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Land Use and Savanna Woodland Management in Zimbabwe: Review Case Study of Save Valley, South-Eastern Zimbabwe

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Abstract

This study explored the role of local people of Mutema-Musikavanhu communities in Save Valley, south-eastern Zimbabwe and their respective local level institutional play in woodlands utilization and management. The aim of the study was to investigate the historical and present factors that influence the effectiveness of local community, protected areas and state institutions on land and woodlands management within the socio-ecological system in the Save Valley. The study was conducted in April 2018 to April 2019 and reviewed existing literature from published articles and national reports on the subject. Each document was examined and selected using the preview, question, read and summarize (PQRS) system outputs for review analysis. At the preview stage of PQRS, articles selection was based on the presence of at least two of the key words or phrases related to the subject content, which necessitated downloading of a document for literature review. A total of 67 articles were used for this review. After the PQRS, a meta-synthesis technique was used to evaluate, analyze and interpret the study findings from the literature review. The study recorded that there was excessive exploitation of timber from the indigenous woodlands of the Mutema-Musikavanhu communities in Save Valley that began in the 1890s to supply mines and the construction of railway infrastructure across south-eastern Zimbabwe. Timber exploitation has continued to date albeit changed use patterns, with timber currently used mainly for fuelwood in brickmaking, building construction and carpentry. Local traditional institutions that manage Save Valley's woodland resources are diffuse and need to be supported by the government. Furthermore, poor coordination of policy implementation and enforcement among Forestry and Agricultural government agencies cause conflicts in land use and woodland management. We recommend continuous monitoring of woodland resource

utilisation in communal and protected area in the Save Valley.

Keywords

Communal Area, Livelihood, Low-Veld Zimbabwe, Protected Area, Woody Plants

1. Introduction

Savanna woodlands are one of the world's most extensive biomes [1]. Woody vegetation constitutes most of the vast tropical woodland and dry forest formation in Africa, covering an estimated 2.7 million km^2 on nutrient-poor soils in regions receiving a mean annual rainfall of > 600 mm [2]. Woodland is defined as property claims to categories of trees and shrubs by people on land under various kinds of tenure [3]. Savanna woodlands comprise systems with a continuous herbaceous layer and a discontinuous woody stratum [4]. Accordingly, woody plants play important roles in the functioning of woodland ecosystems' service and goods provision to both wildlife and human livelihoods [5]. The impact of human activities was recognized much earlier on natural forest and woodlands than other ecosystems [6]. The first references can be traced back to Plato (ca 400 BC), who suggested that soil erosion and the drying up of springs could be due to deforestation [7]. Human activities, such as land use for agriculture, wildlife ranching and woodland exploitation has an impact on woody vegetation over the recent centuries [8].

Earlier study [9] pointed to the continuing importance of woodlands in Africa, citing the prediction of the International Energy Agency (IEA) [10] that biomass energy will still account for an estimated three quarters of total domestic energy consumption in Africa by 2030, and that the absolute number of people using wood fuel will rise by more than 40% during 2000 - 2030 to about 700 million people. Global consumption of fuel wood remains the dominant source of domestic fuel in some developing countries e.g. Zimbabwe, where alternative energy supply is limited and expensive for rural people [11] [12]. The International Union for Conservation of Nature (IUCN) in a General Statement on its African Special Project of the 1960s, stated that the accelerated rate of destruction of wild flora and habitat in Africa, was the most urgent international conservation problem of the present and future time [13]. It was suggested that the peoples of Africa and their administrations should be continuously encouraged to look favorably upon their unique inheritance of faunal and floral resources. This highlighted an important concern regarding the limited number of African systems and institutional structures engaged in woodlands conservation, and Zimbabwe was no exception [14] [15].

Disturbances on woody vegetation due to herbivory, fires, drought, frost, diseases and human activities are a cause for concern in the Save Valley, south-

eastern Zimbabwe and as recorded in earlier studies [16]-[21]. This article reviews land use and management of woodlands across the protected Save Valley Conservancy and the bordering communities of Mutema-Musikavanhu communal lands. The paper discusses the impact of human activities and influence of management in woodlands under a varying protection gradient that is communal and protected areas. Successful management of large areas of woody vegetation primarily depends on knowledge on policy and resource utilisation patterns [5] [22] [23]. In this review, a distinction was made regarding land use controls that relate to the use of wood resources from woodlands. The objectives of this review are i) to understand the role of local people on woodlands utilization and management in the Save Valley, and ii) to analyze factors influencing the effectiveness of local community, protected area management and state institutions on land and woodlands management within the socio-ecological system in the Save Valley. We also discuss the role of policy on local and national level processes on land use-land tenure and woodlands management in Zimbabwe.

2. Methods

2.1. Study Area

In this paper, the Save Valley, is defined as constituted of the protected area namely, Save Valley Conservancy (central coordinates 20˚22′S and 31˚56′E) and the bordering communities of Mutema-Musikavanhu communal areas of south-eastern Zimbabwe (**Figure 1**). This study area is located along Save River stretching from Birchenough Bridge in Chipinge District to Chiredzi District and incorporates part of the Great Limpopo Transfrontier Conservation Area [24]. Originally, Save Valley Conservancy was a co-operative structure comprising twenty-four private, individual cattle ranches with no marked buffer zone to border the adjacent rural settlement of Mutema-Musikavanhu communal areas. These connected cattle ranches were then converted into a single co-operatively managed commercial wildlife reserve, named Save Valley Conservancy in 1993 [25]. The perennial Save River borders the protected wildlife area of Save Valley Conservancy and the local communities, this river attracts wild animals that roam the area [20].

In this drought prone semi-arid area, irrigation agriculture, rain-fed dry land conservation agriculture and livestock production are ideal and common livelihoods activities across Mutema-Musikavanhu communal areas, with most people relying on small-scale commercial farming [20]. In Mutema-Musikavanhu communities, the population size increased to 29,163 people (7054 households, 26 to 81 people per km^2) at a growth rate of 2.4 for the period 1992 to 2012 [26]. In rural settlements, such a population growth combined with subsistence farming normally increase the need for more agricultural land at household level, leading to excessive pressure on vegetation and the depletion of natural resource stock in general [27] [28].

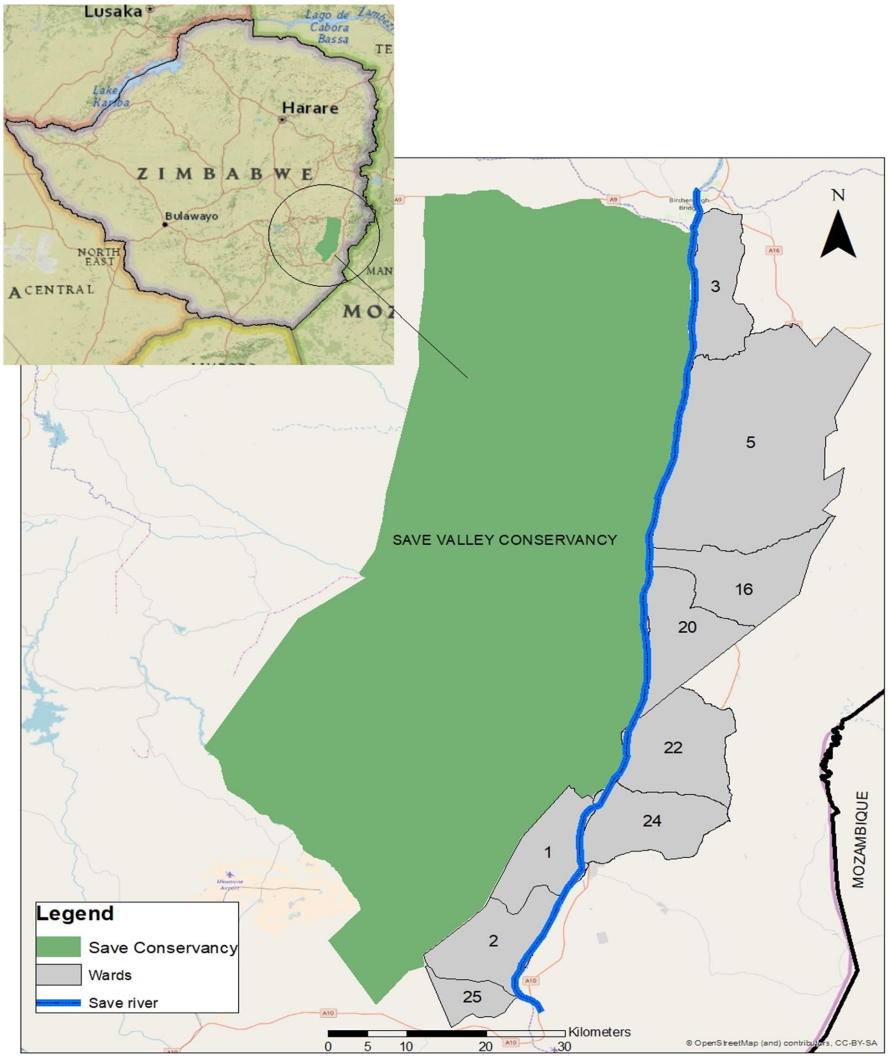

Figure 1. The study area of Save Valley south-eastern Zimbabwe, showing Save Valley Conservancy and the surrounding communal areas. NB: Ward 3 and 5 is Mutema communal area and Ward 1, 2, 16, 20, 22, 24 and 25 is Musikavanhu communal area [29].

The study area is in the semi-arid climate environment occurring at an elevation of 480 m - 620m above sea level, with deciduous woodland savanna of low and variable rainfall (400 mm – 650 mm per annum) and poor-quality soils [30]. The vegetation of Save Valley is typical of the semi-arid deciduous African savanna with Mopane (*Colophospermum mopane*) and Acacias (*Vachellia*) woodland being the common vegetation types [31] [32]. The Save Valley Conservancy has a diverse vertebrate fauna that consists of 89 species of mammals, 400 species of birds, 76 species of reptiles, 28 species of amphibians and 50 species of fish [17], [33]. The mammal fauna includes both large herbivores and carnivore species with the large herbivore dominated by Impala (*Aepyceros melampus*) which make up approximately 60% of the total biomass, followed by Burchell's Zebra (*Equus burchelli*), Wildebeest (*Connochaetes taurinus*) and Cape Buffalo (*Syncerus caffer*) which contribute 20% [34].

2.2. The Scope of the Study Review

Data collection for the study was done from April 2018 to April 2019. We approached this review from a historical perspective [35] to allow for the tracking and evaluation of cultural, legal institutional framework for land use and woodland management in communal (Mutema-Musikavanhu communities) and protected area (Save Valley Conservancy). The historical perspective allowed us to trace the developments in the mainstreaming of land use and woodlands management in the Save Valley and how it is related to the Zimbabwean national scenario. Land use and savanna woodland management in the Save Valley, was reviewed mainly based on research articles drawn from Zimbabwe, where the authors are more familiar with the study area. The researchers are familiar with the study area from previous related socio-ecological research (e.g. [16] [18]-[20] [24] [36] and the study area appeared appropriate because it had experienced spontaneous encroachment of human settlement onto protected woodland areas [21] [34].

2.3. Literature Review Process and Assessment Framework

Following earlier studies [24] [37], this review focused on reports of original research articles [see reference list]. To access and collect information, peer-reviewed and published research articles obtained through internet sources, books and reports were examined. Following the method of a related study [24], internet scholarly search engines were used with inquiry guided by inputting the following words or phrases, "Zimbabwe land tenure", "communal woodland utilization and management in Save Valley, Zimbabwe", "woodland management in Save Valley protected areas" "woodland utilization", "state actors in woodland management in Zimbabwe", "non-state actors in woodland management in Zimbabwe" "indigenous peoples". To ensure relevance of gathered information, each article, especially the abstract, was examined using the preview, question, read and summarize (PQRS) system outputs for review analysis [38]. At the preview stage of PQRS, articles whose abstracts were considered relevant to the study objectives were selected for literature review. Selection was based on the presence of at least two of the key words, phrases or similar wordings related to the subject content, which necessitated downloading of a document for literature review. Over 64 peer reviewed articles were used for this review.

2.4. Data Analysis

After the preview stage of PQRS, a meta-synthesis technique was used to evaluate, analyze and interpret the findings from the literature review. According to an earlier study [39], a meta-synthesis involves analyzing and synthesizing key elements in each study and transforming the findings into new conceptualizations and interpretations. The downloaded reference articles were read through to make an assessment and identification of common core elements and emerging themes [40]. To assist in classifying and grouping articles, subject content was grouped into components for analysis based on the two objectives of the review study, i)

indigenous people, land tenure-land use systems (communal and protected) and woodland resource use, woodland management, human settlement and encroachment onto protected areas, local level institutional (traditional and state actors) framework and its influence on land and woodlands management, and ii) undertaking a more systematic critical analysis and review of the subject content, and then make a summary of the findings [24]. Using this analysis, findings were discussed based on the afore stated study objectives.

3. Findings and Discussion

3.1. Woodland Management in Save Valley, South-Eastern Zimbabwe

Woodland ecosystems in Zimbabwe exist under different land tenure systems [41]. The protected area estates like Save Valley Conservancy, falls under the state agencies namely, the Zimbabwe Parks and Wildlife Management Authority and the Forestry Commission of Zimbabwe. The savanna woodland cover an area of about 2 million ha across south-eastern Zimbabwe [41], with 638,000 ha being communal areas; 343,000 ha under private lands (especially the large scale commercial farms), 568,000 ha is in the Zimbabwe National Parks and commercial wildlife areas (where commercial logging is prohibited) and 439,000 ha is on gazetted natural forest areas [42]. The woodlands within the Mutema-Musikavanhu communities are under the jurisdiction of the Chipinge Rural District Council and the Ministry of Local Government, Zimbabwe. The role of local people and threats to woodlands and biodiversity in the Save Valley area were recorded in year 2000 during the development process of the National Biodiversity Strategy Action Plan (NBSAP) of Zimbabwe [41] [42]. Critical threats to woodlands and biodiversity conservation and the underlying causes of degradation as recorded by NBSAP in 2000 and updated by the present study findings, are presented in **Table 1**, highlighting the role and impact of local people in shaping woodland status in the Save Valley.

Fuel wood demand in the region was reported to be on the increase due to a variety of factors which include escalating national energy cost, rapid population growth, persistent poverty and lack of realistic energy alternatives [36]. An earlier study recorded that 31% of Zimbabwe's total energy consumption is wood fuel, with 80% of the energy demands of communal areas being met by wood fuel [41]. Therefore, preferred hard wood species are being rapidly harvested for firewood and other benefits that the local people derive from woodland resources. In the Save Valley, natural forests and woodlands are the primary energy sources in the form of fuelwood and a source of commercial timber, with hardwood species such as Kiaat (*Pterocarpus angolensis*), Chamfuta (*Afzelia quanzensis*), African blackwood (*Dalbergia melanoxylon*), Leadwood (*Combretum imberbe*), African ebony (*Diospyros mespiliformis*), African teak (*Pericopsis elata*) and Red Mahogany (*Khaya anthotheca*) being threatened with overharvesting [43] [44]. It was noted that during Zimbabwe's pre-colonial period, illegal wood harvesting in protected

areas was minimal across Save Valley area, [45] however, there was a drastic rise in illegal wood harvesting, woodlands clearance for agriculture and wood related industries during the colonial and post-colonial periods (1890s onward), as triggered by commercial industrialisation [27] [41].

Table 1. Summary of status, importance and threats to woodland ecosystems in Save Valley (following the framework of earlier studies [24], [41]).

Woodland ecosystem and importance to biodiversity conservation	Threat to woodlands	Underlying causes of woodland degradation	Impact
southern Africa bushveld; -protected area provides wildlife and woodlands protection in Save Valley Conservancy; forms part of the Greater Limpopo and Limpopo Shashe Transfrontier Conservation Areas (TFCAs) Communal woodlands of Mutema-Musikavanhu communal areas in south-eastern Zimbabwe; -dominated by mega herbivores -dominated by woodlands -high species richness and diversity of woody plants	-conversion to agricultural land -pollution; -unsustainable harvesting of timber -bush encroachment by invasive species like tick berry (*Lantana camara*) -excessive herbivory due to overpopulation of herbivores -veld fires -climate change and high frequencies of drought -harvesting of non-timber forest products (NTFPs), -woodland loss	-agriculture expansion converting woodlands into cultivation lands -illegal settlements -human encroachment into protected areas -deforestation -increased frequency and intensity of forest and veld fires resulting in loss of vegetation cover and biodiversity -increased reliance on natural resources (trees and forests) for livelihoods -growing market for firewood in urban centres due to limited grid electricity accessibility and other economic challenges -unfavorable agriculture outputs and market prices, resulting in more people unsustainably harvesting wood resources as an alternative income source.	-habitat fragmentation and woodland degradation -reduced woodland ecosystem services and declining human well-being -biodiversity loss -increased conflict between humans and wildlife at interface -extinction or extirpation of threatened species -increased vulnerability for species, with low productivity and population numbers -restricted and patchy habitats -limited ecosystem ranges -Woodlands converted into scrublands

It is projected that a few of Zimbabwe's protected natural forests and woodlands will survive to the end of the 21st century in their current pristine state [22] [41], while the communal woodlands with open access use are at risk of degradation in the Save Valley [46] [47]. In south-eastern Zimbabwe, exploitation of timber from local woodlands which were not gazetted by 1923, began in the 1890s to supply the mines and rails of the railway lines established by the white settlers who established the Pioneer Column route of colonizing the present country Zimbabwe [25] [42] [48]. However, this operation became so extensive that regulation became necessary, leading to the enactment of the Forest Act in 1949 [49]. Despite a lack of adequate data, it is reported that woodlands in south-eastern Zimbabwe were over-exploited and by 1977, timber demand had already exceeded supply [25]. The woodlands of the Save Valley provide a wide range of products supporting several woodland based livelihoods activities which include commercial hardwood timber, fuel wood, small artisan crafts, fodder, wild fruits, honey, mushrooms, insects, bark for rope, medicines, leaf litter and gum [15]. An estimated gross value from harvesting of woodland resource products in Zimbabwe was estimated US$110 million a year [2]. Woodland resource harvesting is a significant component of rural livelihood strategies in both communal and resettled areas in

the Save Valley given the high prices of agricultural products, unreliable rainfall and unemployment [26].

The Save Valley area is of global significance for the mega-fauna and flora found across the region [34]. However, over the past three decades, rapid land use changes have substantially reduced wildlife habitats and woodlands in this area [19] [28] [44]. Land use and land cover has changed from wildlife protected area to small scale farming in parts of the protected Save Valley Conservancy, following the Zimbabwe government resettlement programme post 2000 [27] [48]. With the onset of the Fast Track Land Resettlement Programme (FTLRP) in Zimbabwe, villagers moved and resettled into parts of the protected Save Valley Conservancy clearing woodland habitats for agriculture and human settlement [19] [28]. Due to the poor nutrient content of the soils in Save Valley Conservancy, resettled farmers practiced slash and burn agriculture to boost yields, resulting in increasing woodland clearance [28]. There is human occupation in the south-eastern parts of Save Valley Conservancy (Mkwasine and parts of Senuko and Levanga ranches) [21] [48] and such human settlement in protected areas create habitat fragmentation which threatens wildlife and biodiversity persistence. The encroaching human resettlement onto protected areas further decreases the home range of large herbivores thereby triggering over-browsing [34] [50]. With reported high density of elephants (about 2 elephants per km^2) in Save Valley Conservancy [33], woodland degradation is likely to persist. Elephants are known to cause top-kill and die-back of trees and shrubs due to excessive herbivory which can degrade woodlands and convert them into scrublands [34].

As human population continues to increase (46 people per km^2 compared to national average of 33 people per km^2) in Save Valley [26] more woodlands are likely to be opened for settlement and cultivation [21]. The 1993 transition to a conservation frontier status of Save Valley Conservancy had several implications. First, local people from Mutema-Musikavanhu communities resettled on the southern part of Save Valley Conservancy by the 2000s with the onset of the Zimbabwe Land Reform Programme [48]. These local people reportedly had intentions of finding enough space to create an idealized settlement model of their areas of origin [51] as they unilaterally encroached for human settlement on a protected area. Secondly, the local people may have assumed that land and woodland resources were abundant across Save Valley Conservancy, which determined their behavior based on the social exchange theory to invade and resettle on a protected area, even though there was evidence to the contrary [27] [41]. For instance, for the period 1990 to the 2040 s, it is predicted that human activities and excessive elephant herbivory will reduce woodland cover by 46% in Save Valley Conservancy [21]. Thus, there are problems of human encroachment on protected areas in Save Valley, south-eastern of Zimbabwe, which led to the clearance of woodlands to establish agricultural fields and homesteads [19] [48]. Furthermore, residents form neighbouring communal lands poach animal and wood resources from Save Valley Conservancy, claiming historical usage rights as indigenous peo-

ple who were earlier relocated by the white settlers during the colonial era to pave way for establishment of the same protected area [28] [51].

3.2. Local Level Institutional Control on Woodlands Management in Save Valley

Traditional leadership are custodians of communal land with the powers vested in them by the Traditional Leaders Act of Zimbabwe and they play prominent roles in decision making on communal woodland governance. Regarding regulation, access to woodland resources, monitoring, control and punishment of offenders, traditional leaders have full privileges of making decisions and are also in charge of their enforcement [15]. For example, special hardwood species like African mahogany (*Khaya anthotheca*), must only be cut after seeking permission form the traditional leaders, even though the consent was reported tainted with corruption or nepotism [18] [26]. Traditional access to woodland resources is deeply etched into African culture and the Mutema-Musikavanhu communities in Save Valley are characterized by sacred controls enforced by customary or traditional institutions and practices as defined in earlier studies [51] [52]. Sacred controls are defined as norms of wood resource use and protection that are based in folklore-traditional religious beliefs or indigenous ecological knowledge systems that are enforced by individual internalization of the norms, community sanction or by religious or traditional leaders [53].

It was noted, from literature, that local people only cut trees or shrubs when they intended to use them and would not do so where there is no use except when clearing fields for cultivation [15]. The idea that a tree is only cut for a purpose has been linked to the fact that people of the Mutema-Musikavanhu communities show that they are stewards of woodlands [52]. This cognitive set also applies to indigenous wild fruit trees such as Bird plum (*Berchemia discolor*), Baobab (*Adansonia digitata*) and African ebony (*Diospyros mespiliformis*) which occur in large numbers in the Save Valley [15] [36]. Live trees on sacred places like graveyards are not cut (personal observation: Clayton Mashapa, April 2018). Such natural resource conservation practices that arise from a combination of common sense and preference as part of indigenous conservation knowledge set embedded in the local traditional culture (or more crudely cultural baggage) of woodland resource management around sacred land. In this sense, a frontier can be capitalized as a force for cultural-historical continuity of indigenous knowledge and ecological woodland conservatism [53]. The existence of the cultural controls suggests that local people of the Mutema-Musikavanhu communities have indigenous ecological knowledge systems which they apply in land use and woodland conservation. However, traditional authority is unrecognized in protected areas like Save Valley Conservancy and large-scale commercial farms in south-east Zimbabwe.

There are several local level state institutions responsible for monitoring woodland resource use in the Save Valley. A common characteristic to all the state institutions is that they are imposed on the community by government bodies and that they all depend on the selected Village Development Committees (VIDCOs)

and traditional leaders such as village heads to execute their functions [54]. The Environmental Management Agency (EMA) in collaboration with the Chipinge Rural District Council work with the local VIDCOs and traditional leaders to encourage local people to preserve their environment with each VIDCO having at least two natural resource overseers nominated by local people. The duties of natural resource overseers of the VIDCO include enforcing conservation of woodlands, soil, water, wildlife, control of problem animals, assessing crop damages, control of snaring, hunting and fishing as communicated to local communal residents [55]. However, the relationship between natural resource overseers of the local VIDCOs and game rangers of the protected Save Valley Conservancy lacks integration and there is no collaboration between these actors of the woodland conservation value chain [15]. Save Valley Conservancy game rangers embrace conservation, management and non-consumptive responsibilities within the protected area game ranch unlike the VIDCOs natural resource overseers who are conservative within the communal area domain of communal woodland management [56].

3.3. The National Government and its Institutional Controls on Land and Woodlands Management in the Save Valley

The review highlights the preoccupations of government agencies which did not give sufficient attention to natural forest and woodland management yet much of the livelihood components in Zimbabwe had implications for the status of woodlands. The government is represented by extension personnel, district administration, the rural district council, and the various institutions emanating from the President's Office directive on Local Government through the Provincial Administration and Provincial Governorships of 1984 [54]. In theory, community development plans are channeled up to the hierarchy of development committees where decisions are made on what needs implementing and directives are sent back for implementation. In practice, the lowest structure of VIDCOs do not have operating budgets or capacity on legal matters, therefore their natural resource and woodland management plans are seldom successfully implemented despite their importance. The VIDCOs are more appropriately seen as agents of the government because they have limited autonomy beyond serving as conduits for ideas emanating from the local government despite being comprised of residents [54]. The political ties of VIDCOs to the state government limit their independence; these issues have been discussed by other scholars e.g. [54] [57]. Community leaders and VIDCOs across Save Valley, enforce the set rules and regulations on communal woodland management, however, sometimes they manipulate state power for their own ends of excessive benefits from woodland resources even if it means tolerating activities that cause woodlands degradation [15].

The study recorded how the Zimbabwe's land resettlement program impacted on the status of woodlands across Save Valley. This resettlement program was adopted post 2000, aimed at redressing the historic inequitable distribution of land in Zimbabwe [27]. The FTLRP involved acquiring land from the large-scale

commercial sector and redistributing it to small scale farmers from the communal lands [27] [58]. The program sought to redress the colonial imbalances of land holdings between the communal and commercial sectors [59]. However, as people moved onto the commercial wildlife protected areas, allegedly as new settlers, some had the intention of looting resources from the protected areas [27] [28] [44] [59] and wood resources were not spared. The District Administration normally arbitrates where government extension workers face challenges with mediation regarding illegal land acquisition or excessive woodland utilization. However, the state government functionaries are more concerned with maintaining their relative political power and control over the land with populist decisions at the expense of sustainable land use and woodlands conservation [15]. Surprisingly, a regime of rigid control over land settlement is coupled with a *laissez faire* attitude to the use of wood resources and woodlands management even though the Rural District Council could invoke the Natural Resources Act, the Communal Forest Produce Act, the Communal Land Model (Land Use and Conservation) by-laws of 1985 and associated legislation to effectively manage and conserve woodlands in Zimbabwe.

The *laissez faire* attitude taken by the local government authorities and institutions about woodlands management in the study area could be detrimental to the effectiveness of local traditional institutions on the management of natural forests and woodlands [35]. The land-use planning and land reform programme in the Save Valley focused on land redistribution for agricultural purposes, but woodland management was given less attention [49]. The major concern on the land redistribution aspects of the FTLRP was how land and woodlands could have been sustainably exploited in the Save Valley. This is an important consideration given the fact that inappropriate communal farming systems and woodlands degradation in the communal lands of the Save River catchment across Save Valley are reported to have caused soil loss ranging from 40 to 100 tons per hectare annually [60] [61]. The provision of government extension services largely serves the agricultural sector compared to woodland management and wildlife sectors [27] [41]. The content of community extension messages has less focus on management of natural resources or woodland conservation. Extension works also support some activities that rely on the exploitation of woodlands e.g. tobacco and grain growing which requires the building of tobacco barns, granary from wood, respectively. Little effort is made to control such exploitation of woodlands by farmers, leading to non-compliance farmers to the rules imposed by the VIDCOs and traditional leaders for woodlands conservation [62].

3.4. National Biodiversity Strategy and Woodland Management in Zimbabwe

Zimbabwe's Department of Agriculture has a long-term development planning framework spanning 20 years, in contrast with all the other sectoral government ministries or departments and cross-sectorial plans for the forestry sector that have short-term plan [27] [42]. The Zimbabwe Comprehensive Agricultural Pol-

icy Framework 2012-2032 recognizes the need for compliance with intellectual property rights requirements and international and local sanitary and phytosanitary standards. Agricultural policies recognize the value of agro-ecological zones and recommend their re-assessment in response to climate change impacts [27]. This is all evidence of a well-planned long-term agriculture development strategy for Zimbabwe with a less pronounced plan for natural forestry and woodland management and conservation. However, the short-term planning phases within the forestry sector may not allow for an adequate assessment of the impacts of these plans and polices on viability of woodland ecosystems and human livelihoods in the long term.

As for the natural resources and forestry sector in Zimbabwe, intra-sectoral government agency coordination on natural forests and woodlands conservation issues is largely weak [41]. There is little coordination of conservation issues at national level as functions are split between the Biodiversity Office in the Department of Environment, Water and Climate, and the Environmental Management Agency [27] [41]. This is also reflected in the lack of harmonized reporting and monitoring on multilateral environmental agreements to leverage resources, especially with the United Nations (UN) Convention to Combat Desertification (UNCCD), the Convention on Wetlands of International Importance (also known as the Ramsar Convention), the UN Framework Convention on Climate Change (UNFCCC), the UN Convention on Biological Diversity (UNCBD) and the Convention on International Trade in Endangered Species (CITES) [63]. Natural forest, woodlands and biodiversity conservation has not been mainstreamed into the Department of Environment, Water and Climate as the Biodiversity Office in Zimbabwe is considered a project that is externally funded [27]. This has led in part to data and other information on woodlands and biodiversity becoming outdated, unavailable or scattered across various institutions [41].

Zimbabwe is party to the United Nations Convention on Biological Diversity (UNCBD) and is obligated to implement the provisions of the convention [41]. In line with this membership, Zimbabwe developed its first national biodiversity strategy and action plan (NBSAP) in 1998, which covered the period 2000-2010 [41]. In 2013, Zimbabwe embarked on a process of reviewing the NBSAP and aligning it with the UNCBD Strategic Plan of 2011-2020 which emphasizes the communication, education and public awareness and the ecosystems approach, including the value of ecosystems, in the development of NBSAPs [27]. The NBSAP, through its strategic objectives, was designed to contribute to the national development targets in the economic blueprint for the period 2013 to 2018 of the Zimbabwe Agenda for Sustainable Social Economic Transformation (ZimAsset) [64], but little has been achieved by the time of this review, mainly due to limited national funding of ZimAsset [26]. There is need for Zimbabwe's national commitment with funding for government extension service delivery in the forestry sector to utilize traditional indigenous ecological knowledge, research, technology, innovations and best practices to protect the environment, conserve and sus-

tainably use woodland ecosystems to benefit present and future generations [29].

4. Conclusion

This study explored the role of Mutema-Musikavanhu communities and Save Valley Conservancy in south-eastern Zimbabwe and their respective local level institutional play in woodlands management. The role of people is characterized by their intensive utilization of woodland resources to meet their demand for fuel wood, timber, land for agricultural expansion and settlements, together with herbivory, likely causing woodland degradation across Save Valley. The drivers of woodland degradation include the failure of government institutions to adequately involve local traditional institutions and other stakeholders in the management of the woodland resources in the Save Valley. Government agencies across the study area mainly focus on agricultural extension work while little attention is given to woodland management in communal areas or protected areas. We recommend strengthening the national Forest Policy so that it is mainstreamed into all sectors and incorporated into the national accounting and reporting system. This calls for the development and implementation of a comprehensive communication, public awareness strategy on the conservation and sustainable utilization of both communal and protected area woodlands.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

[1] Williams, R.J., Duff, G.A., Bowman, D.M.J.S. and Cook, G.D. (1996) Variation in the Composition and Structure of Tropical Savannas as a Function of Rainfall and Soil Texture along a Large-Scale Climatic Gradient in the Northern Territory, Australia. *Journal of Biogeography*, **23**, 747-756. https://doi.org/10.1111/j.1365-2699.1996.tb00036.x

[2] Campbell, B. (1996) The Miombo in Transition: Woodlands and Welfare in Africa. Center for International Forest Research (CIFOR).

[3] Fortmann, L and Nhira, C. (1992) Local Management of Trees and Woodland Resources in Zimbabwe: A Tenurial Niche Approach. Oxford Forestry Institute Occasional Papers, Department of Plant Sciences, University of Oxford.

[4] Ryan, C.M. and Williams, M. (2011) How Does Fire Intensity and Frequency Affect Miombo Woodland Tree Populations and Biomass? *Ecological Applications*, **21**, 48-60. https://doi.org/10.1890/09-1489.1

[5] Tesfaye, S.S. (2017) Assessment of Local Community Perception of and Attitude towards Participatory Forest Management (PFM) System and Its Implications for Sustainability of Forest Condition and Livelihoods: The Case of Chilimo-Gaji Forest in Dendi District, West Shewa Zone, Oromia, Ethiopia. *Journal of Earth Science and*

Climate Change, **8**, 1-10.

[6] Clements, F.E. (1916) Plant Succession: An Analysis of the Development of Vegetation. *Carnegie Institute of Washington Publication*, **242**, 1-512. http://dx.doi.org/10.5962/bhl.title.56234

[7] Daily, G.C. (1997) Nature's Services: Societal Dependence on Natural Ecosystems. Island Press.

[8] Dezécache, C., Salles, J., Vieilledent, G. and Hérault, B. (2017) Moving Forward Socio-Economically Focused Models of Deforestation. *Global Change Biology*, **23**, 3484-3500. https://doi.org/10.1111/gcb.13611

[9] Arnold, J.E.M., Köhlin, G. and Persson, R. (2006) Woodfuels, Livelihoods, and Policy Interventions: Changing Perspectives. *World Development*, **34**, 596-611. https://doi.org/10.1016/j.worlddev.2005.08.008

[10] International Energy Agency (IEA) (2002) Energy and Poverty. Chapter 13. In World Energy Outlook 2002. Organisation for Economic Co-Operation and Development (OECD) Paris, 530 p.

[11] Muboko, N., Mushonga, M.R., Chibuwe, N., Mashapa, C. and Gandiwa, E. (2013) Woody Vegetation Structure and Composition in Mapembe Nature Reserve, Eastern Zimbabwe. *Journal of Applied Science and Environmental Management*, **17**, 475-481.

[12] Muboko, N., Chigumira, T., Mashapa, C., Gandiwa, E., Chibememe, G. and Muposhi, V.K. (2014) Impacts of Wood Poaching on Vegetation Structure and Composition in Mukuvisi Woodland, Zimbabwe. *Journal of Environmental Protection*, **5**, 156-163. https://doi.org/10.4236/jep.2014.52019

[13] Worthington, E.B. and Treichel, G. (1961) General Statement IUCN's African Special Project (ASP) 1960-63 and Second Progress Report on the African Special Project from the Advisory Committee—February 1961 (Revised March). 1961 *CCTA/IUCN Symposium on the Conservation of Nature and Natural Resources in Modern African States*, Arusha, 5-12 September 1961, 1.

[14] International Union of Conservation and Nature (IUCN) (2000) Guidelines for the Prevention of Biodiversity Loss Caused by Alien Invasive Species. 51*st Meeting of the IUCN Council*, Gland, 9 February 2000, 1-25.

[15] Mashapa, C., Gandiwa, E. and Muboko, N. (2019) Socio-Economic and Ecological Outcomes of Woodland Management in Mutema-Musikavanhu Communal Areas in Save Valley, Southeastern Lowveld of Zimbabwe. *Journal of Animal and Plant Sciences*, **29**, 1075-1087.

[16] Gandiwa, E. and Kativu, S. (2009) Influence of Fire Frequency on *Colophospermum mopane* and *Combretum apiculatum* Woodland Structure and Composition in Northern Gonarezhou National Park, Zimbabwe. *Koedoe*, **51**, Article No. 685. https://doi.org/10.4102/koedoe.v51i1.685

[17] Dunham, K.M. (2002) Aerial Census of Elephants and other Large Herbivores in the Save Valley Conservancy, Zimbabwe: 2001. Occasional Paper 5. WWF-Southern Africa Regional Programme Office.

[18] Mashapa, C., Nyabawa, P., Zisadza-Gandiwa, P., Muvengwi, J., Kativu, S. and Gandiwa, E. (2014) Status of African Baobab (*Adansonia digitata*) across Gonarezhou National Park, Zimbabwe. *Journal of Applied Sciences and Environmental Management*, **18**, 129-133. https://doi.org/10.4314/jasem.v18i1.18

[19] Zisadza-Gandiwa, P., Gandiwa, E., Mashapa, C., Mpofu, E. and Muboko, N. (2014) Land Use Change in Chiredzi River Conservancy, Southeast Zimbabwe: Implications for Wildlife Conservation. In: Mararike, C.G., Ed., Land: *An Empowerment Asset for Africa*: *The Human Factor Perspective*, University of Zimbabwe Publications, 266-277.

[20] Mhuriro-Mashapa, P., Mwakiwa, E. and Mashapa, C. (2018) Socio-Economic Impact of Human-Wildlife Conflicts on Agriculture-Based Livelihood in the Periphery of Save Valley Conservancy, Southern Zimbabwe. *Journal of Animal and Plant Sciences*, **28**, 903-914.

[21] Mashapa, C., Gandiwa, E., Muboko, N. and Muhriro-Mashapa, P. (2020) Land Use and Land Cover Changes in a Human-Wildlife Mediated Landscape of Save Valley Conservancy, South-Eastern Lowveld of Zimbabwe. *The Journal of Animal and Plant Sciences*, **31**, 583-595. https://doi.org/10.36899/japs.2021.2.0246

[22] Magadza, C., Coulson, I. and Tafangenyasha, C. (1993) Ecology of Gonarezhou National Park. In: Magadza, C., Ed., *Gonarezhou National Park Management Planning Programme Background Data Reports*, Department of National Parks and Wildlife Management, 1.1-1.42.

[23] Langat, D.K., Maranga, E.K., Aboud, A.A. and Cheboiwo, J.K. (2016) Role of Forest Resources to Local Livelihoods: The Case of East Mau Forest Ecosystem, Kenya. *International Journal of Forestry Research*, **2016**, Article ID: 4537354. https://doi.org/10.1155/2016/4537354

[24] Muboko, N. (2017) The Role of Transfrontier Conservation Areas and Their Institutional Framework in Natural Resource-Based Conflict Management: A Review. *Journal of Sustainable Forestry*, **36**, 583-603. https://doi.org/10.1080/10549811.2017.1320224

[25] Wels, H. (2003) Private Wildlife Conservation in Zimbabwe: Joint Ventures and Reciprocity. BRILL. https://doi.org/10.1163/9789004491755

[26] ZimStat (Zimbabwe National Statistical Agency) (2013) Poverty Income Consumption and Expenditure Survey, 2011/12.

[27] Rukuni, M., Tawonezvi, P.C., Eicher, C., Munyuki-Hungwe, M. and Matondi, P. (2006) Zimbabwe's Agricultural Revolution Revisited. University of Zimbabwe Publications.

[28] Kahuni, T., Zisadza-Gandiwa, P., Mhlanga, W., Libombo, E., Mashapa, C., Muboko, N. and Gandiwa, E. (2014) Are Fences Effective in Combating Human-Wildlife Conflicts around Protected Areas in Zimbabwe: The Case Study of Local Communities Bordering Northern Gonarezhou National Park, Zimbabwe. In: Mararike, C.G., Ed., *Land*: *An Empowerment Asset for Africa*: *The Human Factor Perspective*, University of Zimbabwe Publications, 278-287.

[29] Mashapa, C. (2018) Human Livelihoods and Sustainable Conservation: Herbivory and Anthropogenic Impact of Woody Vegetation and Ecosystem Goods in Save Valley, Southeastern lowveld of Zimbabwe. Ph.D. Thesis, Chinhoyi University of Technology.

[30] Poshiwa, X., Groeneveld, R.A., Heitkönig, I.M.A., Prins, H.H.T. and van Ierland, E.C. (2013) Wildlife as Insurance against Rainfall Fluctuations in a Semi-Arid Savanna Setting of Southeastern Zimbabwe. *Tropical Conservation Science*, **6**, 108-125. https://doi.org/10.1177/194008291300600102

[31] Cunliffe, R., Muller, T. and Mapaura, A. (2012) Vegetation Survey of Gonarezhou National Park, Zimbabwe. Zimbabwe Parks and Wildlife Management Authority.

[32] Seydack, A.H., Grant, C.C., Smit, I.P., Vermeulen, W.J., Baard, J. and Zambatis, N. (2012) Large Herbivore Population Performance and Climate in a South African Semi-Arid Savanna. *Koedoe*, **54**, a1047. https://doi.org/10.4102/koedoe.v54i1.1047

[33] Dunham, K.M. and van der Westhuizen, H.F. (2015) Aerial Survey of Elephants and other Large Herbivores in Gonarezhou National Park and Save Valley Conservancy, Harare. Zimbabwe Parks and Wildlife Management Authority/Frankfurt Zoological Society.

[34] ZPWMA (Zimbabwe Parks and Wildlife Management Authority) (2011) Gonarezhou National Park General Management Plan (2011-2021). Ministry of Environment and Natural Resources Management Harare.

[35] Gandiwa, E., Zisadza-Gandiwa, P., Mashapa, C., Libombo, E. and Muboko, N. (2014) An Assessment of Local People's Participation in Natural Resources Conservation in Southern Zimbabwe. *E3 Journal of Environmental Research and Management*, **5**, 42-46.

[36] Mashapa, C., Gandiwa, E., Mhuriro-Mashapa, P. and Zisadza-Gandiwa, P. (2014) Increasing Demand on Natural Forest Products in Urban and Peri-Urban Areas of Mutare, Eastern Zimbabwe: Implications for Sustainable Natural Resources Management. *Nature and Faune*, **28**, 42-48.

[37] Spellerberg, I.F. (1998) Ecological Effects of Roads and Traffic: A Literature Review. *Global Ecology and Biogeography Letters*, **7**, 317-333. https://doi.org/10.2307/2997681

[38] Cohen, G. (1990) Memory. In: Roth, I., Ed., *The Open University's Introduction to Psychology*, Lawrence Erlbaum, 570-620.

[39] Polit, D. and Beck, C. (2006) Essentials of Nursing Research: Methods, Appraisals and Utilization. 6th Edition, Lippincott.

[40] Cronin, P., Ryan, F. and Coughlan, M. (2008) Undertaking a Literature Review: A Step-By-Step Approach. *British Journal of Nursing*, **17**, 38-43. https://doi.org/10.12968/bjon.2008.17.1.28059

[41] Shumba, E.M. (2001) Integration of Biodiversity in National Forestry Planning Programme. *An International Workshop Integration of Biodiversity in National Forestry Planning Programme*, *CIFOR Headquarters*, Bogor, 13-16 August 2001, 1-35.

[42] GoZ (Government of Zimbabwe) (2010) Fourth National Report to the Convention on Biological Diversity. Ministry of Environment and Natural Resources Management. https://www.cbd.int/doc/world/zw/zw-nr-04-en.pdf

[43] McCullum, H. (2000) Biodiversity of Indigenous Forests and Woodlands in Southern Africa. SADC/IUCN/SARDC.

[44] Pole, A. (2006) Management Plan for the Save Valley Conservancy, Chipinge, Zimbabwe. https://scholar.google.com/scholar_lookup?title=Management%20Plan%20for%20the%20Save%20Valley%20Conservancy&publication_year=2006&author=A.%20Pole

[45] Mamimine, W., & Mandiregerei, P. (2001) Traditional and Modern Institution of Governments in Community Based Natural Resources Management. Commons Southern Africa Occasional Paper Series No. 5. Harare: CASS.

[46] Hardin, G. (1968) The Tragedy of the Commons. *Science*, **162**, 1243-1248. https://doi.org/10.1126/science.162.3859.1243

[47] Gandiwa, E. (2011) Importance of Dry Savanna Woodlands in Rural Livelihoods and Wildlife Conservation in Southeastern Zimbabwe. *Nature and Faune*, **26**, 60-66.

[48] Scoones, I., Marongwe, N., Mavedzenge, B., Mahenehene, J., Murimbarimba, F. and Sekume, C. (2010) Zimbabwe's Land Reform: Myths and Realities. James Currey.

[49] McGregor, J. (1991) Woodland Resources: Ecology, Policy and Ideology: An Historical Case Study of Woodland Use in Shurugwi Communal area, Zimbabwe. Doctoral Thesis, Loughborough University of Technology.

[50] Vudzijena, V. (1998) Land Reform and Community Based Natural Resource Management in Zimbabwe. In: Mutepfa, F., *et al.*, Eds., *Enhancing Land Reform Strategies and Community Based Natural Resources Management*, ZERO—Regional Environ-

ment Organization, 76-90.

[51] Chibemene, G. (2006) Access and Benefit Sharing Options: Enhancing Biodiversity Conservation and Livelihoods of Local Communities. Master's Thesis, Durrell Institute of Conservation and Ecology, University of Kent.

[52] Nhira, C. and Fortmann, L. (1993) Local Woodland Management: Realities at the Grass Roots. In: Bradley, P.N. and Mcnamara, K., Eds., *Living with Trees*: *Policies for Forestry Management in Zimbabwe*, The World Bank, 139-156.

[53] Kopytoff, I. (1987) The Internal African Frontier: The Making of African Political Culture. In: Kopytoff, I., Ed., *The African Frontier*: *The Reproduction of Traditional African Societies*, Indiana University Press, 3-84.

[54] Murombedzi, J.C. (1992) The Need for Appropriate Local Level Common Property Resource Management Institutions in Communal Tenure Regimes. In: Cousins, B., Ed., *Institutional Dynamics in Communal Grazing Regimes in Southern Africa*: *Proceedings of a Workshop Held at the University of Zimbabwe* 10*th to* 12*th December* 1990, Centre for Applied Social Sciences, 1-6.

[55] Mhuriro-Mashapa, P., Mwakiwa, E. and Mashapa, C. (2017) Determinants of Communal Farmers' Willingness to Pay for Human-Wildlife Conflict Management in the Periphery of Save Valley Conservancy, South Eastern Zimbabwe. *The Journal of Animal and Plant Sciences*, **27**, 1678-1688

[56] Replace: Murphree, M.W. and Metcalfe, S.C. (1997) Conservation Policy and the Campfire Programme in Zimbabwe, CASS Technical Paper Series 1/97. CASS, Harare.

[57] Scoones, I. and Matose, F. (1993) Local Woodland Management: Constraints and Opportunities for Sustainable Resource Use. In: Bradley, P.N. and Mcnamara, K., Eds., *Living with Trees*: *Policies for Forestry Management in Zimbabwe*, The World Bank, 157-198.

[58] Moyo, S. (2000) Land Reform under Structural Adjustment in Zimbabwe: Land Use Changes in the Mashonaland Provinces. Nordiska Afrikainstitutet, Uppsala.

[59] Fakarayi, T., Mashapa, C., Gandiwa, E. and Kativu, S. (2015) Pattern of Land-Use and Land Cover Changes in Driefontein Grassland Important Bird Area, Zimbabwe. *Tropical Conservation Science*, **8**, 274-283. https://doi.org/10.1177/194008291500800120

[60] du Toit, R.F. (1985) Soil Loss, Hydrological Changes, and Conservation Attitudes, in the Sabi Catchment of Zimbabwe. *Environmental Conservation*, **12**, 157-166. https://doi.org/10.1017/s0376892900015575

[61] Du Toit, R.F. (1992) Large-Scale Wildlife Conservancies in Zimbabwe: Opportunities for Commercial Conservation of Endangered Species. In: van Hoven, W., Ebedes, H. and Conroy, A., Eds., *Wildlife Ranching*: *A Celebration of Diversity. South Africa Game Organization*, Pretoria, 295-300.

[62] Zwart, G. (1990) Women's Issues in Agriculture. The World Bank Zimbabwe Agricultural Sector Mission.

[63] Dzingirai, V. and Matuture, M. (2008) A Review of Sectoral Policies Related to Community-Based Natural Resource Management in Zimbabwe. Regional CBNRM Policy working Group Meeting, Johannesburg, 15-16 July 2008, 1-7.

[64] GoZ (Government of Zimbabwe) (2013) Zimbabwe Agenda for Sustainable Socio-Economic Transformation (ZIMASSET): Towards an Empowered Society and a Growing Economy, Harare.