roads, and safer landscapes enabled urban dwellers renewed access to game (Hatton *et al.* 2001).

Mavasa and I saw much of the land that makes up the Limpopo National Park. We spent the majority of our time in the villages of Mavodze, Makandezulu A, and Mapai. Additionally we had insightful visits to Massingir, Chimangue, Mapai Nghala, Buiela, and the wildlife sanctuary near Massingir Velho.¹¹ The LNP's current population is estimated at 27,000 (Grossman 10/29/2003). Approximately 6,500 people live along the Shingwedzi watershed in the villages of Mavodze, Massingir Velho, Bingo, Machamba, Chimangue, and Makandezulu A and B (Holden 2001: 45). With limited access to markets, the majority of people in the LNP depend on agriculture and sometimes livestock for subsistence (Holden 2001: 46). When there is rain, families farm close to home or begin gardens in their yards. Though they were not used during the dry weeks that Mavasa and I were there, agricultural plots exist along the road near each village in the Shingwedzi Watershed. Active farms were located at a distance from residents' homes.¹² These farms are particularly important during the winter months when there is little rainfall.

Mavodze is the first village Mavasa and I visited. For the most part, residents live near the road and farmed a few kilometers away from their homes directly in or near water sources. Two of these locations are on the Massingir dam and one is along the Shingwedzi River. In Makandezulu A, one plot of land was being communally farmed. It is located in the center of town, adjacent to the village's water pump and within a kilometer from what was, in our time there, the only remaining section of river near the village to hold water. According to members of the Project Implementation Unit (PIU) (7/23/2003) and to notes compiled at a community workshop held in Maputo (2/27/2002), Makandezulu A is being considered for relocation. Though both sources were

¹¹ As communication within the LNP occurs in person, residents were unaware of our coming. Mavasa and I simply drove to the villages and asked permission to stay. The only exception to this was our visit to the wildlife sanctuary near Massingir Velho which occurred with park employee Billy Swanepoel and TBPARI researcher Stewart Miller.

¹² These distances varied from one-half to three kilometers.

under the impression that people in Makandezulu A want to be relocated, the residents with whom Mavasa and I spoke do not want to leave their land. Relocations in the LNP are envisioned as solely voluntary, and more recently there has been indication that relocations will not occur without further community engagement (Grossman 10/29/2003).

Populations along the Limpopo River are higher than the Shingwedzi, and, in general, people in towns and villages along the former have better access to markets and a more diverse subsistence base. Although the attached Peace Park Foundation (PPF) map does not show them, there are villages just east and west of the Limpopo River. Mavasa and I visited Mapai Nghala and Buiela located to the east of the river. These villages appear to be of comparable size, if not larger than the communities along the Shingwedzi, which do appear on the map. The villages along the Limpopo that are represented by PPF are located several kilometers east of the river. Although park boundaries remain to be officially defined, these towns, presumably, will not be incorporated into official park boundaries.

Mapai, which has its own market, is located along a good dirt road and railroad tracks. Though it is unlikely that Mapai will be incorporated into official park boundaries, the town is being considered as a relocation site for residents of the Shingwedzi Watershed (notes from a community workshop, 2/27/2003). Residents of Mapai farm along the Limpopo River, traveling the twenty kilometer road by foot or car. The eastern and western sides of the Limpopo River nearest to Mapai were lined with agricultural land. Additionally, people farm directly in the dry sections of river bed and garden on the steep banks of the river.

Interviews were conducted primarily in the Shangaan language and were translated to English by Mavasa. Portuguese was used in Mapai particularly with government officials; though, even there, Shangaan remained the predominate language of our meetings.

These visits were particularly important in light of the potential rate of change that will characterize the landscape and its residents. From the community to the international level, decisions concerning the management of local people are at the forefront LNP political debate. Potential changes include resident relocations, the fencing in of communities, and restricted land use based on park zoning. (Appendix B illustrates proposed land use zones.) Thus, the research enabled a preliminary view of a park in the making and an introduction to a landscape that is likely to undergo significant change in the years to come.

III. Agroforestry, trees, and land use in the Limpopo National Park, Mozambique. Research questions and answers

1) What kinds of agroforestry practices exist on the Mozambican side of the Great Limpopo Transfrontier Park?

The ability to accurately answer the first question of my research proposal depends upon how one defines agroforestry. In the context of my “in the field” research explanations, I generally defined agroforestry as “the presence and use of trees on farmland”. Intentionally inclusive, I used this definition so as to elicit as wide and representative an understanding of agroforestry in the Limpopo National Park as possible. Based on this definition, agroforestry does exist in the Limpopo National Park, though not in particularly obvious forms. While in the park, I encountered no evidence of externally driven agroforestry initiatives. Nor did I encounter people planting trees or other woody perennials on currently productive farm plots.

Preliminary research suggests that agroforestry is most prevalent in the Limpopo National Park in the form of *leaving trees on farm land*; that is, in the regional context, agroforestry is a land management decision by which people choose not to remove specific trees when clearing land for farming while they choose to cut others down. According to a farmer living near the Limpopo River, examples of trees not cleared when creating agricultural land include: Xiyimanamurhi, Miscakwanhi, Miniyiyii, Mikuwa, Mintowa, Nwampya, Nkanyi, Nxukutsi, and N’wamba (personal communication 7/21/2003).

Throughout the region large trees appear on agricultural plots; such tree presence is sparse, yet consistent. Generally these fields are placed just off the road, in a clearing of mopane and acacia trees, so that woodlands exist on one to three of the other sides of the plot. The agricultural landscape is also characterized by large stretches of farmland that are all but devoid of trees. Such landscapes exist on both the Massingir Dam and along the Limpopo River. At each, larger trees reportedly fall down during floods, while smaller trees are removed by humans.

2) Is agroforestry a form of indigenous, local, or small-scale conservation in Mozambique? Has it been in the past, could it be in the future?

Nair has referred to agroforestry as an “ancient” farming technique (1993: 3), claiming that the term is “a new name for a set of old practices” (1993: 13). This second set of questions arose from an interest in relating Nair’s description to the context of the LNP. Nair (1993: 13-14; my emphasis) offered the following description of agroforestry:

the *deliberate* growing of woody perennials on the same unit of land as agricultural crops and/or animals, either in some form of spatial mixture or sequence [in which] there must be a significant interaction (positive and/or negative) between the woody and nonwoody components of the system, either ecological/or economical.

The quote illustrates how intent may function as a defining characteristic of agroforestry practices. Externally driven agroforestry initiatives, for example those introduced by NGOs, the private sector, and parks, are explicitly concerned with the potential social benefits gained by people who have access to these systems. As a result, and as illustrated in the above definition, research pertaining to externally driven agroforestry initiatives focuses on farmer intentionality, incentives, and production pressures (Fairhead and Leach 1998: 179).

Fairhead and Leach assert that though indigenous knowledge is legitimized in agroforestry research, a focus on farmer' intent obscures "the cumulative effect of social processes such as settlement, and the more complex layers of tenure and social institutional control [that are] linked to such landscape history" (1998: 179-180). Following Fairhead and Leach, I suggest that in contrast to research concerning externally driven agroforestry initiatives, farmer intent need not be a distinguishing factor in the context of local agroforestry practices in the LNP.

To propose that intent should not be a defining characteristic of local agroforestry practices is not to suggest that local farmers are unaware of the ecological benefits of leaving trees on agricultural land. Farmers did discuss ecological assets of trees, revealing knowledge of the relationship between, for example, soil conservation and tree roots. In one village, for example, community members are planning to clear a section of land on the far side of the stream that serves as one of the community's primary water sources. Due to its location, irrigating this plot would be extremely efficient; thus, the strategy of planting there is evident, especially in relation to all but one of the other plots in and around the village which were, at the time of our visit, completely dry and reportedly had been unproductive for much of the year¹³.

Three senior men, Mavasa, and I sat along the stream bank, and discussed the future plans for the plot of land the men hoped to clear. Community members have never farmed this area before; it is referred to as part of 'the bush' and remembered as a place where people hid during the war. Community members reported to us that they planned to clear the land with axes and machete-like tools. I asked which plants would be cleared. "Most of the small trees and plants will be taken out; however, the big trees will remain on the land. They are not a problem. The small ones block out the sun. The big ones give shade to the elephants¹⁴, and as the roots expand, they make the soil happy." Additionally it was reported that shade resulting from the decision to keep big trees on the land may prevent the soil from drying out too quickly: "If the land dries too quickly, termites will begin to feed." (personal communication 7/16/2003).

¹³ During our time in the LNP, food aid was distributed to communities of the Shingwedzi Watershed.

¹⁴ I asked if the trees provide shade for humans too. "Yes, to all animals" (personal communication 7/16/2003). Prior to this conversation, we had been discussing elephants. Despite rumors of animals outside of the wildlife sanctuary, Mavasa and I had been surprised to encounter elephant dung several kilometers north of the sanctuary.

Throughout the park, residents rely on fruit from trees in their yards to supplement their subsistence needs. To the extent that decisions to leave particular trees on agriculture plots constitute conservation, agroforestry is a form of indigenous, local, and small-scale conservation in the Limpopo National Park. In the above conversation, it is revealed that the primary criterion by which a tree would be left standing on the landscape is size. Though expressed in ecological terms, that is, in response to shade, the degree to which conserving time and energy influences farmer decision-making should not be underestimated. Agroforestry practices also occur in the LNP at a smaller scale – in people’s yards. Both in Makandezulu A and in Mapai, some residents interplant trees with other subsistence plants both to conserve water and to maximize the use of fencing materials.

3) To what degree do the residents of the LNP depend on trees for increasing food security?

The degree to which residents of the LNP depend upon tree resources to achieve, maintain, and increase food security cannot be overstated. This third question remains crucial to research in the Limpopo National Park, as, during our time there, food insecurity, to various levels of intensity, characterized the entire region. Tree products serve as food, fuel, fodder, and fences; all of which contribute to increasing food security year-round in the park.

Appendix C is a chart that lists the trees of the Limpopo National Park which are important to residents of the LNP. The list reflects what people explained to us; thus the Shangaan names and associated human significance are based entirely on ethnographic data. Shangaan tree names were given to us by LNP residents then spelled out to me by Mavasa. Unfortunately, even the best written resources do not include the Shangaan names for trees. Where possible, I have attempted to match Shangaan names with Latin and English names. I did so only where (1) Shangaan names, were extremely similar if not identical to the Tsonga, Venda, or Zulu names included in Schmidt *et al.* 2002 and (2) descriptions of human significance recorded in our notes related to the corresponding descriptions included in the same valuable resource. Mavasa was essential to the compilation of this list.

Due in-part to the decision by farmers to leave them on the land, fruit-bearing trees appear throughout the landscape of the Limpopo National Park. Though few bear fruit during the region’s dry winters and droughts, human dependence upon fruit trees persists. Products obtained from the Nkwankwa and Nxukutsi trees, for example, are vital to people, particularly in times of drought. East of the Limpopo watershed, in the town of Mapai, we were told about a type of powder made from the fruit of the Nkwanka tree. The course orange powder is dried fruit which is sweet and bitter. The powder reportedly remains edible for months after making it and is eaten during times of drought and war.

People living along the Shigwedzi watershed have a great affinity for the Nxukutsi tree where, without the tree, “one would have found that more people (would have) died ... whether there has been rain or without rain, the roots are always with water...”

(personal communication 7/16/2003). The tree was referred to by a woman in Makandezulu A, one of the villages near the Shingwedzi River, as a survivor tree because it has a history of saving people during drought. Though Nxukutsi do bear fruit¹⁵, they do not produce during dry times; therefore, especially during drought, the roots of the Nxukutsi are depended upon for survival. Residents of both the Shingwedzi and the Limpopo Watersheds make a type of tea out of the roots, which they dig up and pound to soften. Then, they remove the bark and cut, grind, and soak the roots in boiling water. If the root is not sweet¹⁶ after it is cut, it is not used, and the roots are allowed a few more years to ripen¹⁷.

Though not discussed in the context of food security, among the primary ways in which tree products enable people to live on this landscape is by providing fodder for livestock. Throughout the region, Mavasa and I witnessed livestock feeding on tree foliage from what appeared to be an indiscriminate number of tree varieties. Further research focusing on trees as resources for livestock would be helpful in identifying the preferred fodder species. Trees are also used to build fences. Fences, to varying degrees of success, prevent pests, livestock and game from entering agriculture land. Additionally, wood from acacia and mopane is used to make cattle driven sleds for transport of agriculture goods. As the distance from farm lands to homes are often extensive, and farmers make the trek multiple times a day; thus, these sleds are important technological devices for those families who have them.

4) What are the consequences of Maputo charcoal industry and other extractive land uses on the LNP's landscape?

Preliminary research suggests that the Maputo charcoal industry has minimal effect on the LNP landscape. Preferred trees for charcoal production include: Nxanatsi, Nkaya, Ntsotso, Xivondzwani, and Mondzo. It was explained to us that, though these trees are prevalent on park land, the lack of suitable roads for the transport of the wood restricts its movement within and out of the park. However, trees on lands east of the Limpopo River, and east of the LNP, are cut for charcoal, picked up by truck, and taken to Mapai. Charcoal is then either distributed in Mapai, or it travels down to Chokwe by either train or large truck.

According to Hatton *et al.* (2001), high value trees of considerable importance for export which are currently being exploited in Mozambique include: *Berchemia discolor*,

¹⁵ The tree has light red fruit. The specific Nxukutsi to which we were referring was without fruits at the time (7/16/2003) due to the lack of rain. It was pointed out that if one eats too much of this fruit, they will get constipation, while if one eats too much of the root, diarrhea

¹⁶ "Sweetness" is measured by the ability of the root to burn one's eyes; if it doesn't burn (like an onion), it isn't ready. After boiling, foam is wiped from the water before drinking. The water will be sweet like sugar.

¹⁷ I asked if the tree dies after the roots are cut. It was explained that only the roots that are closest to the surface are used, so the tree can live.

Dalbergia melanoxylon, *Azelia quanzensis* *Milletia stuhlmannii*, and *Khana nyasic*¹⁸. Based on cross-referencing these trees with Schmidt *et al.* 2002, all but the latter two are extremely likely to be found in the Limpopo National Park. As with charcoal, the lack of infrastructure in the LNP, particularly the lack of roads and vehicles, inhibits potential timber export out of the park. The only evidence of large scale extractive land use that I witnessed in this region was a pile of trees lying next to the railroad tracks in Mapai¹⁹. The trees were reportedly going to be used for making furniture. They were cut down east of Mapai; thus several kilometers from the Limpopo River, and several kilometers outside of the GLTP.

Within the park, fuel wood is a dominant means of resource use. Women collect wood from nearby surrounding areas and gather only nearby, fallen wood.

5) Are park implementers integrating agroforestry practices in the creation of buffer zones?

Agroforestry systems are integrated into the creation and management of buffer zones surrounding national parks to protect park resources and to improve standards of living (Nair 1993: 153). As of August 2003, park managers were not implementing agroforestry practices in the creation of buffer zones. The potential for agroforestry initiatives to be incorporated in the creation of LNP buffer zones depends, first and foremost, upon the delimitation of park boundaries. To my knowledge, the official eastern boundaries of the Limpopo National Park have yet to be finalized; thus the official borders of potential buffer zones are not clearly defined.

According to the 2002 PPF map (Appendix B), land along the Limpopo River will become the park's buffer zone. On the ground, however, this land is being managed as a natural resource use zone, and significant sections of the river are lined with agricultural plots. Big trees, down since the 2000 flood, lie in dry sections of the river bed, and there are gardens along the steep river banks which capitalize on the banks' remaining soil. Though it is, perhaps, premature to speculate about plans for the implementation of riparian zone projects along the Limpopo Watershed, it is important to consider the potential for such initiatives to undermine local access to limited farm land, particularly as populations there grow.

6) Are trees being used as evidence of land tenure? Is the legitimacy of land claims changing with the incorporation of Coutada 16 into the GLTP?

The Limpopo National Park has become a landscape of international, national, and local authority, and, at this point, it is difficult to discern how incorporation into the Great

¹⁸ The aforementioned trees species do have potential for local subsistence use including food, building material, and medicine (Schmidt *et al.* 2002).

¹⁹ A meeting at the Endangered Wildlife Trust in Johannesburg increased my awareness of the elusive timber trade in Southern Africa. Raw wood is an important resource for Mozambique and it's disappearance from the land remains problematic. Though material records are poor, one possibility is that wood travels from Mozambique through South Africa to global ports (Newton 6/24/2003 personal communication).

Limpopo Transfrontier Park will affect resident land tenure. As such, the questions for this section were formulated so as to gain a better understanding of land tenure in the region and to measure the degree to which Unruh's 2002 findings could be applied to the LNP context. "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." (Unruh 2002: 3). Mozambique's 1997 land laws attempted to legitimize small holdings by recognizing customary law regarding land tenure (Holden 2001: 45). Unruh (2002) suggested that, in Mozambique's post-war context, agroforestry practices function to legitimize 'informal' claims to land.

Preliminary research suggests that local notions of land tenure are defined by a history of access to regional resources. The most salient example of this was one man's response to the question: "How do you know this is your land?" Included in his answer was a detailed history of the Shangaan people and their arrival on the LNP landscape. He then moved on to the founding of Makandezulu before the village split into Makandezulu A and B. He concluded by informing us that the land is his because he knows someone who was born there and if you are born there or know someone who was; it becomes yours.

Farm lands and the land on which people build their homes are regarded by park residents as belonging to the families and individuals who use them. This is not to suggest that communal work and communal property do not exist. For example, people in Chimangue worked the same plot of land, but distinguished between separate rows of crops which were owned by individual families. Further, in Makandezulu A, community members pooled scarce resources into one plot²⁰ where they did the work of planting and watering sweet potato starts²¹ together. There were no signs of individual ownership of rows or plants and no indication that those who did not show up to work would fail to reap the harvest.²²

Unruh (2002) discussed trees and agroforestry practices as cultural ecological evidence of historic use of the land and suggested that such evidence legitimizes resource tenure. Further research is needed to assess whether or not trees or agroforestry practices legitimize claims to land in the LNP. As of yet, specific local land claims are not being contested; thus, discussions concerning land claims remained abstract. Preliminary results do not indicate that local people are explicitly cognizant of the potential for tree

²⁰ It was explained to me that the plot community members were using was owned by a man who had temporarily moved to South Africa to "escape the drought".

²¹ The sweet potato starts had been given to the community by an NGO, *Programa Mundial de Alimentacao*, or the World Food Program. In exchange for road work, residents of Chimangue also received sweet potato starts.

²² It is my impression that this type of communal plantings, while not unheard of, are not the norm. Had the sweet potato starts not been donated and had the town not been experiencing a drought, I do not think that this level of community farming would have occurred. While the subsistence base in Chimangue was much better than that of Makandezulu A, the communal planting in the former may also have been influenced by the nature of the food source. Seasonality may have also influenced Chimangue residents' decision to plant communally as the river was low and new, perhaps unclaimed, lands had been opened up for farming.

management through time to evidence resource tenure in the Limpopo National Park. There were, though, cases wherein trees were noted in reference to identifying land. I asked a woman in Makandezulu A how, after years of living in South Africa and Mapai due to war, she recognized her home as hers. She pointed out two trees: an Nkwankwa and a Nyiya. The trees were how she identified this piece of land as home. A man in Mapai had a similar response in reference to some trees in his yard that were on the land before his family moved there²³. When asked how, hypothetically, he would recognize the place as home following a flood or after returning from years away, he pointed to an old Nkanju tree. Although these anecdotes give insight into individual cognition, they do not support the use of agroforestry or trees to legitimize land claims in the LNP; however, the potential for trees to do so is important to consider.

The first lines of Unruh's *Land dispute resolutions in Mozambique: evidence and institutions of agroforestry technology adoption* read:

Successful adoption of natural resource management technologies requires that important fundamentals of property rights be significantly 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 significantly available, and widely regarded as legitimate. (2002: 1)

According to Brechin *et al.* (2002: 46), "legitimacy refers to any behavior or set of circumstances that society defines as just, correct, or appropriate". To avoid tension, distrust, and conflict, it is important that park residents deem activities and rules which affect their livelihoods as legitimate (Brechin *et al.* 2002). As the making of the transfrontier park has been initiated by external, or non-local, actors, it will be exceedingly difficult for the park to achieve resident legitimacy, particularly if local claims to land are undermined.

I suggest that a means to legitimizing customary claims to land in the LNP, particularly for people who live in the Shigwedzi watershed, could be the identification and mapping of resident burial sites. Notes from the February 27, 2002 community workshop held in Maputo state that potential relocations "would not result in loss of access to cultural sights [*sic*]". Though the definition will need to be made more explicit, I presume that historic burial grounds qualify as these "cultural sites". In the village of Chimangue, Mavasa and I had been told about the existence of historic trees where residents bury their dead. These "ancestor trees" exist in Makandezulu A as well. Makandezulu, the starter of the village, is buried at the ancestor trees and residents go to this place to communicate with the ancestors (the Munyani people) and to offer them Marula or corn beer.

²³ This man is a self-reported tree enthusiast. As Mavasa and I began to speak to him about trees, he leaned in and proudly stated: "I have a passion for planting trees". In addition to a variety of vegetables and herbs, there were approximately twenty mango trees that were no more than two feet tall planted in his yard.

7) With a history of migration and land tenure instability and a future of insecure access to natural resources, would local people benefit from or be threatened by external agroforestry initiatives?

According to Wolmer (2003: 2), “Given the number of competing interests over land in southern Africa it appears somewhat perverse to add a seemingly ‘gratuitous layer of complexity’ by binding states into transboundary conservation agreements.” The observation certainly holds true in Mozambique’s Gaza Province where the creation of national and transfrontier parks may become the newest factor in a series of historical, political, and environmental events that have led to the displacement of the region’s local people. National post-war attempts to reclaim former homelands and to establish homes in new places constitute “the largest reintegration of refugees and displaced persons in the history of Africa” (3). More recently, as private enterprise gained access to the country, both competition for land holdings and resident displacement have increased.²⁴ In the LNP region, the flooding of the Limpopo River in February of 2000 contributed to further dislocation, and in July 2003, several homes in Makandezulu A stood vacant as families fled the area due to drought.

Local access to natural resources in the Limpopo National Park is becoming increasingly insecure; however, despite both the difficulties associated with farming in the historic Coutada 16 and the recent shift in the management regime of this landscape, the residents with whom Mavasa and I spoke, want to remain on their land. As externally driven initiatives may increase (or may be perceived to increase) competition for land and water, adoption of agroforestry practices could threaten (or be perceived to threaten) resident access to natural resources in and around the LNP. *As such, the degree to which externally-driven agroforestry initiatives are successful in securing food and water resources in the Limpopo National Park depends upon the potential for such initiatives to secure resident access to natural resources.*

Externally driven agroforestry initiatives may increase and protect local food and water resources; thus, there is potential for people living in the LNP to benefit from the adoption of introduced agroforestry practices. However, in addition to being aware of the region’s political ecology, introduced agroforestry initiatives need be sensitive to local knowledge, local histories, local land use practices, and local insecurities. Important precursors for the implementation of externally driven agroforestry practices include identifying trees that are culturally salient to LNP residents, recognizing local use and settlement patterns, and clarifying boundaries and resource rights within and around the park.

²⁴ “It is estimated that as of May 1994, 40 million hectares of land, more than half of Mozambique’s total area, have been granted in concessions or ‘sold’ to commercial enterprises. This practice is leading to the emergence of new category of post-war displaced families” (Myers 1994: 603). Myers believes that this estimate is low. Agricultural, joint venture, hunting, mining, tourism, and forestry concessions have been granted. (1994: 610).

Preliminary findings about local knowledge of trees in the LNP are included in the appended tree list. Trees included in this list were mentioned by residents as important for one or more reasons. Trees that are culturally salient to LNP residents include those that are most likely to be depended upon during drought, trees that can survive floods, those that are not cut down when clearing agricultural land and those that are transplanted and propagated. These trees are familiar to some LNP residents and are already part of the park's landscape; therefore, in comparison with other tree species, they have greater potential to be successfully incorporated into agroforestry projects.

That agroforestry initiatives have the potential to conserve water and retain river levels (Patrick Matakala, July 28, 2003: personal communication) would be attractive to residents and managers of the LNP. Water is the limiting factor affecting many agricultural decisions in the LNP. As water becomes scarce and begins to lower or disappear, people farm closer to the source, often planting directly in the river or dam beds. For example, directly adjacent to and within the LNP's Wilderness Enclosure, a number of people from towns throughout the region are farming along the floor of the drying dam. East, along the Limpopo River, residents are planting on the banks of the dry river bed. As the rivers and dams raise, farms, gardens, people, and livestock move. Not only does such seasonal movement of people and farms undermine the practicality of fencing in villages, it informs those wanting to introduce aid programs. To be effective, agroforestry initiatives need be incorporated into this non-static system of regional planting.

Additionally, transformations in the park that result from the change in management regime must be considered. For the most part, scientists, park employees, and implementers spoke highly of the LNP habitat particularly when comparing it to its South African neighbor, the Kruger National Park (KNP). A major factor reported to contribute to the destruction of habitat in the KNP, particularly around boreholes, is the park's elephant population (Grossman, 10/29/2003). While elephant "releases" into the LNP may temporarily decrease population pressure in the KNP, the presence of these destructive animals (Adams and McShane 1992) should be considered when planning for agroforestry projects.

IV. The significance of ethnographic agroforestry research in the Limpopo National Park

Ethnographic agroforestry research in Mozambique's Limpopo National Park began to (1) increase the visibility of residents and resident land use, (2) reveal the role of humans in tree distribution, (3) legitimize resident land use practices as intrinsically conservationist, and (4) provide insight into the history of this landscape. Additionally the research provided preliminary data concerning Shangaan cultural sites, insight into a changing international landscape, and the necessary foundation for ongoing ethnographic research. Herein, I further discuss the first four points mentioned above and propose ideas for further research.

1) Resulting from an apparent lack of high resolution ethnographic research in the LNP, little seems to be known about the people who will be most affected by the creation of national and transfrontier parks in the region.²⁵ Decisions pertaining to the creation of a transfrontier park on the southern African landscape were made at significant distances, both figuratively and literally, from on-the-ground realities. The following is from a preliminary management plan for Coutada 16's incorporation into what would become the Great Limpopo Transfrontier Park. The passage is one of the few sentences in the document that includes observed resident realities: "It is clear from the satellite images that many communities live on the alluvial soils of the Limpopo floodplain. They must have been affected by the floods but seem to have recovered and developed new fields..." (Holden 2001: 11). As these sentences imply, residents of the LNP were barely visible in the initial stages of park implementation, and when local people did come into view, they appear to have been rarely engaged, and their realities became obscured.

2) Decision-making in conventional conservation practice is predominately based on the assumption that ecosystems are static entities subject to perturbation by human action (Escobar 1998; Fairhead and Leach 1998; Cronon 1995; Adams and McShane 1992). Fairhead and Leach, for example, suggested that externally-driven agroforestry initiatives are "constructed (and their funding justified) against a backdrop of decline" (1998: 80). This approach to conservation may reinforce ideas of inevitable human destruction of natural resources and exclude particular human/environment histories (Fairhead and Leach 1998: 80). By contrast, Guyer and Richards suggest that attention

should be paid to building a constituency of local support for conservation, by researching and then emphasizing ways in which human action has already, in some circumstances, served to enhance biodiversity, either by direct protection of valued resources or through triggering ecological processes that have advantages outcomes (1996: 7).

²⁵ This does appear to be changing due, in part, to the work of anthropologists Stuart Miller and Will Norman. Initial planning for the LNP was characterized by a "top-down approach" in which local people were neither informed of nor engaged in park activities (Grossman 10/29/03). Currently, effort is being given to achieving communication with resident populations in the LNP, and community engagement appears to be a priority.

Ethnographic research in the LNP aimed to incorporate Guyer and Richard's landscape approach to conservation. As residents choose to leave drought resistant fruit trees on farmland, they are altering their environment. They are shaping the ecology of the region and creating an anthropogenic landscape.

3) In the LNP context, referring to a local practice as “agroforestry” implies that the activity is an historical management technique; thus the naming of the process becomes a political action. In a reference to Indonesia, Li (1996) discussed the power of naming things when she wrote, “the quasi-technical term ‘agro forestry’...offered a framework for thinking about existing and potential crop combinations and cultivation cycles (including burns and fallows) as something other than chaos and destruction” (Li 1996: 518). In Li's example, as in this preliminary LNP research, agricultural techniques were given a framework through which they became visible as conservation management practices.

4) Research on regional land use and history is, perhaps, particularly important in locations characterized by insecure claims to natural resources. When combined with local memories, trees and farmland became evidence of the ecological and political past. For example, on our first full day in the LNP, Mavasa and I walked to the dam near Mavodze to find where the women were farming. Set back from the road, we noticed a large overgrown plot of land where the mopane and acacia trees had grown back a few feet. Upon returning to the plot with Mavodze residents, Mavasa and I asked about the history of the plot. While I had hypothesized that the land had been abandoned following the recent flooding, we learned that, during the Renamo/ Frelimo war, the area once served as a hiding place for women and children. Local women lived together, farmed, and kept cattle on the land while local men hid in the bush and attempted to distract soldiers from the hideout. The plot of land had not been used since the war.

Preliminary ethnographic data revealed that the current state of the Limpopo National Park is a product of history, of, among other factors, war, drought, flooding, agriculture, hunting, lack of infrastructure, and conventional notions of conservation and economic development. However, a look at the 2002 Peace Park Foundation map, among the most current and informative representations of the LNP available, reveals little about the historical realities of this landscape such that presumably limited alterations would be necessary if residents were removed from the park. Maps are primary tools for the management of landscapes; however, in many respects, they fail to adequately represent these landscapes, in that, for example, they may fail to represent people, history, and local notions of land tenure. In regards to visualization methods, Brosius and Russell (2003) suggest a “relationship between the political and the technical that must be acknowledged.” In the Mozambican context, the lack of visibility obtained by local people may contribute to resident struggles to gain meaningful representation and participation in the park implementation process.

In the LNP context, those in positions of national and international power seem to view the landscape as an economic asset needing protection from local farming practices so

that the land can be developed into a game reserve and tourist destination. To achieve this, local people may be relocated to fenced-in villages within the park or removed from the park all together. Scott (1998) described the ways in which states perceive land and people as powerful management tools. Scott's discussion of legibility asserts that state representations of societies are created at a distance from on-the-ground realities; thus they are simplified versions of society, which enable states to manage lands according to particular agendas (Scott 1998; Brosius *et al.* 1997). Essential to the concept of legibility are not only those realities on which states focus, but also those that states obscure or fail to see (Dove, personal communication, 10/1/ 2003).

Issues related to local participation in conservation remain at the forefront of academic, institutional, State, and local discussions about conservation and development. At the conference entitled *Defining Success in Conservation* held at the University of Georgia, Brosius suggested that resistance to global homogeneity was the first of five potential points of agreement for those interested in both conservation and development (10/11/ 2003). Dove responded that a commitment to history may contribute to achieving such resistance (10/11/ 2003). As local participation becomes prioritized in the LNP implementation process, knowledge of the region's historical context will become increasingly important to achieving both biological and cultural diversity.

Future research in the Great Limpopo Transfrontier Park aims to increase the visibility of history in the LNP, to consider means through which history may be incorporated into the transfrontier park implementation process, and to contribute to resisting notions of temporal homogeneity regarding land and community. While local notions of land tenure in the LNP are characterized by a history of access to natural resources, ethnographic findings imply that displacement and movement are a part of local history. I suggest that the history of resident mobility in the LNP may complicate both park and State understandings of local land tenure and, as a result, undermine local resource claims. As such, research focusing on identifying and mapping "ancestor trees" may legitimize resident access to natural resources²⁶.

Dove (1995: 65) wrote, "The relationship between farmer and tree is comprehensible only if the scope of analysis is extended beyond the farmer and the tree. The analysis must extend to history." Within the context of my ongoing research, Dove's assertion is extended to landscapes, such that farms and parks, as part of the larger cultural terrain in which they are developed, are understood within their historical and processual contexts. While preliminary research suggests that local histories were either invisible or obscured in the early stages of park implementation process, preliminary research also suggests that as community participation becomes prioritized, local people become visible on the LNP landscape. As including local history, local notions of land tenure, and local land use practices changes the momentum of the park implementation process, it is likely to be

²⁶ The Shangaan people buried at these sites were mine workers, employees of Kruger National Park, refugees, and victims of war, drought, and, flood; as such, they are the park's history. The sites are personal and sacred to local people; therefore, there are clear ethical concerns which need be addressed before initiating such a project.

met with some resistance; however, incorporation may also present more equitable alternatives for park and resident resource tenure.

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