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The political ecology of recovery from armed conflict: the case of landmines in Mozambique

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Abstract

The devastation wrought by landmines on local populations is well known. However, the broader effects of mine presence on postwar recovery, and the progress of a ‘peace process’, remain largely unexamined. Both the academic and the practitioner literature regarding landmines lack a framework within which the mix of economic, political, social, agricultural, and ecological repercussions of mine presence in a context of postwar recovery can be investigated. Here, we consider the utility of political ecology to examine the influence of landmine presence on the socioecological relations important to postwar recovery in Mozambique. Landmines constitute the primary obstacle to the reconstruction and development in Mozambique. Because mine presence influences different aspects of recovery differently, we have selected three cases in the country where mine presence has impacted important components of recovery: agriculture, transportation corridors, and international investment. Peace process and recovery efforts by the international community do not presently address the broader, non-medical influences of landmine presence on recovery, and it is the intention of this article to contribute to an initial examination of these issues.

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Introduction

The debilitating effects of landmines during and subsequent to periods of armed conflict have received much in the way of world attention (e.g., Roberts & Williams, 1995). Less examined are the political–ecological dimensions of landmines involving number, location, and strategy of mine-laying, and the influence this has on a broader postwar recovery—in particular, the reconstitution of legitimate, spatially relevant social and physical infrastructure important to a peace process. The quantity and spatial pattern of landmine presence has a wider impact than just the immediate physical consequences inflicted on the military and civilian populations during and after periods of armed conflict. Because the primary purpose of landmine use in the developing world is to cause and maintain avoidance and abandonment of certain land uses among a population during wartime, the translation of this effect during recovery from war has significant political–ecological repercussions (APHRQ/PHR, 1993).

To date, three themes dominate our understanding of the issues brought about by landmine use: (1) the medical repercussions of mine accidents (e.g., Ascherio et al., 1995; Day, 1998; Meade & Mirocha, 2000; Muzaffar et al., 2000); (2) technical aspects related to the removal of mines (e.g., Bruschini et al., 1998; Herman, 2000; Mather, 2002; Won et al., 2001); and (3) attention to the international ban on landmine manufacturing, marketing, and use (e.g., Anderson, 2000; Baxter, 1997; Malanczuk, 2000; Thakur & Maley, 1999). While these valuable efforts have contributed much to our understanding and concern regarding landmines, there exists a critical need to consider the spatial effects of landmines on processes of national recovery from conflicts where mine presence is a significant feature. Specifically, there is a need to examine the broader socioecological relations that are disrupted by landmine presence, and how recovery processes intersect with this presence in different contexts and at different scales. Current peace process efforts pursued by the international community do not include approaches to manage the political–ecological repercussions of landmine presence in recovery scenarios, and as a result, opportunities to pursue relevant recovery strategies go unrealized.

Much of the literature on postwar recovery issues is scattered into different practitioner and academic fields. The ‘practitioner’ literature deals with issues of policy and logistics for demobilization and re-integration (e.g., Colletta, Kostner, & Wiederhofer, 1996; Damrosch, 1989; Smock, 1993), and peacekeeping and peacemaking (e.g., Hampson, 1996; United Nations, 1995, 1996; West, 1997). These largely atheoretical efforts have contributed to the understanding of case studies and logistical alternatives for recovery and peacemaking, but lack a cohesive framework for analysis. On the other hand, much of the academic literature on postwar recovery deals with the broad issues of politics and history, primarily at the state level (e.g., Bratt, 1997; Chopra, 1996; Crocker & Hampson, 1996; Krznaric, 1997; Soto & Castiillo, 1995). What is needed is a framework within which specific analyses of postwar recovery, such as those related to landmine issues can be examined. Political ecology, with its ability to analyze scales and actors, may offer such a potential framework. Political ecology has demonstrated considerable potential in

being able to bridge the gap between practice and theory due to its emphasis on historically embedded processes that contribute to a set of socioecological relations (e.g., Bryant, 1992; Bryant & Bailey, 1997; Horowitz, 1990; Watts, 2000). The focus here is on the status of those relations within postwar scenarios. The paper examines three settings of landmine presence in postwar Mozambique. The settings reveal the scales at which landmines disrupt different spatially explicit socioecological complexes that are important to recovery.

Important in this analysis is the reality that landmines are used in specific ways in Third World contexts. While traditional landmine use primarily focuses on defensive purposes and route denial, in the developing world, they are used as an offensive weapon. This is because the relative lack of resources that characterize insurgent groups, militaries, and militias mean that combatants need to provide for themselves by obtaining what they can from local farms and fields while on the march. More developed countries have the means and capacity to maintain supply lines to their troops. In this regard, an important objective in mine-laying is to deny access to land-based resources by both farmers and one's opponents, thus denying food supplies to the enemy. Of course, as lines of control move back and forth across the landscape during the course of a conflict, waves of mine-laying over large areas can take place with little or no record keeping. Additionally, by taking resources 'hostage' through the presence of landmines, warring groups can exert significant influence on each other's ability to fulfill their economic needs. And, the general social disruption associated with landmine presence can be advantageous for a variety of reasons to both sides involved in a conflict, and as a result can encourage the further use of mines (Ascherio et al., 1995).

Mozambique provides an important opportunity to investigate the influence of landmines on recovery because both the FRELIMO government and the RENAMO insurgency utilized mines extensively to meet offensive objectives. Besides, the time that has elapsed since the country's peace accord in 1992 has allowed specific trends to become observable in the country's recovery. Mozambique's experience with postwar recovery is shared to a significant degree by other countries where mines are pervasive. Afghanistan, Angola, Cambodia, Vietnam, Bosnia/Herzegovina, Ethiopia, Eritrea, and Somalia are all dealing with how landmines and their effects on recovery are best managed. Our attempt here is to contribute to the development of a framework useful for this management.

Following a discussion of aspects of political ecology that contribute to understanding landmines in the context of postwar recovery within Mozambique, the paper briefly reviews the civil conflict that occurred in the country between 1977 and 1992. The specific objectives, strategies, and resulting uses of mines by both government and rebel forces is then discussed, followed by an examination of three case studies in which mines played different roles. The paper concludes with a discussion of the political-ecological effects that landmines have had on recovery within these different contexts. While this investigation attempts to highlight important historical and empirical information to aid in the understanding of specific influences mines have on postconflict recovery in Mozambique, it is hoped

that the approach can at the same time contribute to the development and utility of political ecology.

Political ecology, scale, and landmines

The ability of political ecology to address a wide range of complex phenomena that embody the environmental and social interactions is of particular value when applied to the problem of landmines in postwar recovery. [Blaikie and Brookfield \(1987: p. 17\)](#) note that, “‘political ecology’ combines the concerns of ecology and a broadly defined political economy. Together this encompasses the constantly shifting dialectic between society and land-based resources, and also within classes and groups within society itself”. In this regard, the key issues for landmine presence in postwar recovery are: (1) the relationship between political economy and the environment; (2) the relationships between a variety of actors; (3) how these relationships operate at different spatial scales; and (4) more broadly, the social production of nature. These issues have been used to examine other spatial problems such as desertification ([Horowitz, 1990](#)), deforestation ([Bryant, 1997](#); [Hecht & Cockburn, 1990](#); [Peluso, 1992](#)), soil erosion ([Blaikie, 1985](#); [Blaikie & Brookfield, 1987](#)), famine ([Watts, 1983](#)), and the decline of pastoralism ([Cliffe & Moorsom, 1979](#); [Hedlund, 1979](#)).

While issues of ‘conflict’ are common within political ecology, there has been very little research that explicitly focuses on armed conflict. [Le Billion \(2001: p. 580\)](#) notes that, ‘[a]rmed conflicts and natural resources can be directly related in two main ways: armed conflicts motivated by the control of resources, and resources integrated into the financing of armed conflicts’. While this can broadly be the case, a more useful concept analytically for examining the role of landmines in recovery is how societies ‘remake nature’ ([Castree, 2001](#)). The notion that societies intentionally and unintentionally ‘physically reconstitute’ nature is a substantial deviation from the more traditional concepts that societies merely ‘physically engage’ nature ([Castree, 2001: p. 15](#); also [Smith, 1984](#)). Along these lines, landmines reconstitute the natural landscape because a primary objective is the purposeful disruption of access to land-based resources due to the threat of violent consequences. This then results in large abandoned agricultural areas that return to bush and forest, while unmined agricultural areas become degraded due to overpopulation. This is a different kind of natural resource–conflict relationship than that is discussed in most of political ecology.

The role of scale is one of the more important aspects of political ecology ([Bryant & Bailey, 1997](#)), and is also useful to the landmines problem. [Swyngedouw \(1997: p. 144\)](#) suggests:

The observation that life is sociospatially constituted does not in itself give or assign priority to a given geographical scale. The sociospatial structuring of everyday life does not itself offer the local, the global, or any other scale as the

preeminent site for analysis... The role of particular geographical scales, their articulation and interpenetration has to be theorized...

Although landmines disrupt a wide range of economic, political, social and ecological relations within and beyond the regions where they are located, by attempting to delineate scales of observation, specific scenarios can be isolated in an attempt to understand better the broader implications of landmine presence on recovery. As Swyngedouw (in press) suggests, '[s]truggling for command over a particular scale in a given sociospatial conjuncture can be of eminent importance. Spatial scales are never fixed, but are perpetually redefined, contested and restructured in terms of their extent, content, relative importance and interrelations'. How scales are contested and restructured is important both from the perspective of using landmines, and understanding their effects. This is because mines can be used to redefine the socionatural relations at different spatial scales. (Bryant, 1992: p. 23) observes:

In understanding the contemporary dynamics of conflict... a spatial distinction should be drawn between actors at or near the conflict site, and those elsewhere at regional, national, or international centers. How may this pattern influence the nature and outcome of struggle, and be reflected in coalitions amongst actors? How are coalitions constructed? What impact does the spatial fragmentation of 'contextual' actors, the state and TNCs [transnational corporations], have on location-specific conflict?

Due to the fluid nature of armed conflict and recovery from conflict, the point here is less about the particular scalar scenarios and how these contribute to the remaking of socionatural conditions, and more about the recognition that the landmine use forces different possible relations between the society and its natural resources. Along these lines, Castree and Braun (1998: p. 5) suggest that 'the remaking of nature(s) has wider implications—it becomes, quite simply, a focal point for a nexus of political economic relations, social identities, cultural orderings, and political aspirations of all kinds'. Several different ways in which nature is remade via landmine use will be discussed in the following sections.

Methodological approach

Information for this analysis was gathered from several sources. These include dissertation field research involving a 521 household survey in Mozambique over the course of a year and a half (Unruh, 1997a), and numerous United Nations and US Agency for International Development (USAID) documents. Additionally, a geographic information system (GIS) was created with socioeconomic, population, land use, and landmine data from (UNOHAC, 1994a, b) in order to assess the spatial relationships that exist between these. Castree and Braun (1998: p. 5) suggest that such a 'mixed method approach' is appropriate to investigating particular phenomenon that otherwise lack adequately detailed data, such as the very fluid

and data poor circumstances in war and recovery from war (also, Brewer & Hunter, 1989; Rocheleau, 1995; Winchester, 1999).

Mozambique: background

The recent 16-year civil war in Mozambique (Fig. 1) dislocated approximately six million people from land resources to which they are now returning and re-claiming, comprising the largest return and re-integration of refugees and displaced persons in the history of Africa (USCR, 1993). The war inflicted between 16 and 18 billion dollars worth of damage in a country where the GNP was less than two billion, with the country relying almost exclusively on foreign assistance at the time (Willett, 1995). The US Committee for Refugees has estimated that Mozambicans must struggle for a full generation before their country can regain the impoverished standard of living it held in 1980 (USCR, 1993).

The history of the war began with the end of the Portuguese colonial government in 1975. The rebel group, Frente de Libertacao de Mocambique (FRELIMO), forced the Portuguese out of Mozambique through guerilla warfare that began in the late 1960s (Nordstrom, 1997; Vines, 1991). As FRELIMO fought the Portuguese, the group fractured, and one component became the Resistencia Nacional Mocambicana (RENAMO) in the late 1970s with the help of the regional, political and economic interests of Rhodesia and South Africa (Anderson, 1992; Bowen, 2000; Stiff, 1999).

The Rhodesian government supported RENAMO in an effort to destabilize Mozambique's African controlled government (Finnegan, 1992; Hall & Young, 1997). Rhodesia was concerned with its increasing isolation by its neighbors, and Mozambique's move to limit Rhodesia's access to Mozambican ports was in protest to Rhodesia's white minority led government (Hall & Young, 1997; Minter, 1994). During this time, the Rhodesian government fought its own civil war, which led to democratic elections in 1980. With these elections, Rhodesia's (now Zimbabwe) first black majority government was elected. This was problematic for RENAMO because Rhodesia provided a base of operations, weapons, and technical support (Vines, 1996).

With the fall of Rhodesia, RENAMO turned to South Africa for support. South Africa had an interest in destabilizing Mozambique for many of the same reasons as Rhodesia. In 1980, the white minority government in South Africa anticipated problems resulting from a situation in which they were increasingly surrounded by hostile neighbors. A destabilized Mozambique allowed them to maintain their political and economic hegemony over the region (Stiff, 1999; Vines, 1994). This was a different interest from that of Rhodesia's, and affected how different groups deployed landmines. South Africa's interest in the disruption of the economic activity within the country was of paramount importance when it came to developing war operations. Although systematic use of landmines in Mozambique occurred as far back as 1965 in the conflict between the Portuguese and FRELIMO, FRELIMO and RENAMO laid the majority of landmines between 1978 and 1990

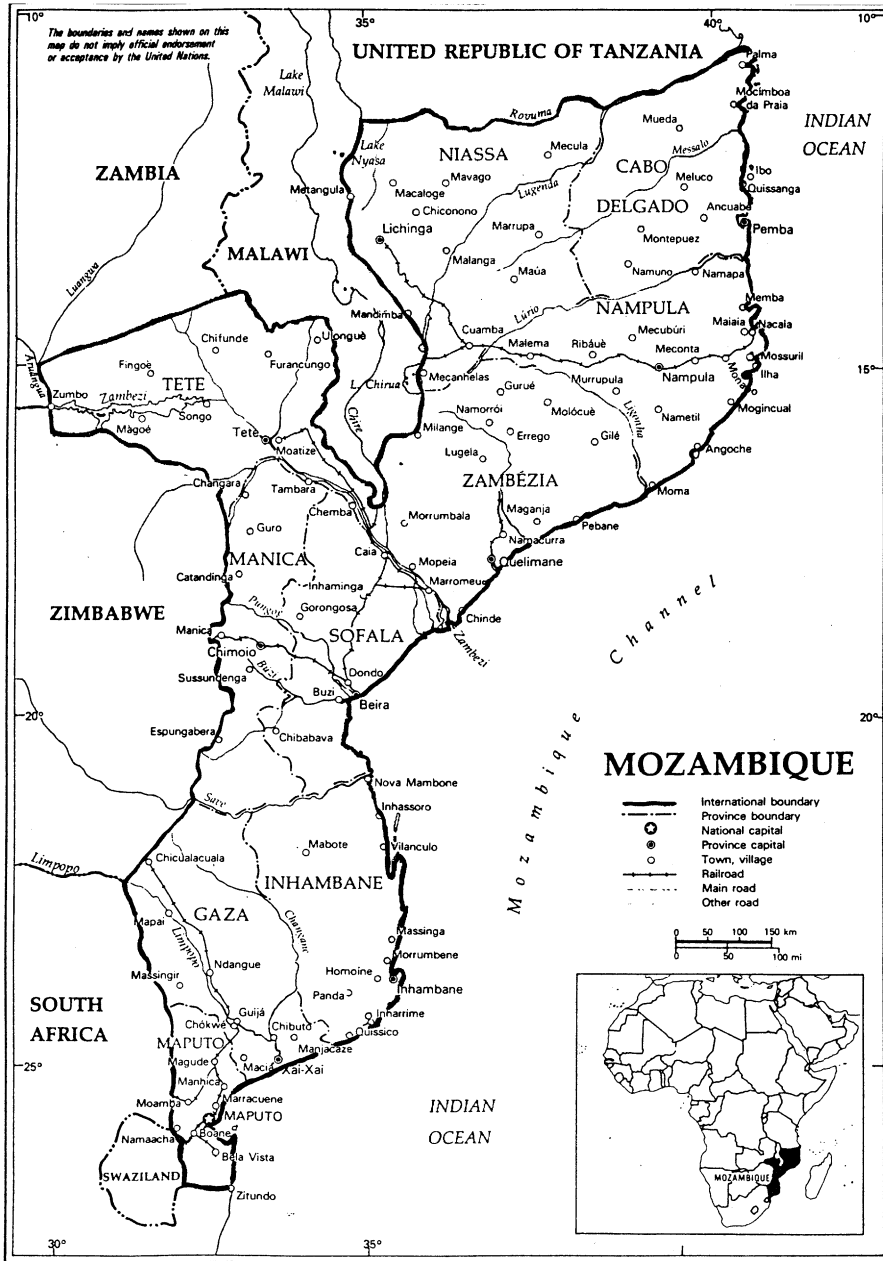


Fig. 1. The provinces of Mozambique. Source: United Nations Map No. 3438.

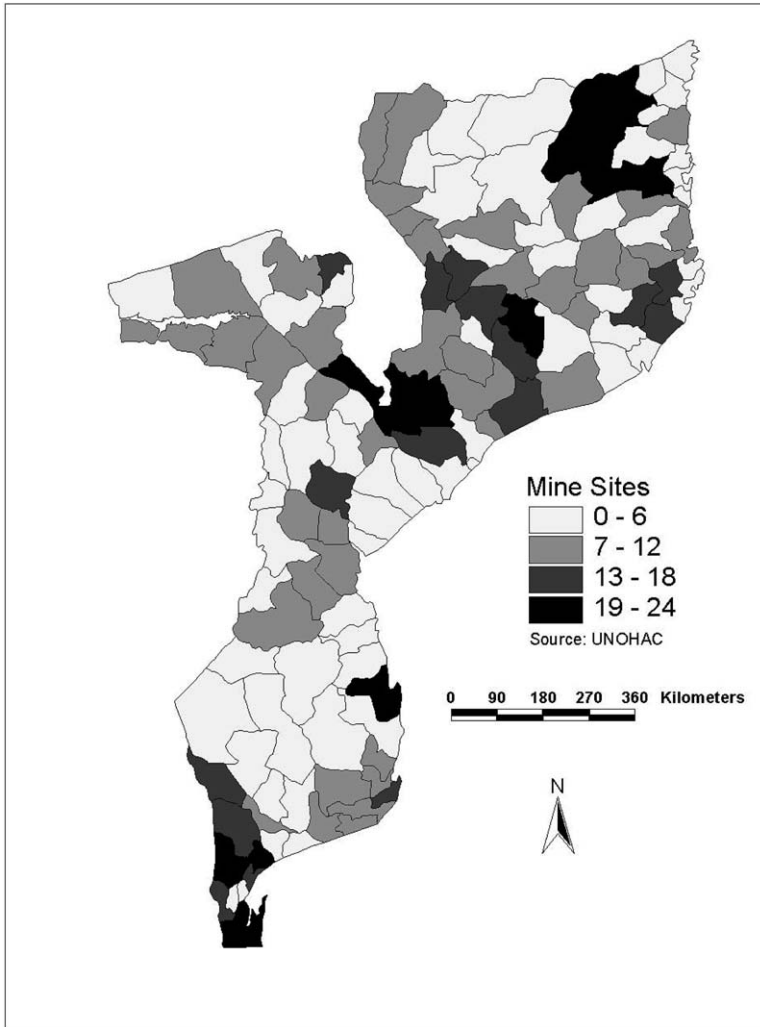


Fig. 2. The spatial distribution of landmine sites. Source: UNOHAC (1994a).

(Vines, 1997). Many tactics, including the random deployment of mines and the deliberate targeting of civilian populations, were in direct violation of international law (Vines, 1994). The distribution of mines was not mapped by either the FRELIMO or the RENAMO, and has been a tremendous obstacle to recovery. The UN has subsequently attempted to map the estimated landmine densities at the district level (Fig. 2).

Because of the need to protect their land-based interests from the RENAMO insurgency, FRELIMO also used landmines for defensive purposes. In many cases, initial mine fields were laid around strategic installations, but often these proved

inadequate against attacks. Hence, FRELIMO in many cases continued to add to sites until large areas extending well beyond the immediate perimeter of installations were protected. In doing so, they often disrupted a host of land uses. This was particularly devastating to smallholder agricultural land as well as important transportation routes. As part of a larger-scale strategy, FRELIMO laid many mines along its border with South Africa during the 1980s fearing increased collaboration between RENAMO and South African forces (Vines, 1994).

Alternatively, RENAMO laid mines primarily in an attempt to devastate the government's economy and to create a general sense of chaos. While the South African defense forces assisted in RENAMO's mine-laying in the late 1970s and early 1980s, RENAMO forces increasingly chose their own targets after 1985. In an attempt to maximize their efforts, RENAMO employed specific strategies geared toward disabling the FRELIMO government's ability to operate and control the countryside. RENAMO frequently mined commonly used roads in order to slow and divert troop movement, as well as to stop deliveries of military goods and transport of agricultural produce. In order to attack troops directly, RENAMO laid mines in large rural tracts that were used for troop movement and food collection and production. Airfields used by the government were also mined in order to further prevent the movement of people and goods. Currently, landmine presence in the country is considered to be the primary challenge to reconstruction and development (Ascherio et al., 1995; Mather, 2002), despite more than a decade of humanitarian demining (Mather, 2002).

Three settings of landmine presence in postwar Mozambique

The different strategies and effects of landmine placement in Mozambique present the opportunity to investigate a variety of topics important to recovery. Here, we consider: (1) the case of the country's breadbasket; (2) important transportation corridors; and (3) the role of a transnational corporation. These settings are located in some of the most densely mined areas of the country. Differentiation into these three cases is not meant to capture the totality of landmine political ecology in Mozambique. Rather, the intention is to provide a few examples of a number of possible constructs, for the purpose of contributing to a broader and more comprehensive understanding of the influence of landmines on a country recovering from armed conflict.

Nampula and Zambezia provinces: the breadbasket

Agronomically endowed areas play a large role in countries recovering from armed conflict, through the provision of food to the rest of the country and associated export opportunities (Unruh, 1995). In Mozambique, the provinces of Zambezia and Nampula (Fig. 1) are the country's most fertile and populated agricultural areas and are regarded as the breadbasket for much of the nation (Minter, 1994; Unruh, 2002). Much of the population of these provinces however survived on food aid during the war (Minter, 1994) as the scale of the reduction in

Mozambique Land Conflicts: 1993

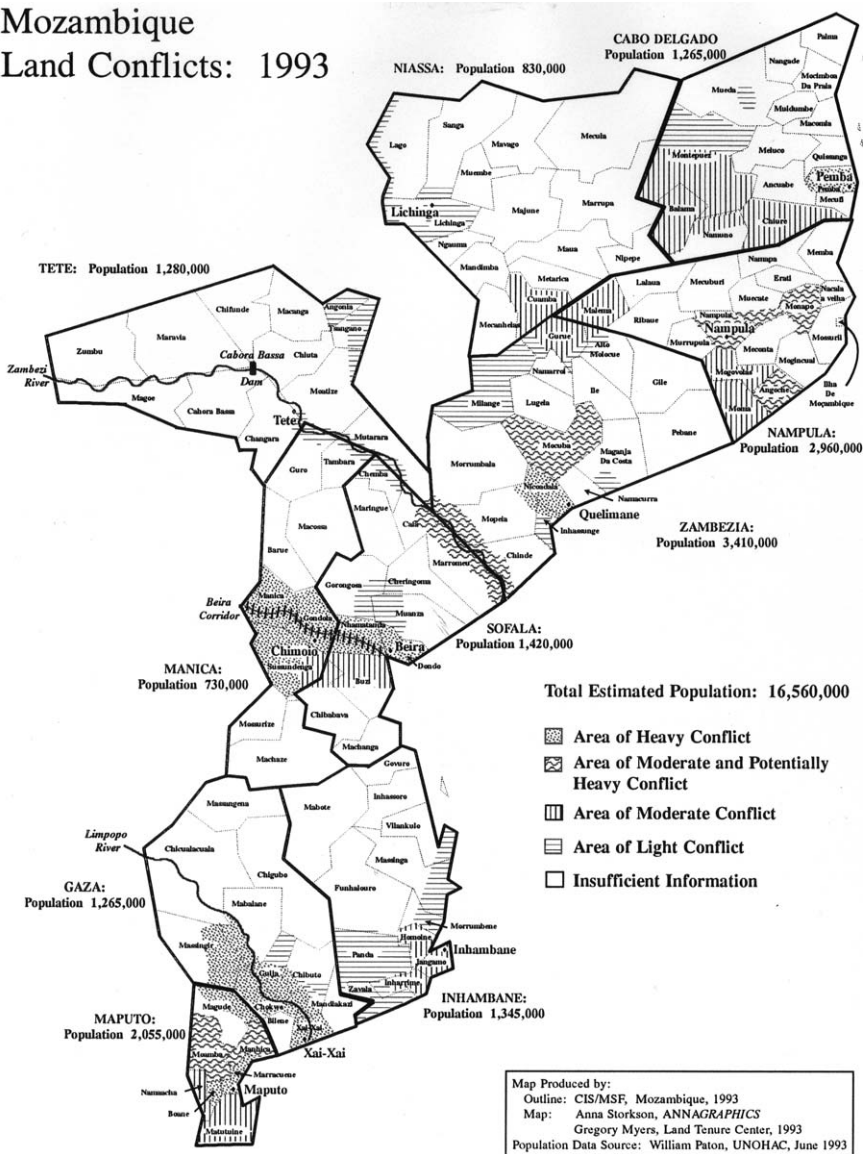


Fig. 3. Mozambique Land Conflicts, 1993. Source: Land Tenure Center.

food production, damage to infrastructure, and the resulting inaccessibility, converted the provinces from food producing to food deficit areas (Hanlon, 1991). RENAMO's control of food and agricultural production resulted in significant malnutrition in these provinces, despite some occurrences of locally good harvests (Hanlon, 1991). Prior to the onset of the RENAMO conflict, Zambezia was a

major cash crop producer with more than half of the national agricultural exports originating in the province (Hanlon, 1991). Heavy combat in these provinces however led to a significant dislocation, resulting in the highest concentration of dislocatees in the country, with wider repercussions for food security (Hanlon, 1991). More than half of the local population in Zambezia fled their homes during the war, and most of the abandoned agricultural land reverted to bush (Minter, 1994).

Large areas of prime agricultural land in these two provinces have remained uninhabitable or problematic for long periods due to mines (Ascherio et al., 1995; Hanlon, 1995; McGregor, 1995; UNOHAC, 1994a, b). One study estimates that as many as 500,000 landmines exist primarily in the most fertile areas (HRWAP, 1994). At the same time, rural households have been attempting to expand areas under cultivation after the war with each successive season, as farmers attempt to bring areas long under fallow due to war back into cultivation (USAID, 1996), increasing the likelihood of mine encounters. As a result, land access remains one of the most fraught issues in Mozambique, and landmines play a significant role in determining access (Mather, 2002; Unruh, 2001).

Subsequent to the end of the conflict, problematic recovery patterns emerged that appear to be connected to the pattern of landmine presence in the two provinces. Data overlays in the GIS for the present work reveal that heavy concentrations of dislocatees correlate positively with landmine sites, suggesting that localized non-mined locations within mined areas attracted the dislocatees. Besides, there appears to be a corridor of spatial coincidence in mid-Zambezia of mines and, land conflict, demobilized combatants and dependents, and dislocatees, revealing an area of significant ongoing contention. In both Nampula and Zambezia, RENAMO won postwar elections (Vines, 1996). However, the relatively low administrative capacity of RENAMO has had repercussions on landmine clearing, and hence recovery of agricultural areas. While most of both the provinces were moderately to heavily mined (UNOHAC, 1994), there has been some UN mine clearing, and more districts have undergone some form of clearing than have not (United Nations System in Mozambique, 2002).

The broad spatial patterning of the intersection between presence and/or perceived presence of landmines, and the smallholder agricultural endeavor, has resulted in some agricultural areas becoming degraded due to overcrowding and overcultivation, while the others remain abandoned. This has resulted in a substantial change in population and land use and land tenure patterns (Unruh, 1997a). These changes influence agricultural production, and the subsequent food security of both the rural and urban populations.

In such an environment, the presence of mines will greatly aggravate competition for unmined land and increase the number of land disputes (Fig. 3). The resulting situation then embraces a number of difficulties. Because customary dispute resolution mechanisms in these provinces, like most of Mozambique, are community-based, non-local smallholders (migrants, dislocatees, and demobilized combatants) are not members of local communities and generally do not adhere to local customary tenure systems nor abide by local decisions regarding land disputes (Unruh, 1998). Likewise, local long-established smallholder communities in a

number of areas in Nampula and Zambezia that were inundated with migrants arriving from mined locations soon came to the conclusion that their own community structures regarding land tenure had unraveled to a significant degree due to the large number of non-participants—decreasing their own confidence (and hence participation) in their customary resolution of land disputes, especially with regard to non-locals (Unruh, 1997b). This, coupled with large mine-free areas taken over by commercial interests, and the absence of dispute resolution mechanisms between these interests and all smallholders, created a situation where opportunities for legitimate dispute resolution over agricultural lands are greatly reduced, and competition and confrontation over land are greatly increased (Unruh, 2001).

While the breadbasket case in Mozambique on the surface appears to be an explicitly localized scenario affecting local actors (in-place smallholders, migrants, dislocatees, demobilized combatants), the processes affected by landmine presence clearly have influence on the larger spatial scales. Thus while mines may force a localized population to relocate, they can have impacts on food security for the country as these two provinces have historically been responsible for a large portion of Mozambican agricultural productivity. This, combined with the takeover of large tracts of land by other actors such as TNCs, and the absence of effective local to national institutions to regulate and arbitrate land rights, contributed to decreasing food security at the state level. Besides, food insecurity and dislocation due to changing social conditions and unstable land tenure regimes in some cases resulted in instability as small holders migrated to other locations, contributing to land conflicts in the destination areas (Unruh, 1997a).

Beira and Zambezia transportation corridors

Infrastructure corridors play an important role in economic recovery from periods of armed conflict. Essential to import, export, marketing, and transport activities, corridors link people, equipment, agricultural produce, and commodities, and are of particular importance to developing countries. In Mozambique, there are two primary corridors. One corridor runs along the Zambezi river, through Tete Province from the Cahora Bassa dam to the coast (Fig. 3). The other is the Beira corridor, which comprises road, rail, and oil lines from the town of Beira (Sofala Province) to landlocked Zimbabwe at Manica Province (Fig. 3). During the course of the war, there were significant attempts by FRELIMO to protect these corridors. However, the length of the corridors and problems defining their width made this difficult. Hume (1994) has noted the spatial problems associated with these corridors, in that difficult decisions were needed as to whether to defend the large agricultural and population areas that bordered the corridors, or only the transportation infrastructure. The Beira corridor was a primary target by RENAMO during the war and was regarded as significantly disrupted and dangerous (Hanlon, 1991). Attacks along the Beira corridor were such that it was the central posting of Zimbabwean troops sent to assist FRELIMO during the war (Vines, 1996). Minter (1994) discusses the problems created by attacks on the corridors, and the resulting shortages of electricity and water in Beira, and the difficulties of agriculture and

fuelwood collection along the corridor due to fear of RENAMO attacks. These corridors were considered so important to Mozambique's functioning that they were singled out as primary points in the ceasefire and peace accord (Unruh, 1997a; Vines, 1996). And after the war, the rehabilitation of the Beira corridor in particular was seen as a priority (Hanlon, 1991).

Mine-laying strategies by RENAMO along the corridors were primarily for purposes of route denial, ambush for obtaining goods, and disruption of commodity transport. Besides, RENAMO used antitank mines for the purpose of vehicular destruction along the rail and roadway parts of the corridors (HRWAP, 1994). FRELIMO also employed landmines along the corridors so as to protect particular installations (HRWAP, 1994). As in other locations in Mozambique, record keeping with regard to landmine-laying was non-existent, such that multiple, overlapping waves of mine-laying took place in certain areas along the corridors. RENAMO's intent in focusing on the corridors for mining and battlefield advantage was to create a chokehold on transport of goods, equipment, weapons, food, food aid, and people.

For actors such as smallholders, the value of the corridors existed in the proximity of fertile land to transportation, and the prospect for security services (including food aid) that troop presence and transport infrastructure offered. These made areas along the corridors magnets for dislocatees during the war, and for demobilized combatants and additional dislocatees subsequent to the war (Unruh, 1997a). In particular, heavy concentrations of refugees were noted at the Zimbabwean end of the Beira corridor as many Mozambicans fled the country along the road and railway (Hughes, 1999).

Thus, the situation along the corridors was one of significant confusion on the part of smallholders arriving from elsewhere. The perception of military presence and therefore safety along the corridors was frequently compromised by the heavy presence of mines (Unruh, 1997a). This resulted in additional confusion, competition, and confrontation over locations thought to be free of mines and safe from attack (Unruh, 1997a). The possibility of being able to transport agricultural produce to the market led to large populations of smallholders attempting agriculture along the corridors, which together with areas taken out of occupation and agriculture due to mine presence, created the prospect of numerous land conflicts in areas perceived to be mine-free (Fig. 3). Both the Zambezi and Beira corridors correlate spatially with concentrations of land conflicts (Fig. 3). At present, significant landmine clearing has been reported along the Beira corridor, with all districts along the corridor having received some clearing during the peace process (United Nations System in Mozambique, 2002). However, because no records were kept regarding where the mines were laid, confidence that areas are in fact cleared can frequently be low. Mather (2002) articulates the significant problems in demining activities in this regard.

Other forms of corridors are likewise of considerable importance to postwar recovery. Corridors linking urban areas to ports, other urban areas, or linking urban or rural areas between countries are also valuable to a recovering economy. The capital Maputo is an example of this, where physical links between this

administrative and economic center (including the primary port), to South Africa, Zimbabwe, and other parts of Mozambique were important field objectives during the war, as was the rehabilitation after the war. While Maputo itself was not mined, there was considerable landmine presence in a rough ring around certain parts of the city. Some of this may have included defensive mining by FRELIMO, particularly of installations and key infrastructure. Every district in Maputo province with the exception of Maputo district was moderately to heavily mined (UNOHAC, 1994a). These included some of the most heavily populated areas of the country (UNOHAC, 1994b).

The transportation corridors and the purposes they serve bring specific challenges to the ongoing recovery in Mozambique. Operating primarily at the regional (sub-national) scale, corridors engage smallholders as refugees, farmers, migrants, and dislocatees as important actors, along with organizations that operate transport services, the military presence, donors, state agencies, and TNCs. Landmines proximate to corridors complicate the pull of people toward these locations for perceived economic and social benefits (Finnegan, 1992). After the war, damage to the corridors meant that food security over wide areas was compromised as surpluses and food aid encountered transport difficulties (UN Report on Mozambique, 1996). Also during and subsequent to the conflict small- and medium-scale agriculturists found themselves competing with state agencies and TNCs for access to land around the corridors.

Cabo Delgado—transnational corporation

Calls for outside investment in recovering countries are particularly acute in postwar scenarios, because investment is seen as a much needed boost to damaged economies (Hanlon, 1991). In this regard, how investment activities intersect with mined landscapes is important to the success of investment in postwar economies, and can significantly influence local populations.

We examine here the case of large-scale agribusiness activity in Cabo Delgado province (Fig. 1), historically a location of transnational corporation activity, including sugar mills and large-scale cotton projects (Hanlon, 1991). The reality of operating in postwar situations can prove overwhelming for many attempts at investment. Problems such as landmines and other security issues can scare off investors, and alter the ability to operate for those who do invest (Hanlon, 1991). There are however particular investments that are able to get around the problems of operating in postwar situations.

In Mozambique, LOMACO, a subsidiary of LonRho, facilitated its presence in Cabo Delgado by dealing with both RENAMO and FRELIMO during and after the war, in order to secure the necessary lands for cotton production. LonRho is a Britain-based corporation that had extensive agricultural, mining, and infrastructure interests in Mozambique (Hume, 1994), and was the largest single investor in the agricultural sector at the close of the war (Finnegan, 1992). As a result, the intersection of mined areas and priorities for LOMACO's operations is complicated. While LOMACO needed fields and roads for growing and exporting cotton,

battlefield priorities for government and opposition troops with regard to mine-laying did not always intersect well with agreements made between LOMACO and the two opposing forces. Thus, while the approach adopted by LOMACO as an investor to work around the various negative impacts of war may have worked to a degree, the realities of low capacity command structures within the opposing sides made predictability difficult (Vines, 1991). In order to take proactive measures, LOMACO hired both defense forces from nearby residents, and defensively laid mines around their areas of operation to protect the land from destruction (Finnegan, 1992; Vines, 1991). The location of LOMACO's activities in the province (Montepuez district) was one of the most mined districts in the country (UNOHAC, 1994a). Most of the mined areas in the province did not receive any mine clearance as of 2001 (United Nations System in Mozambique, 2002) and no clearance had occurred in Montepuez. Whether this indicates a successful ability on LOMACO's part to work around, or know the locations of, or otherwise manage the landmine risk is not known. However, LOMACO both during and after the war was able to continue cotton production activities despite little or no mine clearance in their areas.

While foreign investment in postwar situations does require particular arrangements, it can under certain conditions combine with the repercussions of armed conflict and recovery to create difficulties. The presence of landmines in Cabo Delgado (as elsewhere in the country) significantly restricted available agricultural land for small-scale farming activities (Unruh, 1997a). This, together with the presence in Cabo Delgado of large numbers of demobilized combatants and dislocatees (UNOHAC, 1994b), meant that conflicts over mine-free land between smallholders, and between smallholders and LOMACO became significant problems (Land Tenure Center, 1993). LOMACO's cotton operation, while needing laborers, could not absorb the large numbers of people moving through the area.

Land access in agronomically endowed areas is at a premium in postwar situations (Unruh, 1995). With investors, demobilized combatants, refugees, dislocatees, and local communities all attempting to access in many cases the same lands, there is significant opportunity for problematic and even volatile outcomes (Unruh, 1997a). While on the one hand, secure political environments are needed for outside investment opportunities to be successful and to contribute to national recovery, the way such endeavors intersect with local postwar realities can have the reverse effect. In LOMACO's case, the company was able to field its own security force for assistance in securing areas and operations (Hoilie, 1994); something most investors in postwar scenarios are unable to replicate. The company also created significant employment for local populations and dislocatees. As a result, areas of LOMACO agricultural investment became a draw for those seeking employment. LOMACO also had interests in other investments in the country, including the Beira oil pipeline, which were vulnerable to landmines. Thus, the company was interested in an end to the war. In this regard, LOMACO played a significant role in the peace process in the country, and participated in the transport of RENAMO personnel to various peace talks in Europe (Vines, 1991).

This case has significant meaning at local, regional, and national scales. The ways in which large TNCs like LOMACO are able to negotiate land and security (including mine presence) in specific locations and wider regions of conflict has significant influence over broader food security and existing land tenure arrangements and the development or re-establishment of local to national land and food supply institutions.

Discussion

The cases presented here are a first attempt to illustrate some of the broader political ecological dimensions that surface in the intersection of landmines and postwar recovery. They also reveal the need for a more comprehensive theory that deals with the repercussions of mine presence on various actors at various scales, in the context of recovery.

While we have focused our examination largely upon one actor or group of actors within particular cases, in reality, scales are fluid and actors at all levels are engaged in complex relationships. As Bryant (1992) points out, actors do not make decisions in a vacuum. Each set of actors at each scale bases decisions upon opportunities and constraints placed on them by other actors operating within a number of scales.

These relationships are relevant to the role of landmines in postwar recovery. Small-scale landholders in the breadbasket example have put significant pressure on land that is free from mines due to the abandonment of large tracts of land where mines are believed to exist. The lands that have been cleared in the years following the end of the civil war (Vines, 1994) have been carefully selected. These decisions have in-part been based on the activities of actors who influence where mine removal occurs. Those occupying lands not cleared, and are not able to move towards postwar recovery as others might be able to. And as seen from the LOMACO example, despite large-scale mining, commercial agriculture was able to exist and thrive—with repercussions on land use and land tenure security for some smallholders. Complex sets of relations determine which areas receive demining attention and in what order (Mather, 2002), and which actors will suffer in the aftermath of the war due to continued landmine presence, while others are able to concentrate on postwar recovery.

The use of political ecology for studying postwar recovery is itself a logical extension of the political-ecology discourse. Recent work by Uvin (1996) and Gezon (1997) has begun to explore similar issues. Uvin uses a political ecology approach to look at the genocide in Rwanda, while Gezon (1997) examined a conflict in Madagascar between competing actors for access to forest resources. While only the Rwanda example specifically examines conflict at the scale of the settings also addressed in the present research, they both illustrate scale issues that complicate conflict scenarios.

The impact of landmines on a peace process is variable, and becomes more problematic, as other social forces develop during recovery. Subsequent to a peace

accord or outright victory, time plays an important role in convincing dislocatees that peace will hold, and that return and pursuit of agricultural activities, and the use of built and social infrastructure is a viable option (Unruh, 2002). As dislocatees gain confidence that hostilities have ceased, and begin to return to their areas of origin or proceed elsewhere, the probability of mine encounter increases, and becomes a larger issue as a peace process proceeds. Thus, problems of re-integration, land access, land conflict, food insecurity, and environmental degradation caused by or aggravated by landmines gain momentum and interact (Unruh, 2001).

The speed and timing with which problems associated with landmines develop can significantly complicate a peace process. If such problems emerge at particularly delicate or sensitive points in the process (e.g., ending UN subsidies for ex-combatants, onset of UN or government programs regarding land reform, arrival of commercial interests in an area, etc.), it can have a much greater impact than at other times. In the absence of other centers of attention, the state—weakened, and of questionable legitimacy for many after a war—is then likely to become the focus of criticism from those experiencing negative outcomes involving attempts to obtain or re-acquire access to land resources and use of infrastructure (Unruh, 1997a). Groups and individuals disenfranchised from the gains of transition from war to peace may resort to violence in order to survive—or to obtain what is perceived to be deserved in terms of a peace dividend—with serious impacts on a peace process (Bruce, 1996; Galli, 1992; Willett, 1995; World Bank, 1994).

The broader conceptual linkages between this analysis of landmines and the wider political ecology literature have to do with issues of the rapidity and fluidity with which change occurs in the dialectic between society and land-based resources, and the resulting intentional and unintentional remaking of nature in the process. Outside of armed combat, postconflict scenarios are arguably some of the most dynamic and fluid of circumstances regarding the interaction between society and resources (in particular, the speed with which spatial scales are restructured). This is especially the case due to the temporal proximity of conflict and recovery, and the often ambiguous distinction between the two for large numbers of civilians. Landmine presence plays an important role in this dynamic, a role which grows significantly as other forms of violence end, but landmine presence continues. In postconflict situations, the scramble for access to the means of survival and livelihood for large numbers of people, together with the pursuit of opportunity by commercial interests, brings how actors intersect with resources to the fore very quickly. The rapidity with which change then occurs in the interaction between the society and resources as population movement and landmine encounter increases, informs the political ecology literature that seeks to analyze such forms of change, but previously had only slower moving examples to examine. In this regard, the landmine case provides an example useful for drawing out differences with other applications of political ecology, not only in terms of rate of change, but also in the different types of social relations possible.

The landmine case also provides a look at the switch in the ‘intent’ aspect of the social ‘remaking’ of nature. While mine-laying strategies during conflict can be

pursued with a very purposeful physical ‘remaking’ of nature in mind, the deployed mines then result in an unintentional remaking of nature in a postconflict phase. This occurs as population movement, resource access, and recovery become the dominant objectives of the actors involved, instead of the wartime objectives of theater control, resource in-access, and social disruption. This switch from an intentional to an unintentional remaking of nature as the context changes from conflict to recovery, is an expansion on political ecology’s approach to how conflict intersects with the society–nature relationship.

The three cases presented here, while not representative of all possible scenarios, illustrate the way landmines are able to redefine the socionatural relations at different spatial scales. This is an important area of political ecology research, because understanding such patterns can inform the character of recovery efforts. The recognition that landmine presence forces certain possibilities of relations between society and resources, allows for attention to be given to recovery efforts that focus on the nexus of political economy, social identities, and political aspirations—as *Castree and Braun (1998)* suggest with regard to the implications of the remaking of nature. Such social and political elements of a peace process are important to attend to as these are often central ingredients to conflict itself.

While it is important to understand the complexities that create conflict, it is equally important to understand the intricacies of the recovery process. Violent conflict, civil wars, and their repercussions are a relatively new direction for political ecology. However, given the importance, effort, money, and time involved in the implementation of peace processes, there is a need for political ecology to specifically engage the issues surrounding postwar recovery.

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