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THE 2000-2004 FAST TRACK LAND REFORM PROGRAM AND BIODIVERSITY ISSUES IN THE MIDDLE SAVE CONSERVANCY

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ABSTRACT

This research sought to assess the impact of the 2000-2004 land resettlement program (commonly termed the fast track land resettlement program) on biodiversity in the Save Valley Conservancy, Ward 24, Chiredzi District in Eastern Zimbabwe. Seventy households and 5 community leaders comprised the research subjects. Questionnaires and interviews were the main research instruments. The study revealed that the 2000-2004 fast track land resettlement program had a negative impact on biodiversity in the Save Valley Conservancy. Poaching, over-hunting, land clearance for cultivation, harvesting of firewood for sale, lack of planning, weak enforcement of environmental regulations were among the major causes of biodiversity loss. On the basis of these findings, it is recommended that the EMA should ensure that environmental impact assessment is done before resettling people on new resettlement schemes. It is also imperative that the relevant government ministry provides basic social and economic infrastructure such as schools, clinics, boreholes, roads and telephone before settling people in a new area. EMA has to educate new farmers on sustainable natural resource use. It is also necessary for the farmers to be financially assisted to enable them to use alternative, environmentally friendly sources of energy such as solar energy and biogas to reduce pressure on woodlands. Finally, it is also recommended that further research be undertaken in other conservancies and wildlife areas that were partly converted to agricultural land in order to establish the full extent of the biodiversity issues involved in the post-land reform era.

Keywords: land reform, fast track land reform program, biodiversity, conservancies, community, sustainability

BACKGROUND TO THE STUDY

A significant proportion of the land surface in Southern Africa comprises dry land areas which can be classified into semi-arid and arid areas. Semi-arid areas constitute about 15% while arid areas make up approximately 28% of the land area (McCullum, 2000). These areas are worst affected by climate variability experienced in the region. Climate variability in

Southern Africa, evidenced by year to year rainfall variability ranging between 30 and 35%, means that livelihoods in dry land or semi-arid areas of the region are not only precarious but often unsustainable. Climate variability in the region is increasingly influenced by El Nino/Southern Oscillation (ENSO) events associated with the periodic warming of the tropical Pacific Ocean and related shifts in atmospheric circulation systems (Cane *et al*., 1994; Hulme, 1996). Rainfall in the region in the early 1990s was 20% lower than that of the 1970s, with significant droughts in the 1980s, early 1990s and in 2002 (Chenje and Johnson 1996; Hirji *et al*., 2002). Whereas the rain-fed agricultural growing season varies from 76 to 120 days in the semi-arid areas, it averages less than 76 days in the arid region (ibid). This means that dry land areas are of low agricultural potential and are ideal for either extensive livestock ranching or for wildlife. Due to the seasonal variations and unreliable rainfall increasingly related to endemic drought, coupled with increasing demand for food to feed growing populations, threats to biodiversity and environmental sustainability in the region are increasing. In Zimbabwe agro-ecological zones IV and V, which are located in the smaller Rwenya catchment area and the much larger Save-Limpopo and Zambezi Valleys, constitute dry land areas. It is in these ecologically fragile areas where biodiversity threats pose the greatest challenge to environmental sustainability.

Bradley and McNamara (1993) define biodiversity as life support systems and natural resources on which man depends. Biological diversity has also been defined as the variability of living organisms in terrestrial, marine and other aquatic ecosystems, and their supporting ecological complexes (UNEP, 1995). Biodiversity incorporates genetic species and ecosystem components. While genetic diversity refers to variations within and between populations of organisms, species diversity relates to the total number of species in a given area (McCullum, 2000). Ecosystem diversity is a measure of the variety of the component species and is also a reference to the different habitats within which species occur (ibid). Forest and/or woodland biodiversity is a crucial issue in Southern Africa because of the critical ecological and socio-economic functions it performs. One ecosystem function forests and woodlands perform is regulation of both macro- and micro-climates, as well as acting as carbon sinks. Forests or woodlands regulate the hydrological cycle and also protect watersheds by stabilizing the land surface, thereby reducing soil erosion, runoff and compaction (Masundire and Matowanyika, 1993; Timberlake and Shaw, 1994; Mushove *et al*., 1996; McCullum, 2000). They are also crucial in nutrient cycling through storage, internal cycling, processing and acquisition of nutrients. Furthermore they help in recovering mobile nutrients as well as in the removal or breakdown of excess nutrients and compounds

Another important ecosystem function forests and woodlands perform is provision of habitats for both resident and transient animal populations (ibid). African savannas support a rich and diverse community of large mammals, both herbivores and carnivores. Herbivores include the *Loxondota africana* (African elephant), *Cnnochoetes taurinus* (Wildebeeste), Thomson's gazelle, *Equus burchelli* (Zebra), antelopes, rhinocerous, and *Cheoropsis liberiensis* (pygmy hippopotamus). Large carnivores found in the savanna are the predators such as *Pathera leo* (lions), *Acinonyx jubatus* (cheetah), leopards, painted dogs, hyena and jackals. Birds such as ostrich, vulture, secretary bird, dove, and ground hornbill are also common in savanna ecosystems (Waterhouse, 1994; McCullum, 2000).

In Zimbabwe savanna grassland is the major type of terrestrial ecosystem which supports diverse communities of herbivores,

carnivores, birds, insects and arachnids. The grassland ecosystem is a result of a climate characterized by low rainfall which falls in one short summer season (Waterhouse, 1994). Because of relatively good rains agro-ecological regions I, II and III have the greatest agricultural potential but have limited diversity of plant and animal species due to intensive cultivation. On the other hand agro-ecological regions IV and V are dry areas of low agricultural potential and therefore rich in wildlife species. Zimbabwe has some of the finest populations of wildlife in Africa, from beautiful species of elephants and rhinos to small antelopes, birds, fish and insects. Its habitats and ecosystems are equally varied and abundant. Taken together this fauna represents the country's biological diversity. This diversity has given rise to a thriving tourism industry which has great potential as a contributor to the country's gross domestic product (GDP). Plant species found in the study area, the Save Valley Conservancy, include creeping bauhinia, leadwood, dwarf elephant root, russet bush willow, Tassel orchid and hibiscus grass. Animal species include herbivores, such as the African elephant, zebra, giraffe, black and white rhinoceros, wildebeest, and antelope. Predators found in the area are the spotted hyena, cheetah, leopards and lions. Birds include helmeted guinea–fowl, white backed vulture and secretary bird among others. There are also many insects such as the African honey bee, African monarch butterfly and arachnids such as thick tailed scorpions and centipedes which are very common in the conservancy (Waterhouse, 1994).

Apart from ecosystem functions, forests and woodlands also offer a variety of socio-economic benefits. Woodlands sustain both Southern Africa's rural human populations and livestock. Agricultural systems depend on forests and woodlands to varying degrees, for instance soil nutrient transfer, and providing nutrients from *termitaria* and from livestock manure since livestock graze and browse in forest or woodland areas. For rural communities and the urban poor in Southern Africa forests and woodlands are the primary energy source in the form of woodfuel or charcoal. Fuel wood demand in the region is on the increase due to a variety of factors which include escalating global oil prices, rapid population growth, rapid urbanization, persistent poverty and lack of realistic energy alternatives (McCullum, 2000). The most frequently used firewood species being *Julbernardia globiflora* (munondo), *Colophospermum mopane* (mopane) and *Brachystegia boehmii* (mupfuti) (Grundy *et al*., 1993). In Southern Africa forests and woodlands are also an important source of timber for construction and furniture making purposes, and for traditional crafts for both household implements and curios. They are also the source of commercial timber hardwoods. The main commercial hardwood timber species include *Pterocarpus angolensis* (kiaat), *Afzelia quanzensis* (chamfuta), *Dalbergia melanoxylon* (African blackwood), *Combretum imberbe* (leadwood), *Diospyros mespiliformis* (African ebony) and *Khaya anthotheca* (red mahogany) (McCullum, 2000).

Researchers are constantly deriving useful products from the forests. Large proportions of the medicines now in use, for example, were developed from tropical plants. Forests and woodlands provide timber, fruits and other products. In Zimbabwe for example, mopane trees promote the breeding of edible caterpillars which are collected in the summer season especially in Matebeleland. Baobab fruits are also collected and sold in urban areas on open markets by vendors. Forests also provide cultural functions in most African countries. For example traditional rain-making ceremonies take place under specific tree species. Plant species such as *Burkea* and *Sclerocarya* are regared as sacred in Shona and Ndebele tribes. Therefore land resettlement programs need to take cognizance of both the ecosystem and socio-economic functions of forests and woodlands.

BIODIVERSITY THREATS

Plant and animal biodiversity can contribute significantly to the economy through tourism and sale of products that nature provides. In spite of its importance biodiversity is on the decline globally. Due to higher levels of industrial development biodiversity loss has been greatest in the North where increased use of herbicides, insecticides and inorganic fertilizers and industrial emissions have greatly contributed to plant and animal biodiversity loss (Botkin and Keller, 1990; Dodds *et al*., 1995). Therefore, preservation of biodiversity remains a big challenge to most developed nations.

In the South, biodiversity loss is closely linked to population growth, socio–economic and political problems. An increase in human population means an increase in demand for food, clothing, shelter, education, health care and other basic needs. This usually translates into greater demand for natural resources such as land, forests and animals. Wildlife areas are often invaded as demand for land rises. Peasants settled either adjacent to or in sections of former wildlife areas use resources in a manner that usually conflicts with state land use plans. They believe that they have open access to wildlife resources while the state believes that access to wildlife should be strictly controlled (Mutepfa *et al*., 1998). Therefore, there is concern that Zimbabwe's land reform program may result in unsustainable natural resource management in newly resettled areas (Katerere, 1992; Matowanyika and Mandondo, 1994; Rukuni *et al*., 1994; Moyo, 1995; Vudzijena, 1998; Rukuni *et al*., 2006).

A common threat to wildlife biodiversity is poaching. In the past few years poaching activities have increased due to demand for certain skins, horns, bones and other products for cultural, medicinal and socio-economic reasons. This is true of elephants and rhinos whose tusks and horns are on demand and have encouraged a lot of poaching. In Zimbabwe, just like in other colonial territories in Africa, the problem of poaching is directly linked to the king's game concept. Settler colonialism introduced the "King's Game" concept of wildlife management, where all natural resources became the property of the state (Murphree, 1990; Mutepfa *et al*., 1998). Murphree and Metcalfe (1997) assert that the indigenous black majority suffered a double expropriation because they lost access to land and to wildlife. Wildlife was no longer regarded as a resource but a liability by the indigenous people. They now viewed wildlife as something without value that had to be tolerated, destroyed or poached. The setting up of large tracts of land for wildlife is a bitter issue that is being constantly debated (IUCN/UNEP/WWF, 1991).

Associated with poaching activities are bush fires that cause much destruction of plant and animal species. Threats to biodiversity conservation can come from wildlife itself. Elephants are such an example in Zimbabwe and Kenya where woodland destruction has been caused due to the ever increasing elephant population in national parks or game reserves (ibid). Wildlife can also destroy fields in communities close to wildlife sanctuaries. Other factors behind biodiversity loss are socio-economic and political problems such as political instability, and influx of refugees. These problems often result in excessive exploitation and export of huge quantities of biodiversity resources such as timber, minerals, fish and wildlife products, thereby negatively impacting biodiversity. Armed conflicts such as those that occurred in the D. R. C., Rwanda and Burundi, Angola, Sierra Leone and Liberia do not only destroy infrastructure, but drastically deplete biodiversity resources.

The realization that biodiversity is under threat the world over has prompted global action and lead to international agreements to conserve biodiversity; the most important being the Convention on International Trade in Endangered Species (CITES) and the Convention on Biological Diversity (CBD). CITES is perhaps best known for its work in either banning or strictly controlling trade in endangered species like the African elephant, crab-eating foxes, Asian bull frogs, black and white rhinos. CITES is viewed by some in political circles as a battle between developing countries against industrialized nations with developed nations and those seeking favors from them imposing trade bans on developing countries (Keating ,1993). Despite such criticism CITES continues to be a source of hope for the conservation of biodiversity. The CBD requires member states to develop national plans, strategies or programs for the conservation and sustainable use of biological diversity and to integrate as much as possible biological diversity into sectoral or cross-sectoral plans and programs (ibid).

In much of Southern Africa the bulk of the population lives in infertile rural areas creating a high demand for better farmland. Chenje (2000) maintains that agriculture is the main habitat displacing activity in the region through its expansion, for example by resettlement or simply through extension of cropland. Large tracts of land left for wildlife are seen as an easy solution to the land hunger problem by both the rural folk and central government. Some families have either moved very close to game reserves or have been resettled in national parks leading to human-wildlife conflicts. Elephants cause havoc when they move into villages inside or bordering the reserves, leaving a trail of destruction to both crops and vegetation in general. In addition lions also often kill domestic animals (ibid). This poses a dilemma to policy makers and planners whether to safeguard the peasants and forego the attendant biodiversity and economic benefits or safeguard the animals and possibly jeopardize rural livelihoods. It should be acknowledged that the issue of biodiversity is not an easy one for Zimbabwe and other countries in the region. Many stakeholders have to be involved in any policy formulation on biodiversity since biodiversity affects different people differently. The land resettlement program of 2000-2004 in Zimbabwe failed to accommodate this need thereby raising high the stakes for biodiversity loss, hence the need to investigate biodiversity issues in wildlife conservancies.

Biodiversity resources in the conservancies are used by both communal and resettled farmers. Demand for these resources has increased over the years. People in the rural areas collect wild fruits, such as baobab fruits, vegetable oils, edible tubers, insects such as caterpillars and sell them at local markets (McCullum, 2000). The collection of these resources provides subsistence apart from generating employment and income (ibid). Perhaps one of the most important resources in conservancies is wood fuel for heating and cooking. Mutepfa *et al*. (1998) state that 31 percent of Zimbabwe's total energy consumption is wood fuel, with 80 percent of the energy demands of communal areas being met by wood fuel. Therefore, preferred tree species are being rapidly destroyed for firewood. Other activities which threaten biodiversity in conservancies are hunting and trapping of small animals which often are related to dry season bush fires which destroy a lot of plants and animals. Depletion of some species may be a result of unsustainable forms of harvesting. It can therefore be concluded that biodiversity is affected directly or indirectly by activities in rural areas adjacent to conservancies.

LAND REFORM, LAND RESETTLEMENT, AND BIODIVERSITY

Land reform in most countries especially less developed countries has mainly taken the form of land tenure changes and land redistribution involving movement of communal farmers onto commercial farms. This is because colonial governments displaced the indigenous people from their land. Mutepfa *et al*. (1998) state that countries of Southern Africa have land tenure systems derived from decades of colonial rule. In most of these countries land was divided into 'tribal', 'state', and 'freehold'. Much of the distribution was associated with inequitable distribution. The link between sustainable resource management and security of tenure is now well acknowledged (Claiborne *et al*., 1997; Rukuni *et al*., 1994).

At global level, international organizations, such as the World Bank and the International Monetary Fund, have played a significant role in shaping the land reform processes in several countries. The World Bank has been at the centre of activities aimed at promoting market based land reforms in Brazil, Colombia and the Philippines (Moyo, 1995). In an effort to promote enforceable land rights, the World Bank has supported the development of basic land administration infrastructure in land tilling projects in Thailand and Nicaragua. In Brazil and Colombia, market-based land acquisition received massive financial support from external sources even in cases where such acquisitions were reactions to land occupations that had already taken place (Moyo, 2000). While in Zimbabwe the World Bank had placed emphasis on market-based land reforms, this has not been accompanied by commensurate resource mobilization to finance land acquisition. Mozambique, which nationalized land ownership at independence, was forced to adapt to the new socio-economic order that allows the free movements of international capital (Moyo, 1998; Moyo, 2000). Although some countries opted for market-based land reforms, others opted for radical land reforms through the nationalization of land ownership. These include Tanzania, Mozambique and Angola

The land question has continued to be an emotive and controversial issue in Southern Africa. In South Africa land distribution at independence was highly inequitable. The land laws were influenced by the apartheid policy of separate development of the races. The blacks were dispossessed of their land and remained in a state of landlessness (Mutepfa *et al*., 1998). The current land reform program consists of three sub programmes involving land redistribution, land restitution and tenure reform (Fakir and Mayet, 1998). Land redistribution ensures access to land by the poor and disadvantaged with the assistance of state grants. It is a market driven land reform program. Land restitution, on the other hand, is intended to compensate victims forced off their land after 1913. Fakir and Mayet (1998) assert that the program required claims to be made within three years of setting up of the land claims court. This has not moved as planned since victims fail to provide written evidence with their claims. Tenure reform is designed to provide more security of tenure to all South Africans. The demand for land in South Africa remains very high (Sechele, 1998). Mutepfa *et al*. (1998) also point out that restitution has led to cases where land claims were made on conservation areas such as Makuleke, Dwese, Blyde River Canyon, and other protected areas. Furthermore, areas communally occupied have been left bare of wild fruits, wildlife and even thatch grass. Demand for firewood for household energy is so big that Sechele (1998) asserts that 74% of the people get firewood either legally or illegally from neighboring farms causing a serious depletion in the woodlots. Apart from wood the households also obtain poached meat from the farms. The biodiversity impacts are therefore significant.

Land reform in Zambia was slightly different from that of South Africa. According to Mutepfa *et al*. (1998), Zambia has

undergone three major land reform phases since its independence in 1964. In 1975 the thrust of the reform program was to convert all land to state land. From 1985 to 1995 the reform process aimed at restricting grant of land to non-Zambians. The reforms in 1995 were an attempt to make it possible for people who owned land under customary legislation to convert such land into leasehold tenure without payment for conversion. The Zambian land reform program managed to abolish freehold title to land and replaced it with leasehold tenure of 99 years. This did not affect reserves and trust lands much. Some estates were converted to state land to pave way for human settlement resulting in disturbance of habitats for birds and animals. Therefore in this manner biodiversity was lost (Chileshe, 1998).

In Mozambique land reform was initially a radical process with all land being nationalized by a land bill of 1979. Because of the Socialist thrust, private land became state farms or socialist co-operatives. After the Renamo War, there was need to revisit the land issue due to its failure to achieve intended objectives. The state farms and co-operatives were inefficient and failed to supply the market and earn foreign exchange while the despised smallholder was the main producer for both the local and international markets. In addition external investors had no confidence in the legal framework of land issues **(**Mutepfa *et al*., 1998). For these reasons the government of Mozambique was forced to introduce a new land bill in 1997. The new land bill does not need a title or a deed to assure tenure security. A community can apply for title deeds and can participate in the management of natural resources in areas under its jurisdiction **(**ibid).

In Namibia the land issue was the core of the liberation struggle. The purpose of the land reform program was to redress inequitable land distribution and discrimination against women with regard to land tenure. Land of absentee farmers was expropriated while foreigners were given use rights only. Ownership of very large farms or more than one farm was not allowed. Abandoned land and under-utilized commercial land was re-allocated and brought into productive use. Furthermore commercial farmers were not allowed access to communal grazing land (ibid). A conference on the land issue in Namibia was heavily criticized for failing to agree on the question of freehold tenure, the basic issue in any redistribution plan. The government was criticized for its commitment to a market economy and its expressed aim to attract foreign investors which was believed to have worked against radical land reform. Mutepfa *et al*. (1998) further note that absence of local representation during the land redistribution conference lead to the monopolization of land by the wealthy and to unwise utilization of natural resources. The argument that commercial farms should remain untouched because they were productive has also been questioned. Mutepfa *et al*. (1998) argue that productivity should be measured not in marketable produce but in the number of people who gained a living from the land. Namibians have a strong conviction that pasture management through fenced and privately utilized economic units will benefit only those who are already advantaged. Although the government had a desire for orderly land reform, encroachment into protected areas still resulted in the loss of biodiversity.

The land reform dynamics in Zimbabwe since 1980 have to be understood within the framework of colonial land policies and legislation between 1889 and 1980 (Vudzijena, 1995). Mutepfa *et al*. (1998) state that colonial land policies and legislation were designed to deprive the indigenous population of land and natural resource property rights in favor of white settler farmers. The cornerstone in the process of expropriation was the Land Apportionment Act of 1930 which partitioned all land into European and African Reserves (Rukuni *et al*., 2006). The racially structured political economy of settler colonialism

and the resultant discriminatory policies of pre-independence governments with regard to land ownership, epitomized by the Land Tenure Act of 1969, and the supply pattern of agricultural land did not only favor the whites and the large scale commercial farming sector, but also pushed the black majority onto poor quality land and excluded them from over half the land base (Vudzijena, 1995; Mutepfa *et al*., 1998; Rukuni *et al*., 2006). Vudzijena (1995) further argues that the 1951 Native Land Husbandry Act imposed and enforced state based conservation practices on land owned by blacks. The land reform program, which was adopted at independence in 1980, aimed at redressing the inequitable distribution of land. It entailed acquiring land from the large scale commercial sector and redistributing it to small scale farmers from the communal lands, as part of the overall resettlement program (Vudzijena, 1995; Moyo, 1998; Moyo, 2000; Rukuni *et al*., 2006). The program was designed to redress the colonial imbalances of land holdings between the communal and large scale commercial sectors.

In the early stages of the resettlement program, 1980-1985, preference was given to returning refugees, thousands of war displaced people, and the poorest that had little or no land to support their families within the communal areas. During the first ten years of independence, resettlement land could only be acquired on a willing buyer- willing seller basis with the government paying the full market price for the land and competing for it with other buyers on the open market, albeit government had the right of first refusal (Mutepfa *et al*., 1998; Rukuni *et al*., 2006). Moyo (2000) maintains that money for purchasing land was provided by the British Overseas Development Agency (ODA), but frequently the funds were not available when the government required them. Therefore the program had only a minor impact on the land distribution pattern in Zimbabwe since demand for land remained high among communal area residents (ibid). This was largely because until 1990, the government could not compulsorily acquire land from the large scale commercial sector due to the constitutional guarantees made to the farmers in this sector at the Lancaster House Constitutional Conference (Moyo, 1998; Rukuni *et al*., 2006). As a result of these problems, the government was unable to meet its resettlement targets. The amount of land purchased for resettlement was small, not only because of financial but also institutional constraints faced by government. Much of the land purchased for resettlement was in marginal areas because this was the land the large scale commercial farmers were willing to sell on the open market (Mutepfa *et al*., 1998; Rukuni *et al*., 2006).

In the second phase, 1985-1990, just like in the first phase, resettlement land was acquired on a willing buyer-willing seller basis with the government paying the full market price for the land on the open market. As a result government failed to get enough land to resettle people (Moyo, 1995; Mutepfa *et al*., 1998; Rukuni *et al*., 2006). The third phase started in 1997 with designation of 1 471 large farms for possible compulsory acquisition. Most farms (804) were delisted as the government, donor and large-scale farmers sought a negotiated framework. Unfortunately the donor conference of 1998 did not come up with a credible plan since only 250 000 hectares of land were acquired by government. The state abandoned the spirit of negotiation and veered towards constitutional changes. The draft constitution of 2000, however, was rejected allegedly at the instigation of commercial farmers who objected to a clause on compulsory acquisition of land.

It was against this background, and the serious threat to its political survival posed by the newly formed opposition party, the Movement for Democratic Change (MDC), that the Mugabe regime implemented the fast track land reform program. Communal people and war veterans subsequently invaded farms in 2000 and the government formalized land occupation in

what it called the 'accelerated land reform program' (Moyo, 1995; Moyo, 1998; Rukuni *et al*., 2006). Moyo (2000) asserts that after the rejection of the Draft Constitution in February 2000, the government amended section 16A of the Zimbabwe Constitution so that it recognizes the colonial dispossession of Zimbabweans of their land. This enabled government to gain ownership of land through compulsory acquisition of agricultural land for resettlement, thereby ushering in the fourth phase which came to be commonly called the 'fast track land reform program'.

Unlike during the third phase when farm occupations were peaceful, in some instances, and the farmers were allowed to continue on the farms, this more recent wave of farm occupations was more violent and the white farmers were evicted from their farms. Initially it was done in a haphazard manner with the new settlers exploiting available wildlife and plant resources in an unsustainable manner, both in the areas of high agricultural potential and those of low potential like conservancies. Some people moved onto the farms allegedly as new settlers but with the intention of looting resources from the farms (Rukuni *et al*., 2006). The fast track compulsory land acquisition process by virtue of its rapid pace, as well as its unplanned and chaotic nature, was bound to adversely affect biodiversity. The land allocation process took insufficient account of some of the fundamental requirements for wildlife conservation, such as core animal refuges, buffer zones around the refuges and corridors between them. Conservancies were developed on the basis of those principles (Campbell *et al*., 1989). Any land reform program which fails to take cognizance of these fundamental requirements is bound to result in biodiversity loss. The major issue was not just equitable land distribution, but how land could be sustainably exploited. This is an important consideration given the fact that inappropriate peasant farming systems in the communal lands of the Save catchment are said to have caused soil loss ranging from 40 to 100 tons per hectare annually (Du Toit *et al*., 1992). The land reform program, therefore, was not well suited for conservancy areas but now that it has been implemented, there is need to assess its impact on the conservancies. This research therefore sought to evaluate the impact of the 2000-2004 fast track land reform programs on biodiversity of the Save Valley Conservancy in Ward 24 of Chiredzi District in Zimbabwe.

THE CONSERVANCY CONCEPT AND BIODIVERSITY

Conservancy approaches in Southern Africa share certain similarities. In South Africa there is no statutory definition of a conservancy but commercial farmers work together to attain common management arrangements for economic and ecological reasons. Thus, in Natal, neighboring farmers pool resources in an effort to maintain sufficient wildlife for aesthetic and recreational purposes (Murphree and Metcalfe, 1997). In Namibia conservancies started when farmers, to exploit economies of scale and make the best use of the ecology of arid lands, pooled resources to implement boundary game-proof fencing. The policy did not restrict these conservancies to commercial land but also extended to communal land.

In Zimbabwe there is no statutory definition of a conservancy. Waterhouse (1994) defines a conservancy as any number of properties which operate as a single unit for more effective management, utilization, and protection of natural resources in that area. In Zimbabwe conservancies are mainly associated with agro-ecological regions IV and V. The extensive rangelands in these regions are unsuitable for crop production due to low and erratic rainfall. It should, however, be noted that conservancies are also found in agro-ecological regions I, II and III (ibid). This shows the weakness of using natural regions to determine location of conservancies.

The conservancy concept developed in Zimbabwe because it is a better economic and ecological strategy against the effects of drought. Moreover the key resources can be used efficiently and sustainably when there is greater diversity and large populations since the areas are unfenced. Furthermore, there is the advantage of spreading risks, and management of resources is at a more appropriate scale (ibid). Conservancies can play a crucial role in matters of conservation. They can accommodate larger game species.

Most conservancies in Zimbabwe share boundaries with communal lands. While wildlife ranching as a land use function became well established in the 1980's, the incorporation of communal lands by conservancies has proved to be difficult. Two main approaches were pursued in this regard. One was for communities to contribute land to the conservancies. The Communal Areas Management Programme for Indigenous Resources (CAMPFIRE) suggests that there may be innovative methods of integrating communal areas with conservancies. This, however, is difficult given the population pressures in many communal lands that are adjacent to conservancies. The other approach is direct involvement by local communities in business operations in the conservancies. This could be in the form of grants from donors on behalf of communal areas that would be used to restock the conservancies. The communal income would be raised through envisaged tourist operations that would generate revenue (Waterhouse, 1994). Ironically, the fast track land reform program of 2000-2004 inadvertently introduced communal farmers to conservancies, by resettling some in former conservancy areas, hence the need to carry out research on biodiversity impacts of the controversial fast track land reform program.

In the case of the Lowveld, conservancies were developed on the understanding that rangeland resources in an area with a variable and fragile environment are best managed on a large scale than on an individual farm basis. The area also has a low carrying capacity for cattle and therefore is ideal for wildlife (ibid). The drought of 1991-92 was a big blow to those with cattle in the Save Valley Conservancy and to a lesser extent those in Chiredzi River and Bubiana conservancies. By maintaining natural habitats for wildlife, conservancies potentially contribute to soil and water conservation in the Lowveld and help recover degraded ecosystems. They can also assist significantly in the conservation of endangered species such as the black rhino. Another potential benefit is that they can help increase the tourist destinations available in the country and help earn foreign currency.

In conservancy areas of Zimbabwe large and diverse biological heritage is at risk in all regions, mainly due to human-wildlife conflicts. Such human-wildlife conflicts are a real problem in the Save Valley Conservancy in Ward 24 of Chiredzi District. This conflict became most intense when the land reform program began. Encroachment into wildlife areas by poverty stricken and landless peasants, bush fire outbreaks, poaching, tree felling for timber, fuel wood and cultivation are not only evidence of such conflict but pose serious threats to biodiversity in the Save Valley Conservation in Ward 24 of Chiredzi District; hence, the need for this research.

DESCRIPTION OF THE STUDY AREA

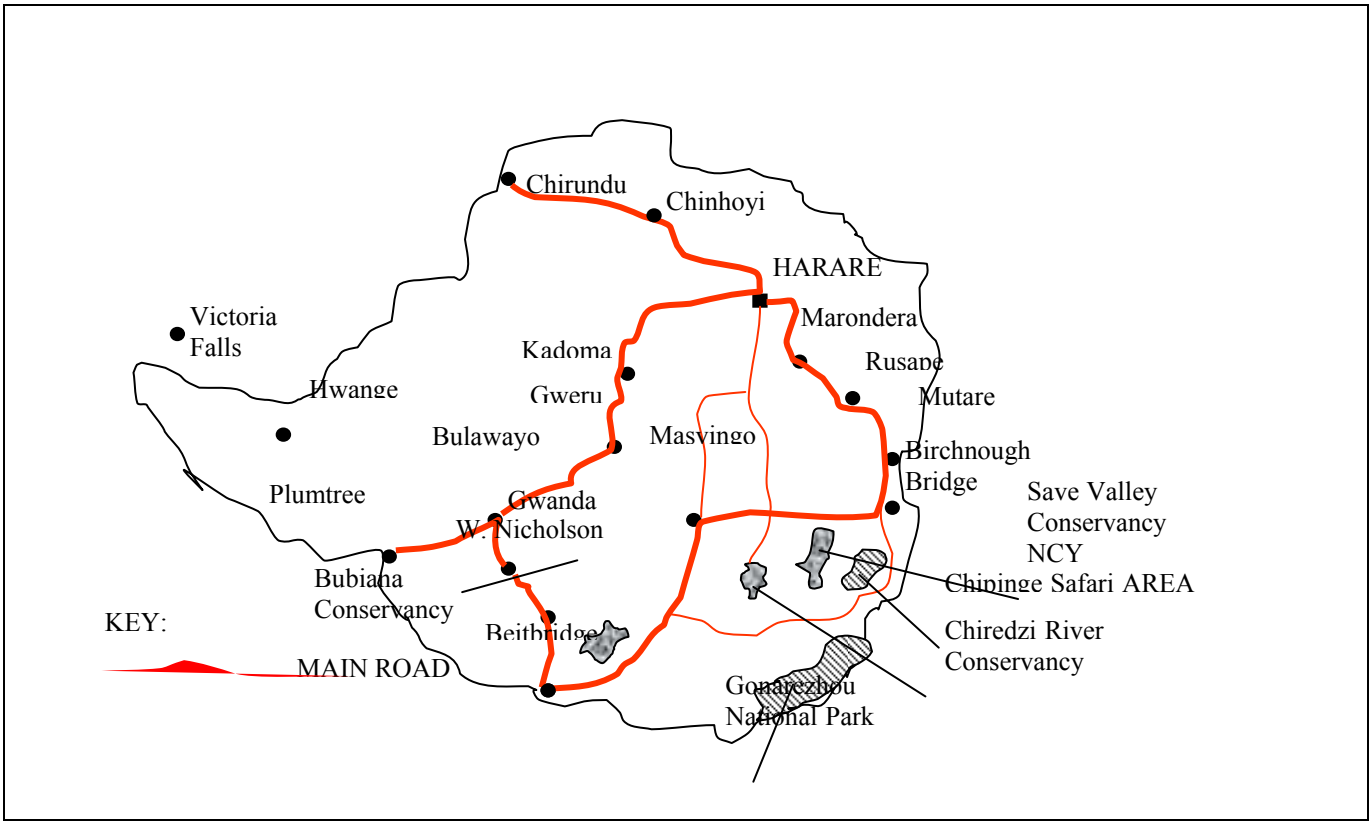
The Save Valley Conservancy is located in the South East Lowveld with the Southern boundary being approximately 40 kilometers from Chiredzi. The eastern boundary of the Conservancy runs along the Save River and the northern boundary along the Masvingo to Birchenough Bridge road. It is 279 kilometers from Mutare and 163 kilometers from Masvingo. The Conservancy is made up of 23 individual properties, although this in fact constitutes 18 management units or extensive ranches. Three of these ranches found in Ward 24: Levanga, Mkwasine, and Senuko were the subject of this research. It should be noted that some of the conservancy members like the Mkwasine Ranch continued to hold substantial herds of cattle until the time of the 2000-2004 land reform program. It covers an area of 240 square kilometers (Waterhouse, 1994).

Since the conservancy is located in agro-ecological region V mean daily maximum temperatures are high, averaging 35^0C with rainfall ranging from 300-500 mm per annum. Surface water is limited with many river flows being sub-surface during the dry season. Ground water is poor except in the alluvial deposits along the Save River (IUCN/UNEP/WWF, 1991). The geology of the Save Valley Conservancy consists largely of gneisses and paragneisses forming gently, undulating terrain with scattered kopjes. The south eastern section of the ward (bordering Mkwasine Ranch and Sengwe Communal lands) has the greatest geological diversity, with the surface rocks including Umkondo limestone, quartzites, sanstones, as well as extensive dolerite intrusions (Swift, 1962). The most easterly corner of the conservancy touches an expanse of karoo grits, comprising much of Sengwe Communal lands and Levanga Ranch. Basement rocks extending through the central and western sections of Senuko Ranch appear to be accompanied only by limited dolerite outcrops and pegmatite veins for example at the Njerezi Bridge (ibid). Ward 24 is 480–520 meters above sea level with kopjes rising to 630 metres above sea level (Waterhouse, 1994). The vegetation of Save Valley is open woodland characterized by woody species such as *Acacia nigrescens*. The vegetation can be divided into four major types which are kopje vegetation, riverine thicket, *Colophospermum mopane* open woodland and *Combretum* open woodland and scrub mopane (Waterhouse, 1994).

Save Valley was formerly a major wildlife refuge. However, competition for cattle ranching and specific species eradication measures conducted in an attempt to control foot and mouth disease outbreaks, have over the years led to a reduction in wildlife numbers (WWF, 1994). In recent years there has been some restocking effort, as interest in wildlife utilisation has grown. Species brought in have included black rhino, from the Zambezi Valley, and elephant, from a population reduction exercise in Gonarezhou National Park. Waterhouse (1994) also notes that buffalo have been re-introduced into the conservancy.

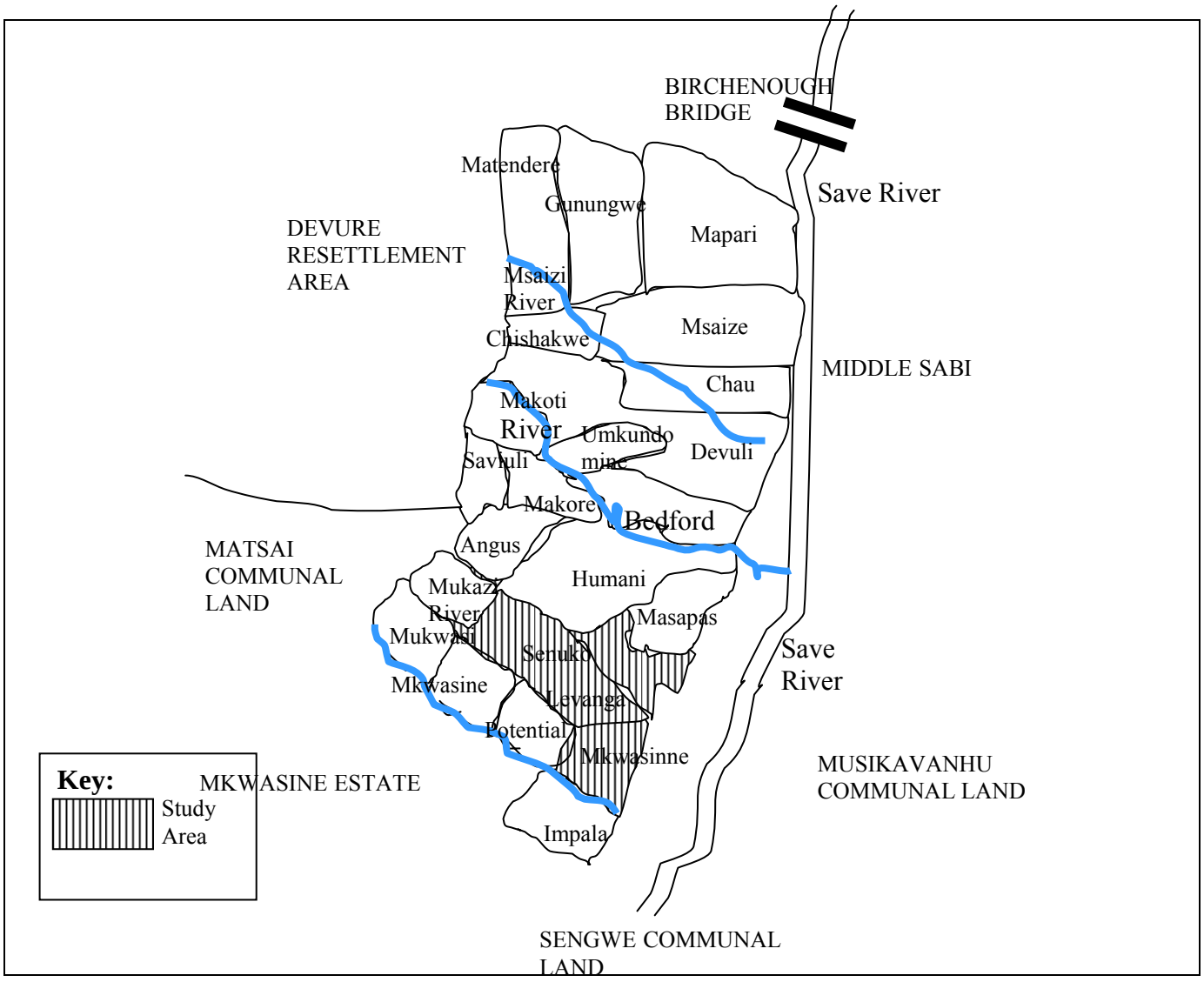
Since the conservancy falls within Region V, its potential for dry land agriculture is severely limited. Therefore yields of the main crops grown here: maize, sorghum, and millet are low, although livestock populations in the surrounding communal lands are high. The sugar estates at Triangle, Hippo Valley and Mkwasine are the major drivers of economic activity, offering employment to many locals.

Figure 1.1: The Save Valley, Bubiana, and Chiredzi River Conservancies



Source: Waterhouse (1994)

Figure 1.2: Save Valley Conservancy



Source: Waterhouse (1994)

RESEARCH METHODOLOGY

The research design was both qualitative and quantitative, relying on questionnaires, semi-structured interviews and observation as complementary methods. Interviewer administered questionnaires were used since many of the respondents in the study area could neither read nor write. Closed questions were used to ensure precision of responses, limit time spent in training research assistants and to reduce the overall survey period. Open-ended items were also included to obtain more detailed information about biodiversity issues in the study area. The researchers also used semi-structured interviews to solicit information from community leaders, game wardens and rangers in Mkwasine, Senuko, and Levanga Ranches in Ward 24. Interviews were used to fill information gaps in the survey and also to clarify grey areas revealed by the questionnaire survey. The data collection process was however time consuming since it involved not only visiting Save Valley Conservancy, but also securing the necessary permission from the community leaders and conservancy owners in Ward 24 and later confirming prior arrangements. Observation, aided by photography, was an integral part of the research process being used to identify evidence of biodiversity loss; for instance pole and dagga huts, fields fenced with branches, piles of firewood at homesteads, and any signs of veld fires.

Research was conducted in Ward 24 of Chiredzi District which has 15 villages. The research sought information on the impact of the 2000-2004 fast-track land resettlement programs on biodiversity in the Ward. Multi-stage random sampling was employed to choose a representative sample. A sample of 70 households from 7 of the 15 villages was selected using simple random sampling. Seven cards, each bearing the name of a village, were drawn randomly without replacement from a box with the names of the 15 villages put in a box. This process gave each village an equal chance of being selected. Selection of the 7 villages which were just one short of half the total number of villages, and therefore deemed representative of the target population, was done to obtain a manageable area of study. The researchers again used simple random sampling to select 10 households from each of the 7 villages. These were the households who responded to the questionnaire. The researchers also used purposive sampling to choose five community leaders to be involved in the semi-structured interviews. These were traditional, church and political leaders, who, together with conservancy or ranch owners, were used as key informants. Pre-testing of the research instruments (the questionnaire and interview schedule) was done in one of the 8 villages that did not constitute the sample.

Permission to conduct research was sought from the Ward councilor while owners of the three ranches that make part of the conservancy (Senuko, Levanga, and Mkwasine), village heads, and 5 community leaders were approached to seek permission to interview them, game rangers and wardens and serve villagers the questionnaires. The researchers also attended the councilor's meetings with villagers and informed the households about the study and made arrangements concerning the survey. In addition the researchers visited Senuko, Levanga, and Mkwasine Ranches collecting wildlife population data. The data collection period spanned the period from end of October to end of December 2007, and took a longer period than anticipated due to the flooding of Save River. The researchers had to use a hired canoe to cross the Save River to reach parts of the study area.

A major assumption of the study was that every new farmer under the A1 and A2 model of the fast–track land resettlement

program depends primarily on biodiversity resources for their basic needs, especially shelter, food and energy. It was also assumed that the majority of the resettled war collaborators, war veterans and peasants are poor. In addition it was assumed that they lack capital and have little knowledge about conservation of biodiversity. The research was concerned with the impacts of the 2000-2004 fast track land reform program on biodiversity in Ward 24 of Chiredzi District with a special focus on the Save Valley Conservancy because that was the area where many landless peasants were resettled in the District. This study was concerned with the opinions of commercial farmers who operate in the Save Valley Conservancy, on the state of biodiversity before and after the introduction of the land reform program. In addition the views of the newly resettled farmers, community leaders such as chiefs and headmen, the Rural District Council officials, the Environmental Management Agency (EMA) and other government officials were equally important. To try and measure the extent of biodiversity loss in the area hypotheses were formulated and tested.

STATEMENT OF HYPOTHESES

H_o - The 2000-2004 fast track land resettlement program has not caused loss of biodiversity in the Save Valley Conservancy.

H_1 - The 2000-2004 fast track land resettlement program has caused loss of biodiversity in the Save Valley Conservancy.

RESULTS AND DISCUSSION

Some respondents were initially unwilling to divulge information relating to the impact of the fast track land resettlement program on biodiversity since the country was heading towards what looked like a historic election. Since the land issue had been highly politicized by the ruling ZANU-PF party, and therefore a very emotive issue, some respondents were afraid of falling victim to politically motivated violence. To try and allay their fears anonymity and confidentiality of both the survey and the structured interviews were stressed to respondents.

Both survey and interview data was analyzed to determine the impacts of the 2000-2004 fast track land reform programs on biodiversity in the Save Valley Conservancy. Of the seventy households that constituted the sample, 60% were male. The dominance of males seems to confirm claims by some researchers that the fast track resettlement program ignored gender equity issues since 53% of the country's population is female (Rukuni *et al*., 2006). Interviews revealed that many women remained in the communal areas where the settlers came from in order for children to attend school, since there were no schools in the newly resettled areas. The research also examined the educational levels of the respondents. Survey results show that 94.3% of the respondents had a primary school education while the remaining 5.7% had some Ordinary level education. The study also sought data on household size, since household size determines resource consumption levels.

Table 1: Household Size

Number of members	Frequency	Percentage
5-6	2	2.9
7-8	7	10.0
9-10	13	18.5
11-12	40	57.2
12+	8	11.4
Total	70	100

Table 1 shows that there were many very large households in the sampled villages. The majority of households (57.2%) had 11-12 people, with 18.5% of the households having 9-10 members, while 11.4% of the households had more than twelve members. Therefore 87% of the sampled households had 9 or more people. Considering that these are poor rural households heavily dependent on natural resources for their livelihoods, the depletion of biodiversity resources is bound to be high as pointed out by other researchers (Grundy *et al*., 1993; McCullum, 2000).

Livelihood activities of the households were also examined. Survey results revealed that 61% of the households were engaged in hunting, 30% in crop production, while 9% were engaged in firewood sales. Biodiversity impacts from these activities were through veld fires, often associated with hunting activities, and vegetation clearance. One criteria used to try and assess the biodiversity impact of the fast track land reform program in the Save Valley Conservancy was the period of stay of the resettled farmers.

Table 2: Period of Stay in Ward 24

Period of Stay (years)	Frequency	Percentage
1-2	3	4.3
3-4	5	7.1
5-6	51	72.9
7>	11	15.7
Total	70	100

Table 2 shows that most of the households, (72.9%), had stayed for more than 5-6 years in the conservancy, while 15.7% had been in the area for at least seven years. Only 11.4% of the households had stayed in the area for a period not exceeding four years. The majority of the sampled households have therefore been in the area since the beginning of the fast track land resettlement process in 2000. The livelihood activities of the farmers were bound to result in unsustainable resource management and negatively impact biodiversity as argued by many researchers on land reform (Katerere, 1992; Matowanyika and Mandondo, 1994; Moyo, 1995; Mutepfa *et al*., 1998; Vudzijena, 1998; Chenje, 2000; Rukuni *et al*., 2006). The research also sought data on size of land allocated to the new farmers to try and measure the extent of land clearance for

cultivation (Table 3).

Table 3: Land Allocation and Clearance in the Conservancy

Land size allocated (ha)	Households Allocated land	Percentage of all households	Total land Allocated (ha)	Total area cleared (ha)
10	51	72.8	510	280.5
20	10	14.3	200	80.0
30	3	4.3	90	36.0
40	6	8.6	240	90.0
Total	70	100	1040	486.5

The survey, as shown in Table 3, revealed that a majority of the households, 72.8%, were allocated ten hectares, 14.3% had 20ha, with the remaining 12.8% allocated 30 to 40ha. Almost half of the land allocated (47%) has already been cleared in a space of seven years. The biodiversity and environmental implications are obvious. Part of the remaining land that has not been cleared is set aside for grazing. Table 4 shows the livestock owned by the sample population.

Table 4: Livestock Owned by Sampled Households

	Cattle		Goats	
Livestock owned	Number of households	Percentage of households	Number of households	Percentage of households
0	14	20	10	14.2
1-3	5	7.1	13	18.6
4-6	26	37.2	24	34.3
7+	25	35.7	23	32.9
Total	70	100	70	100

Most households owned livestock, 80% owning cattle and 85.8% goats. The results in Table 4 suggest that there were many households with cattle and goats. While 72.9% of the sampled households owned four or more cattle, 67.2% had four or more goats. While 18.6% of the households owned 1-3 goats, only 7.1% of the households had the same number of cattle. Livestock ownership puts further pressure on woodland resources in the study area since, as Waterhouse (1994) states, the area has a low carrying capacity for cattle. A significant number of households, however, did not own any livestock, 20% without cattle and 14.2% without goats. These are poor households whose livelihoods are rendered precarious, especially by non-ownership of cattle for draught power. The study also sought information on energy sources. Survey results revealed that all the sampled households relied on firewood for all their energy needs. The biodiversity pressures will therefore come from several sources: land clearance for cultivation, conversion of wildlife rangelands to grazing lands for livestock, and from demand for fuel wood. The researchers tried to estimate the amount of wood fuel used by seeking information on the number of bundles consumed per household per week both in summer and during the cool season (winter). Results in figures 1a and 1b show that family sizes are generally big and therefore, require large amounts of woodfuel per week. For the smaller families, the demand is skewed towards fewer firewood bundles while for the larger families it is skewed towards more firewood bundles.

Figure 1a: Weekly Consumption of Firewood by Smaller Households

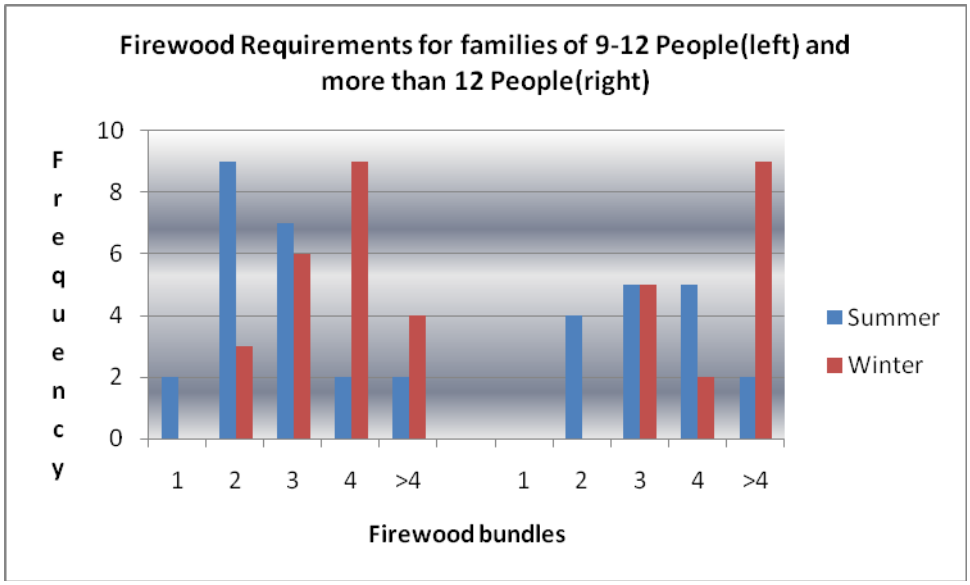


Figure 1b: Weekly Consumption of Firewood by Larger Households

It was considered more realistic to deal with household consumption rather than individual consumption because a household is a functional unit of which the individual is a part. Figures 1a and 1b show a close correlation between household size and amount of wood consumed. It seems more wood is used for heating in the winter period than in summer. An additional bundle of firewood per week seems to be needed for heating during the winter periods. Information on type and amount of wood harvested was also sought (Table 5).

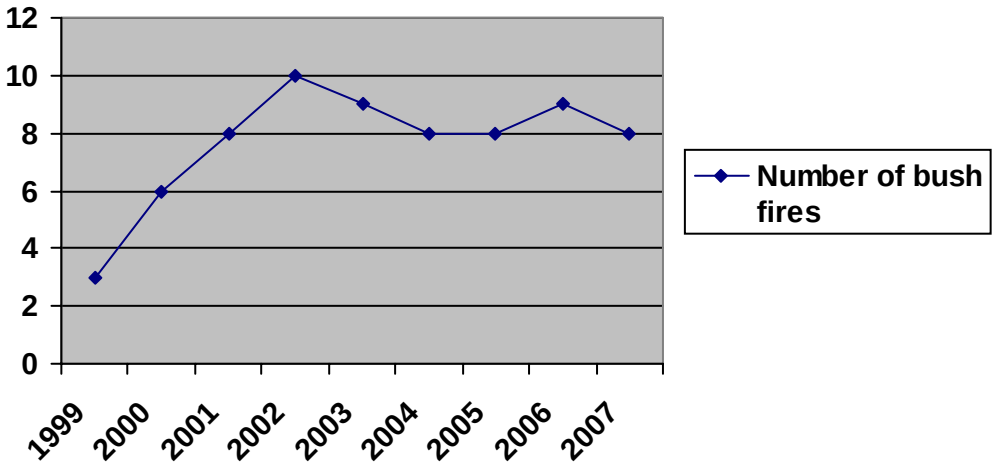
Table 5: Amount and Type of Firewood Harvested per Week

Number of bundles per week (Ave wt of fresh bundle – 20kg; Ave wt of dry bundle – 30kg)	Households harvesting fresh wood	Total amount of fresh wood harvested /week (kg)	Households harvesting dry wood	Total amount of dry wood harvested /week (kg)
2	20	800	9	540
3	22	1 320	12	1 080
4	12	960	10	1 200
5+	16	1 600	39	5 850
Total	70	4 680	70	8 670

It is apparent from Table 5 that there is considerable variation around the average number of bundles used by households. Depending on the household size two to four bundles of wood are collected each week for cooking and heating purposes as well as for sale. A total of 13.35 tonnes of wood; 4.68 tonnes of fresh wood and 8.67 tonnes of dry wood, are harvested per week. Survey and interview results showed that most of the fresh wood was destined for sale at the nearby Checheche Growth Point. These results confirm already observed trends concerning the dominance of firewood as an energy source in Zimbabwe (Mutepfa, 1998).

Interviews with key informants revealed that biodiversity threats do not come from demand for wood fuel only, but also from other sources. These include use of woodland resources for construction materials, foodstuff, medicine, fencing and fibre, as well as bush fires. Survey results showed that wooden poles constituted approximately 90% of construction materials for walls and roofs. Research results also showed that large amounts of wood are used in the study area for fencing and to construct cattle kraals and goat pens. The use of indigenous timber for fencing is perhaps of lesser importance than the demand for construction materials and firewood. *Hyperrehnia filipendula* (thatch grass) with rope fibre from *Colophospermum mopane* (mopane**),** *Brachystegia boehmii* (mupfuti), and (muunze) were popular with the farmers as roofing materials. Plate 1 shows some of the multiple uses of woodland resources. The results show that most of the preferred tree species were varnishing from the area, for instance A*fzella quanzensis* (chamfuta or pod mahogany) which provides tough durable timber for making expensive furniture. The fast track land reform program also seems to have resulted in a rise in the incidence of bush fires (Figure 2).

Figure 2: Bush Fire Incidence in the Save Valley Conservancy

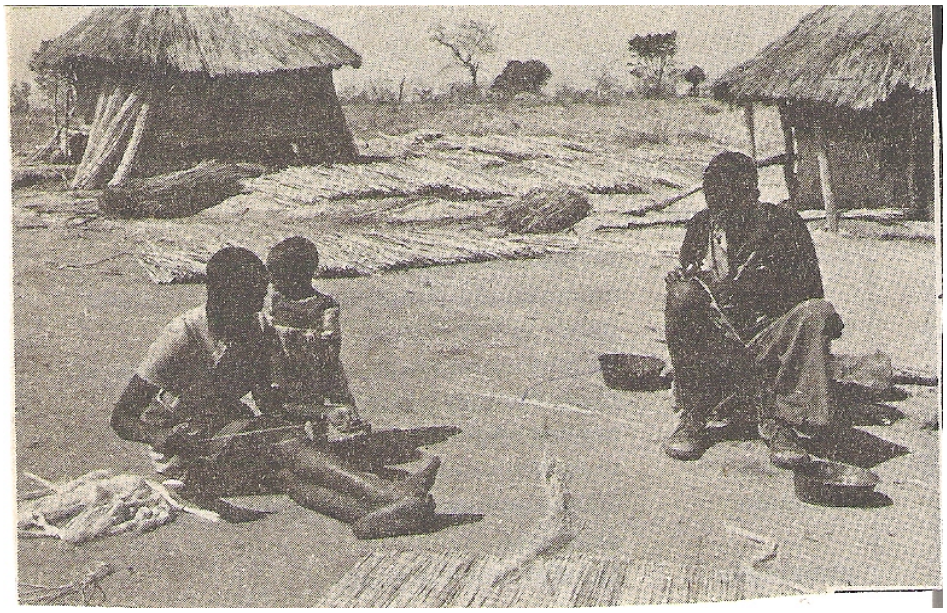


Source: Adapted from wildlife records for Save Valley Conservancy

It appears from Figure 2 that the frequency of bush fires increased with the advent of the fast track land reform program, peaking in 2002-2003, slightly declining from 2003 t0 2005 and picking again in 2006. Research results showed that Mkwasine and Levanga, which lost more land to the fast track program were more affected by intentional as well as accidental bush fires (from harvesting wild honey and hunting) than Senuko ranch. It is apparent, therefore, that the fast track land resettlement program in Zimbabwe, like land reform programs in the rest of the Southern African region (Chileshe, 1998; Mutepfa *et al*, 1998; Sechele, 1998), poses huge challenges to biodiversity conservation.

Community leaders who were interviewed regarded poverty, ignorance and lack of environmental education as the major factors that forced the new peasant farmers to use woodland resources in an unsustainable manner. If the current rate of vegetation clearance continues, shortages of firewood, construction and fencing timber, indigenous food stuffs and medicine are likely to be experienced in the study area. Considering that the study area is in a semi-arid region characterized by open woodland, a high rate of deforestation is occurring in Ward 24. This trend will pose a serious threat to both species and ecosystem diversity.

Plate 1: Multiple Uses of Woodland Resources



The researchers also sought information on other benefits that the resettled farmers derived from woodland resources. Both interview and survey results revealed several other benefits. These include honey, leaves (like the tender leaves of *Adansonia digitata* and A*fzella quanzensis)* for food and roots for medicinal purposes. In addition the caterpillar species *Imbrasia belina* and *Gynanisa maia* (mopane worm or amacimbi) is an important source of protein.

In order to measure the impact of the fast track land reform program on wildlife, the researchers obtained data on wildlife populations on the three ranches constituting the conservancy (Table 6).

Table 6: Wildlife Population of Selected Major Species in the Save Valley Conservancy

	Senuko		Levanga		Mkwasine		Grand Total	Grand Total	
Species	2000	2007	2000	2007	2000	2007	2000	2007	Overall %age Change
Buffalo	154	160	13	20	85	36	252	216	-14.3
Elephant	35	30	25	46	30	0	90	76	-15.6
Black Rhino	35	18	10	15	13	0	58	33	-43.1
Zebra	250	200	150	190	215	100	615	490	-20.3
Lion	25	25	21	50	15	25	61	100	+63.9
Leopard	30	28	21	50	40	75	91	153	+68.1
Kudu	720	450	800	300	85	80	1605	830	-48.43
Eland	160	135	190	153	70	36	420	324	-22..9
Wildbeeste	250	260	264	140	200	40	714	440	-38.4
Sable	25	45	20	0	8	0	53	45	-15.1
Total	1684	1351	1514	964	761	392	3959	2707	-31.6

Source: Adapted from wildlife records for Senuko, Levanga, and Mkwasine

Table 6 shows that although there were increases in the population of some grazers and browsers on individual wildlife ranches: buffalo and sable for Senuko, and buffalo, elephant, black rhino and zebra for Levanga, overall there was a population decline for all grazers and browsers in the conservancy. Kudu, black rhino (on the CITES appendix of endangered species) and wildebeest had the highest declines. The population of the two predators, lion and leopard, increased in the whole conservancy, perhaps in a small way accounting for the decline of browsers and grazers. The wildlife records suggest that the 2000-2004 land resettlement programs caused a major decrease in the number of wildlife herbivore species in the Save Valley Conservancy. It would appear from these results that the fast track land reform program poses major threats to wildlife biodiversity, especially through poaching. This confirms findings from earlier studies (Murphree, 1990; Murphree and Metcalfe, 1997; Mutepfa *et al*., 1998; Rukuni *et al*., 2006). Hypotheses were then tested to assess the validity of this initial conclusion.

Table 7: Reduction of Each of the Complete Species Category

Ranch	Grazers	Browsers	Predators	Total
Senuko	872 (429.9)	838 (1307.5)	59 (31.6)	1769
Levanga	322(421.9)	1365 (1283.1)	49 (31.0)	1736
Mkwasine	481 (823.2)	2891 (2503.4)	15 (60.4)	3387
Total	1675	5094	123	6892

Source: Adapted from wildlife records for Senuko, Levanga and Mkwasine

On each ranch the projected number of animals over the years is higher than actual number of animals physically counted. Since the ranches faced different scales of resettlement, the Chi- square test can validate or invalidate influence of the fast track settlement program on numbers of animals.

1. H_0: Species reduction in each category does not depend on the ranch in question, that is the land resettlement program has not played a part in the reduction.
2. H_1: Species reduction in each category depends on the ranch, which is the land resettlement program has caused a reduction in animal numbers.
3. $\chi^2_{crit.} = 0.05$
4. Test Statistics : $\chi^2 = \frac{(o-e)^2}{e}$
5. Computation : χ^2 cal $= \frac{(872 - 42.9)^2}{42.9} + \frac{(838 - 1307.5)^2}{1307.5} + \frac{(59+31.6)^2}{31.6} + \frac{(322 - 421.9)^2}{421.9} + \frac{(1365 - 1283.1)^2}{1283.1} + \frac{(49 - 31.0)^2}{31.0} + \frac{(481 - 823.2)^2}{823.2} + \frac{(2891 - 2503.4)^2}{2503.4} + \frac{(15 - 60.4)^2}{60.4} = 780,6375955$

Therefore, χ^2 cal $= \underline{781}$

6. Decision rule : Reject H0 if χ^2 cal > χ^2 tab.

   d.f = χ^2 (r-1x c –1)

   d.f χ^2 (3-1x 3-1)

   d.f = χ^2 (4)

   There χ^2 tab = 9.5

Since χ^2 cal > χ^2 tab we reject H_0 and conclude that the 2000–2004 fast track land resettlement program might have caused the shortfalls in wildlife numbers in the Save Valley Conservancy, thereby negatively impacting wildlife biodiversity.

Owners of Senuko, Levanga and Mkwasine, maintained that poor government policies, poverty and population growth drove the new farmers to encroach into the conservancy. The ranch owners added that the launching of the fast track land resettlement program without proper planning was a major weakness. The overall result has been environmental degradation and displacement of wildlife in the conservancy. The owner of Senuko ranch, game rangers and wardens added that environmental and law enforcement agencies are not taking sufficient measures to deal with major negative environmental impacts of the fast track land reform program in the conservancy.

It seems there are no government sponsored programs to educate people on conservation of biodiversity as interviews with commercial farmers, the Ward councilor and the chief revealed. It also seems there are conflicts between the commercial farmers and the new farmers since the new farmers failed to attend meetings arranged by the conservancy owners to discuss the importance of wildlife. The commercial farmers also expressed concern when they explained that the peasant farmers claim to have open access to natural resources in the wildlife protected areas. This adds another dimension to the unsustainable use of natural resources in the study area and further confirms findings by earlier studies (Katerere *et al*., 1992; Matowanyika and Mandondo, 1994; Moyo, 1995; Mutepfa *et al*., 1998; Vudzijena, 1998; Chenje, 2000; Rukuni *et al*., 2006).

Based on the results of the research, it can be concluded that the 2000-2004 land resettlement program negatively impacted biodiversity in the study area. The study revealed that land resettlement in the Save Valley Conservancy without an Environmental Impact Assessment (EIA) resulted in loss of biodiversity. The demand for cropping land and construction materials, the ever rising demand for fuel wood for both household consumption and for sale, as well as poaching, veld fires, and the need for livestock rangelands have placed the conservancy under immense pressure. This has been worsened by the change in land tenure from privately owned commercial farms to leasehold farms very similar to the old communal areas, where the community owns the natural resources. The research findings also showed that current efforts at conservation of biodiversity depend primarily on state institutions. The new farmers lacked clarity on the role of the community in natural resources conservation, consequently hindering their full participation in the management of natural resources. With the no end in sight of the deepening political and humanitarian crisis, as well as the continuing meltdown of the Zimbabwean economy, a timely resolution of the biodiversity challenges in the Save Valley Conservancy and other conservancies seems unlikely.

RECOMMENDATIONS

In light of the above conclusions, the following recommendations are suggested to improve conservation of biodiversity in the Save Valley Conservancy and other wildlife areas that lost land to the fast track land resettlement program, and to any future program.

- The government should undertake an EIA before any new land resettlement program.
- The EIA process should be decentralized to Rural District Councils (RDCs) which are closer to the farming communities and play a pivotal role in land administration.
- It would be much easier for RDCs than the Government to incorporate and implement sound wildlife management strategies within their sub-council development plans in the communities they serve.
- The resettled farmers and Village Development Committees in resettlement areas should work together with conservancy owners towards protecting biodiversity in wildlife reserves and growing community woodlots.
- There is need to financially assist A1 subsistence farmers harness alternative cheaper, environmental friendly sources of energy such as solar , biogas and wind energy; and acquire energy saving wood fired stoves to reduce pressure on woodlands.
- Benefits from the preservation of biodiversity should be ploughed back to the community along the lines of CAMPFIRE.
- Planning for resettlement should include provision of basic infrastructure such as schools, roads, clinics, borehole water and modern brick houses instead of pole and dagga thatched huts which require constant repair thereby posing a perpetual biodiversity threat.
- It is vital that planning authorities should strive towards a zonation of resettlement schemes that maintain the exiting options for wildlife reserves. Only through appropriate zonation can the conflict between people and wildlife be reduced, and the wildlife industry allowed to benefit nearby communities and the country as a whole.
- The government should assist the new farmers in securing inputs, low interest loans and equipment. This will increase yields per hectare and improve the farmers' earnings so as to help eradicate poverty which is the major cause of biodiversity loss in Zimbabwe
- In line with one provision of the Environmental Management Act, EMA should organize and coordinate environmental education and awareness programs to increase community capacity to effectively tackle environmental issues, and foster development of 'values, attitudes, skills and behavior consistent with sustainable environmental management' (Environmental Management Act: Part II, Section 4, sub-section d).
- There is need for an integrated approach, involving EMA, environmental NGOs like Environment Africa, relevant government departments, local authorities and communities in semi-arid areas of Zimbabwe, to effectively address environmental issues. This will not only ensure environmental sustainability, but sustainable rural livelihoods as well.
- As Kanehe (2008) points out, communities should be allowed to own, use, develop and control the resources they possess by virtue of traditional ownership, with full legal recognition and protection from central government. This will hopefully encourage sustainable resource use and ensure sustainable rural livelihoods.

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