

Environmental Degradation in Mbeya Urban: A Case of River Sources, 1920s – 1950s

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Abstract

The degradation of river sources has been a critical problem throughout history of humankind, and initiatives to protect the river sources from damage have had many consequences and limitations, leaving many significant lessons to be learned. This paper traces the causes of degradation of environment at river sources during the British colonial rule in Tanganyika from the 1920s to the 1950s, using evidence from river sources in Mbeya Urban. The discussion analyzes the initiatives taken by British colonial officials to conserve the river sources and the limitations which hindered their efforts. Population growth in Mbeya, which led to overcrowding, unguided settlements, cultivation on steep slopes, sand quarrying, deforestation, grassfires, grazing and soil erosion was the main cause of this problem. The paper reveals that anti-erosion rules, creation of forest reserves and controlling sand quarrying and fires in the areas of river sources were the main three British colonial conservation interventions. The interventions resulted into ecological changes for human settlements and forests, created employments to some local people and aroused political awareness among local people of Mbeya. Therefore, this paper advances the historiography of environmental history in Tanganyika (present-day Tanzania). It shows an understanding of historical ecological, political, economic and social effects of colonial rule in Mbeya Urban and more broadly in Africa.

Keywords: Colonialism, Degradation of Environment, River Sources, Usafwa Chieftdom.

Introduction

This paper examines the history of environment degradation in river sources in Mbeya Urban during the British colonial period from the 1920s to the 1950s. Mbeya Urban is located in South-west part of Tanzania in Usafwa Chieftdom under the chieftainship of Lyoto. Environmental degradation is the deterioration of the environment through human activities resulting in the depletion of resources, contamination of air, water, and soil and the destruction of the ecosystems (Johnson et al, 1997: 584, Ogboru and Anga, 2015: 5). It is any change or disturbance to environment perceived to be deleterious or undesirable. Degradation of environment is among problems which reduce the quantity and quality of water in river sources. It also leads to loss of biodiversity by disrupting the ecosystem and loss of other natural resources. (Komba, 2006:52). It is either caused by natural or through human activities which lead to environmental problems such as destruction of river sources. The broader processes of degradation of environment in river sources in colonial Tanzania, including how the British colonial government attempted to alleviate the problem, have not received adequate attention from historians. This essay is conceived in order to present findings of historic inquiry into the causes of degradation of

environment in river sources from the 1920s to the 1950s, and how the British colonial government dealt with the problem, using Mbeya town of southwest Tanzania as a case study

The growth of Mbeya as urban centre went hand in hand with degradation of neighbouring river sources of Nkwanana, Nsalaga, Ivumwe, Nzovwe, Ilomba, Meta, Amaso, Ilunga, Salizi, Hanzya, Sisimba, Nonde and Mfiwizimo. Historical processes such as urban population growth, changes in agricultural practices, human settlements in river sources, grass fires, overgrazing, sand quarrying, deforestation and soil erosion combined to produce conditions for river sources degradation. These processes reduced infiltration of water in river sources, caused soil compaction, depleted vegetation cover, accelerated surface run off and reduced the amount of water to feed the river sources.

The British colonial government devised some conservation interventions to alleviate the degradation of river sources. It formulated anti-erosion conservation rules, which prescribed the use of terracing, ridges, contour bands, hedges, storm water drains, ditches or pits and planting trees (Southern Highland Provincial Book). It also involved interventions of creation of forest reserve in Mbeya Range and the local forest reserve at Sindungwa in the 1950s. Other interventions included removing local people from river sources by force, controlling fires, constructing fire-breaks, and educational campaigns (Ibid.). The colonial government initiated these interventions within the context of Indirect Rule Policy and therefore required local chiefs and their respective native authorities to oversee these conservation efforts.

The conservation interventions that the colonial government initiated to manage river sources generated many consequences. They led to changes in the social and ecological landscapes of Mbeya through population displacement and creation of forest reserves. They also expanded employment opportunities among the local residents of Mbeya. Some local people got jobs in cleaning fire-breaks, some were trained to serve as Forest Rangers and others were trained in different conservation careers (Ibid.). In addition, conservation programmes facilitated the rise of social protests against colonialism in Mbeya. Local people protested against resettlement scheme, anti-erosion rules and other conservation measures in Usafwa Chiefdom. The interventions that the colonial government initiated and implemented to conserve river sources in Mbeya were part of the broader historical processes of the “second colonial occupation” that shaped the history of colonial Africa during and after the Second World War. The interventions aimed to provide social and economic development, but they increased exploitation of local people to cover the war damage (James, 1998: 82). In many ways, the measures were part of the British colonial ‘civilization mission,’ which was embedded in ideologies of racial and cultural superiority based on the faith of western scientific achievements and mastery over nature. From the 1940s the measures were enshrined in the modernization drive in post war Africa (Low and Lonsdale, 1976: 12).

This paper states the problem that, British colonial officials noted in the 1920s and 1930s that the amount of water in rivers was decreasing due to soil erosion, cultivation on steep slopes, overgrazing, grass burning, population overcrowding, and deforestation. Despite this problem of degradation of environment in river sources there has been no historical study on the British colonial officials’ perceptions of degradation of Environment in river sources and how they attempted to deal with it in Mbeya urban. The British colonial government’s interventions in conserving river sources were shaped by a belief that local farming, herding, and other land use practices were destructive to environments of river sources. From the 1930s, the British colonial government started to manage the river sources by using legislation and technical methods. Yet, such conservation interventions were limited and had

minimal positive results in conserving river sources because they neglected local ecological knowledge of the Safwa, local people in Mbeya Urban.

This paper identifies the causes of degradation of environment of river sources in Mbeya Urban from the 1920s to the 1950s, examines the initiatives taken by the British colonial government in conserving the river sources and analyzes the consequences of the British colonial conservation measures in river sources in Mbeya Urban from the 1920s to the 1950s. In methodology, the paper uses a qualitative undertaking that follows interpretive approaches of research in describing data. It uses descriptive techniques in the data collection which included interviews, field observation and review of written documents which were researched in libraries of the University of Dar-es-Salaam and archives at Mbeya Southern Highlands Zonal Archive (MSHZA) and Tanzania National Archives (TNA).

This discussion is guided by Political Ecology theoretical framework which addresses environmental degradation by using contextual approaches. It also guides the discussion to pay attention to ideas and actions of societies on environment and the theory also shows how political actors influence ecology. Roderick P. Neumann (2005) considers the theory as a suitable multidisciplinary approach for studying resource management and Degradation of Environment. The theory originated in the 1970s when environmental history was also emerging. It helped in examining the ways in which ecological ideas influenced resource use and management practices during the British colonial rule (Lawi, 1999: viii). Thus political ecology argues for consideration of Degradation of Environment within its historical, political, economic and ecological contexts (Blaikie and Brookfield, 1978: 17). It exposes indirect rule in the conservation as a non-participatory, top-down and control administrative method, which excluded local people and disempowered them in the exercise of conserving their river sources during the colonial period.

The Extent of Environmental Degradation in River Sources in Mbeya

British colonial officials related degradation of environment in the river sources to population growth, poor cultivation methods, animal grazing, grassfires, deforestation and soil erosion. With regard to population concentration near river sources, Patrick B. Maxwell, the Forest Officer in the 1930s, reported that there were about 80 people cultivating in the river sources of Amaso River. Likewise, 50 families in the Hanguru area were cultivating on precipitous slopes and steep sided hills on the South side of Shongo River; 111 families were in the Debwe area; Ngogwe area had 28 families, Shogwa had 61 families and 44 families were scattered all along the South of Mbeya Range. In addition, Maxwell found out that about 321 people were living in the Mbeya Range (MSHZA, Archives). He also noted that "Owing to unrestricted cultivation both on steep mountain slopes and in valley bottoms, and to disastrous grass fires every year, the flow of water in rivers in the dry seasons grew steadily less and for many years grave had been felt on this score." (Ibid.). This colonial official, therefore, perceived the problem of Degradation of Environment in river sources to have been serious and that it was aggravated by a tendency of indigenous communities to live and cultivate land located close to the river sources. Monthly Reports of the Departments of Agriculture and Natural Resources showed incidences of fires in some river sources. The fire hazards further increased skepticisms among colonial officials with regard to environmental safety and perceived them to aggravate destruction of river sources in Mbeya. Degradation of environment became prominent in daily activities of the British colonial government and soil erosion or rather, fear from it, was the common thread that bounded together agricultural policies.

From being a problem identified and handled at a local level in each colony in 1928, soil erosion had by 1938, come to assume a significant position in general imperial policy making.

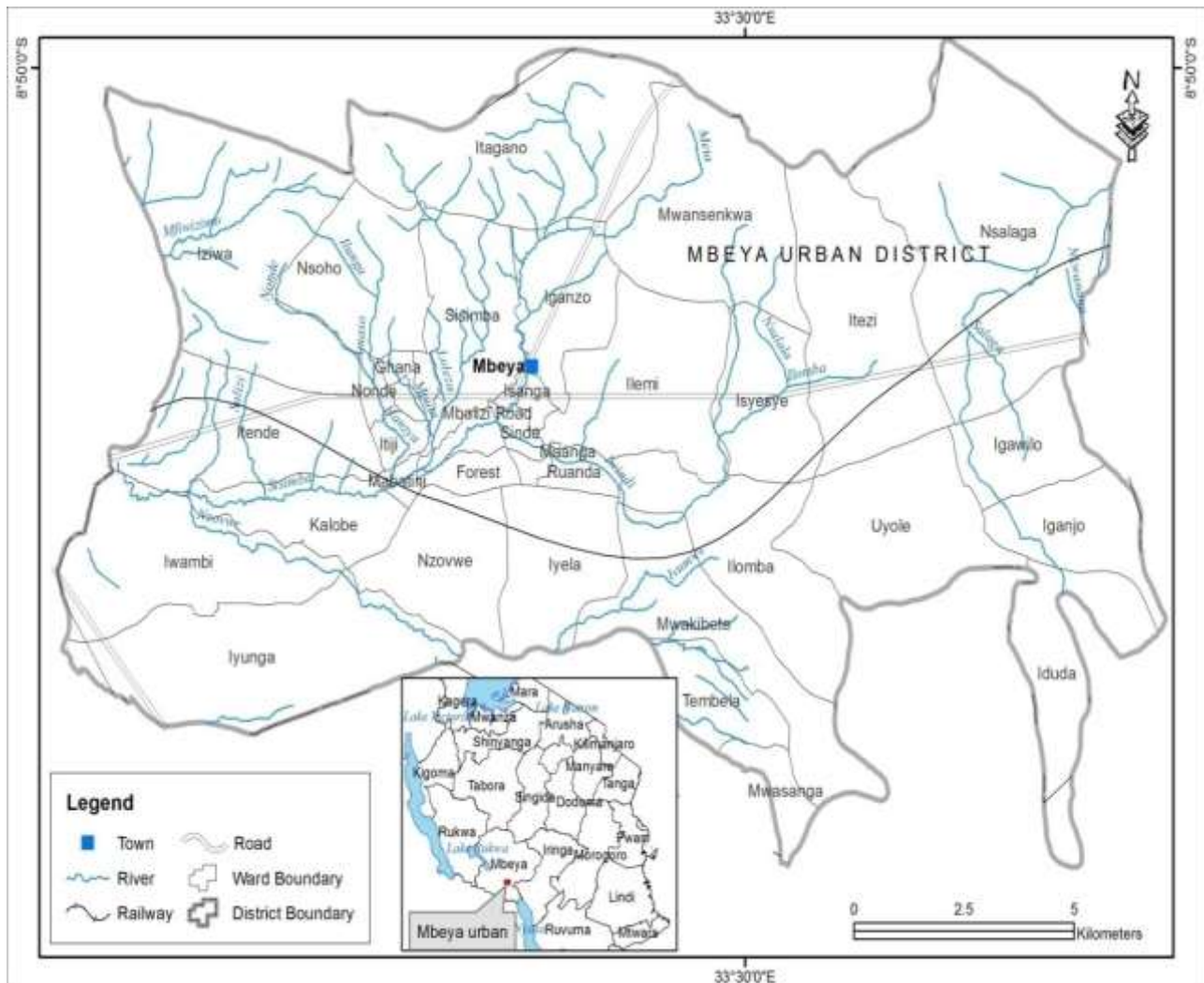
The British colonial authorities in Mbeya Urban Centre grappled with the problem of Degradation of environment in river sources and treated it as a technical problem that required technical solutions. Studies that were conducted on this field also focused on technical aspects. For example, in 1956, the East African Agriculture and Forestry Research Organization (EAAFRO) under Dr. H.C. Pereira began studies on water balance in some river sources under different land use patterns in Mbeya (.MSHZA, Archives). From 1957 to 1959, quantitative data on run-off and soil loss were collected in some river sources in order to measure the extent of the problem. In Sisimba, discharge of flow changed from 0.056 cubic metres per second (m^3/s) to $0.0099 \text{ m}^3/\text{s}$; in Ivumwe discharge declined from $0.35 \text{ m}^3/\text{s}$ to $0.237 \text{ m}^3/\text{s}$; Nzovwe had a low flow measurement of $0.280 \text{ m}^3/\text{s}$ which declined to $0.25 \text{ m}^3/\text{s}$; and Mfiwizimo had $0.062 \text{ m}^3/\text{s}$ which dropped to $0.0115 \text{ m}^3/\text{s}$ (Ibid.). Water quantity declined in river sources due to degradation of environment, which was accelerated by cultivation on river sources, deforestation, overgrazing and bush burning (Ibid.). The remaining sections explore these causes in details.

Causes of Environmental Degradation in River Sources, 1920s-1950s

Population Growth and Agricultural Practices

Population growth in Mbeya town influenced the use of natural resources, which sometimes, due to geological and ecological situations, ended into degradation of environment in river sources. Colonial officials saw a link between population growth and environmental deterioration as early as the 1920s, but demographic expansion became a highly pressing issue in the 1950s when population began to grow at an even faster rate than expected (Giblin and Maddox, 1996: 10). Population growth led to overcrowding, uncontrolled cultivation on steep slopes and river sources, overgrazing, grass burning and deforestation and such developments accelerated anthropogenic soil erosion, which ended on degradation of environment in river sources. Attention should be paid to distinguishing between natural conditions and human actions which caused different kinds of degradation of environment. It is worth noting that factors had different roles, some directly caused degradation of environment, and others merely enabled the action of the former. Thus in relating population and degradation of environment in the river sources, this paper pays attention to ecological variations and human influences on the river sources. It concentrates on tracing degradation of environment in river sources of rivers shown in the map below, which included, Nsalaga, Nkwanana, Ilomba, Ivumwe, Nzovwe, Meta, Amaso, Sisimba, Hanzya, Ilunga, Nonde, Salizi and Mfiwizimo.

Degradation of environment started to take place at an alarming rate in some river sources in Mbeya from the 1930s due to population growth. In 1931, the urban centre had a population of 84,600 with population density of 1.8 percent, which, in 1934 the population increased to 106,400 (.Gilmann, 1936: 371). In 1948 census the population rose to 184046 as shown in the table below. R.B. Brayne, the District Commissioner of Mbeya reported that many People settled on Mount Mbeya, which had many river sources. Concentration of population on Mount Mbeya led to the growth of villages like Itege-Iziwa, Nshinshi, Shogwa, Nkunguru, Debwe, Wayanga, Shongo, Ngogwe and Hanahambeya(TNA Mbeya District Book 1.). Brayne showed that other settlements emerged at Ivumwe, Ilomba, Isyesye, Nsalaga, Igawilo, Isanga, Mabatini, Mwasenkwa, Sokomatola, Uhindini and Uzunguni. In the 1930s he also evaluated the problem of degradation of environment in river sources in Mount Mbeya in relation to population settlements and other human activities.



Map Showing Major Rivers in Mbeya City

Source: Geographic Information Systems (GIS), Institute of Resource Assessment (IRA), University of Dar es Salaam

East African Population Census, Mbeya Township, 23rd August, 1948

TRIBE	MALE	FEMALE	TOTAL	PERCENTAGE%
Safwa	19280	21471	40751	21
Nyiha	17902	21223	39125	21
Nyakyusa	10045	10170	20215	11
Nyamwanga	7785	10513	18298	10
Malila	8139	9287	17420	10
Sangu	6794	8187	14981	8
All Others	16112	17138	33250	18
86057	92989	184046	100	

Source: TNA, Mbeya District Book 1.

Patrick Maxwell the District Forest Officer in 1938, reported intensive cultivation on steep slopes at Itege-Iziwa, Shogwa, Zongo, Kaluwe, Debwe, Waranga and Halungu. Cultivation on steep slopes exposed land to soil erosion and undermined flow of water (Ibid.). He also found out that in order to support the growing population and food markets, long-term fallows were gradually being abandoned and replaced with intensive land use system of continuous land cultivation. Such demands and pressures made farmers to be more focused on land cultivation than on rehabilitating it with good land management practices and this brought about adverse effects on river source area environments. In many ways, shorter fallow periods, lack of alternative farming practices and poor input supply contributed to degradation of environment in river sources. Maxwell was particularly concerned that cultivation on steep slopes and use of chemicals started to pollute river sources at Ivumwe, Meta, Ilomba, Hanzya and Nonde (Ibid.)

Overgrazing, Bushfires and Sand Quarrying

river sources have been ecologically sensitive areas with fragile environments and remained attractive to livestock because of the presence of water for animals to drink. While in other places pastures decreased during the dry seasons river sources retained some vegetation and water for livestock throughout the year. In connection with animal grazing, Wilson Yohana Mpayo, a Retired Agricultural Officer, described the Safwa as agro-pastoralists who depended on agriculture for subsistence and kept herds of livestock for social status, capital and security purposes.

Oral sources revealed that until the 1920s a large part of Mbeya was covered by reeds, elephant grass, trees and there were a lot of wild pigs, but by the 1930s a large part of Mbeya started to be used for free range grazing. Movement and grazing due to increased livestock led to destruction of vegetation cover along some river sources. Informants recalled that with increased grazing pressure, soil erosion became wide spread at Mfiwizimo, Nonde, Salizi, Ilunga, Amaso and other river sources of Ilomba and Ivumwe, Nzovwe. Patrick Maxwell highlighted that in the 1940s, as Mbeya experienced demographic expansion, cultivation and increase in livestock keeping while grazing areas became scarce. Thus animal grazing started to concentrate on a few areas. Some animals were grazed along steep slopes where even cultivation was difficult. That pattern also led to soil compaction and increased surface run-off that affected water infiltration in river sources.

Fire was also among the causes of degradation of environment along river sources as it led to deforestation and accelerated soil erosion, which ended in siltation at river sources. Historically, fire was part of the ecological history of the Usafwa Chieftom under the chieftainship of Lyoto (*Lyoto* means “big fire” in Safwa language). Many fires, which occurred in the 1920s in Mbeya, were caused by shifting cultivation (which entailed slashing and burning practices), collection of honey, hunting, security against wild animals and dangerous insects, as well as accidental burning (MSHZA). Some fires like that of 1928 on Mount Mbeya at Mfiwizimo, Salizi and Ilunga river sources were accidentally caused by farmers who were clearing their farms. Such fires destroyed all three river sources and left them bare as well as susceptible to soil erosion (Ibid.). Mr. R.B. Brayne (the Mbeya District Officer) and Patrick Maxwell (the Forestry Officer) related occurrence of fires in many river sources in Mbeya with peasants’ hunting activities, cultivation, animal grazing, and struggles for getting fresh pastures.

In the 1940s, there were continuous fire hazards along Mount Mbeya, Ivumwe, Ilomba, Meta and Nkwanana, but at Nzovwe, Nsalaga and Sisimba river sources the problem was not common due to ecological situation of the areas. Sisimba was already protected by the Department of Water Supply after

installing a water intake in 1930, while Nsalaga was under close observation of an individual person, the bishop of Assemblies of God Church, Reverend Yohana Mpayo. Ivumwe had a tree nursery for planting on the Community Forest at Kawetire and thus, it was also protected from burning (Ibid.). There was a relationship between rapid urban population growth and frequent occurrences of grass burning along river sources. The Forest Rangers used to have special forms for recording fire incidences, which showed causes, effects and measures taken on fires. For example, their records show that on 13th November, 1952, fire occurred at Mount Mbeya and destroyed larger areas because people refused to participate in stopping it due to harassment they were getting during the creation of the reserve (Ibid.). Communities that surrounded the Mbeya Range Forest Reserve started to refuse to go to stop fires on account of that the reserve was a source of many troubles in their areas. They remarked that, the Forest Rangers were very harsh whenever any body was caught collecting firewood or grazing in the reserve. Sand quarrying contributed to create conditions for degradation of river sources in Mbeya. From the 1930s to 1950s there was degradation of environment caused by collection of sand at the Nzovwe river source area for building purposes. According to Mr. R.P. Read, who was the District Commissioner for Mbeya in the early 1950s, quarrying that was done in the stream bed and within the river source area, caused deforestation, considerable water pollution and destruction of the river source area (TNA, Mbeya District Book 1.). Sand quarrying accelerated soil erosion as well as landslides and also destroyed the process of water infiltration in the river source area

Deforestation and Soil Erosion

Deforestation was another anthropogenic cause of degradation of environment in river sources because it led to the loss of vegetation cover, destruction of organic matter, and reduction of soil moisture. Deforestation caused soil erosion, which ended in sedimentation in river sources because it left the land bare and retarded water infiltration in the earth sub-surface. It also led to a decrease in local rainfall and disruption of hydrological cycle as well as the downstream flow (Fairhead and Leach, 2000: 42). The major cause of deforestation was population growth that forced people to over exploit forests. Archival sources revealed that the early 1930s were characterized by establishment of many buildings in Mbeya urban centre which led to logging and cutting poles for construction even close to some river sources (TNA, Mbeya District Book 1).

In the 1940s deforestation increased due to an increase in crop production. Mr. C.W.E. Fishlock, the Agricultural Officer for Mbeya in the 1940s noted the problem of deforestation in the Agricultural Note Book that the increasing density of human and livestock population was causing a severe strain on the supplies of water (MSHZA). Mr. Fishlock also remarked that, in spite of rules and propaganda for preservation, streams and stream banks were being damaged through deforestation and generally, they became subjected to silting through erosion of land around their sources and courses (Ibid.) Land use history in Mbeya urban from the 1920s to 1950s lacked strict guidance of preserving river sources to the extent of making some of them to have remained unsuitable for the water supply.

The British Colonial Forest Officers did not do adequate researches concerning the most appropriate tree species to be planted in the river sources for some trees grown like the Eucalyptus species, had adverse drying effects on land (Ibid.). Such Eucalyptus trees are heavy water users adapting to ecological conditions of areas. Not only did the eucalyptus trees suck and dry huge volumes of water out of the soil but also the toxic substance in eucalyptus leaves and roots affected other local trees such that they caused ecological deforestation.

Soil erosion also played an important role in degrading river sources. The British colonial officials perceived the river sources to be susceptible and vulnerable to soil erosion which eventually led to the decline in water quantity and quality. Officials were concerned because soil erosion affected river sources through deposition of silts and by accelerating surface run-offs, which hindered infiltration in the soil to feed river sources (TNA, Mbeya District Book 1). The other effect of soil erosion was disappearance of top layers of valuable productive soils and lowering of water table in the soils together with drying-up of springs and lowering water in streams as well as rivers (erosion, creating furrows of more than one metre deep (Stebbing, 1945, 290-291). On hill slopes of some steepness, landslide erosion has been occurring as a sudden movement of soil and weathered rock, creating slide scars. Some landslide masses that have beginning with a sliding movement change into viscous flows as they moved down the slope (Ibid.).

In the 1950s, soil erosion was noted in Mbeya although many measures also were being taken to control it. In the early 1950s, S.M. Clarke, the then District Agricultural Officer, J. G. Cowap, District Officer, H.W. Hamlin, the Provincial Forest Officer, H.M. Maughan-Brown, Conservator of Forests and L.A. Wince, Chief Hydrologist in Water Department in their meeting at Mbeya on the issue of soil erosion concluded that peasants in Mbeya were destroying their land due to inadequate fallowing practice, excessive burning and by exposing cultivated soil on steep slopes to sheet erosion (MSHZA). Such observations reflected the result of population expansion, urbanization and other changes in political economy, which forced people to change their agricultural practices that ended in degradation of marginal land and some river sources. In 1955, the Committee for Catchment Area Research also noted that intensive cultivation on very steep slopes and grazing caused serious soil erosion, which affected river sources by sedimentation (Ibid.).

British Colonial Interventions to Conserve River Sources and their Limitations

Soil Conservation Programmes

For conservation of river sources, the British colonial government's undertaking on soil erosion focused on the highlands (Conte, 1999: 228). The highlands in the then Tanganyika (now mainland Tanzania) had high population, which depended on cultivation that accelerated deforestation, soil erosion and led to diminishing water supply down slopes as they degraded river sources like those in Mbeya Range, Meta, Nsalaga and Nkwanana in Mbeya. The soil conservation measures taken by the British colonial state in river sources in Mbeya town were marked by incorporation of sectors of agriculture, forestry and other natural resources at large. Mr. S.M. Clarke and C. Fishlock, the District Agricultural Officers in the mid 1930s, showed that soil conservation measures in Mbeya Southern Highland Province were still at their infancy due to lack of European staff and trained African instructors. They also noted that there was minimal use of terracing prior to planting and planting on contour ridges (TNA, Mbeya District Book 1.). In addition, they commented that very few African peasants had adopted soil conservation measures as elementary conservation works in their farms.

During the 1930s, limited soil conservation measures were put into practice both by local actions and use of Ordinances. For instance, in 1937 local authorities passed a rule that enforced soil erosion control measures. This Anti-erosion Rule of 1937 stated that "any person opening new shambas on sloping land shall whenever the Native Authority considers it necessary take such measures to prevent erosion as the Native Authority with the advice of District Agricultural Officer may prescribe." (Ibid.) The rule prescribed use of technical methods of terraces, ridges, contour bands, hedges, storm water drains,

ditches or pits and tree planting to stop wind erosion. The rule also prescribed fines not exceeding 40 shillings or imprisonment of two months to any person who failed to follow it (Ibid.). Although the colonial government tried to demonstrate ways of soil conservation but little interest was shown by the peasants. The assessment of the conservation efforts from 1937 to 1945 by Clark and Fishlock showed a fair achievement made in enforcing erosion control measures, but complained about the lack of enough fund during the war years, which made continuity of the efforts difficult.

Some soil conservation measures failed because they gave no improvement in crop yields, land fertility and soil stability. Many measures were unpopular to local people because they interfered with many and complicated agricultural practices. Wide grass strips and contour hedges were rejected because they used too much land and contour banks were unpopular because they led to infestation by rats. In addition, people cleared their land because of problems of tick borne diseases (MSHZA).

Creation of Forest Reserves and Afforestation

Sebastian Casmir Ngowi, the District Forest Officer said that conservation of river sources was also done through management of forests by creating reserves. The British colonial government also used the Forest Ordinance Number 32 of 1921 to reinstate the forest reserves delimited by the Germans and placed restrictions on access as well as use of forest products (MSHZA). The Forest Ordinance of 1921 was amended and replaced by the Forest Ordinance of 1933, in which the British colonial government emphasized protection of forests for the preservation of water catchment, preventing fires, and controlling grazing (Lovett., 2002:134). Restrictions in the 1933 Forest Ordinance were retained in the 1957 Ordinance and objectives of forest policy during the remaining period of the British administration were for the protection of forests in river sources and timber production in plantations (Ibid.). Colonial interests in timber production contradicted with the exercise of conserving river sources because tree cutting exposed the river sources and led to Degradation of Environment.

The establishment of Native Authority Forest Reserves was another measure adapted by the colonial government to assist in conserving river sources. The colonial government through the use of its indirect rule promoted establishment of Native Authority Forest Reserves and plantations like that at Sidungwa and Kawetire, respectively. With advice from the Forest Department, the government assisted native authorities in Mbeya to establish their own forest reserves and plantations from the 1930s. Soil and river sources protection became explicitly integrated with colonial forestry policy in the 1930s (MSHZA). The Native Authority Forest Reserves were seen by the colonial government as compatible with indirect rule and created hope that they would introduce the Safwa to the principles of scientific forestry without conceding any control over the forest zone.

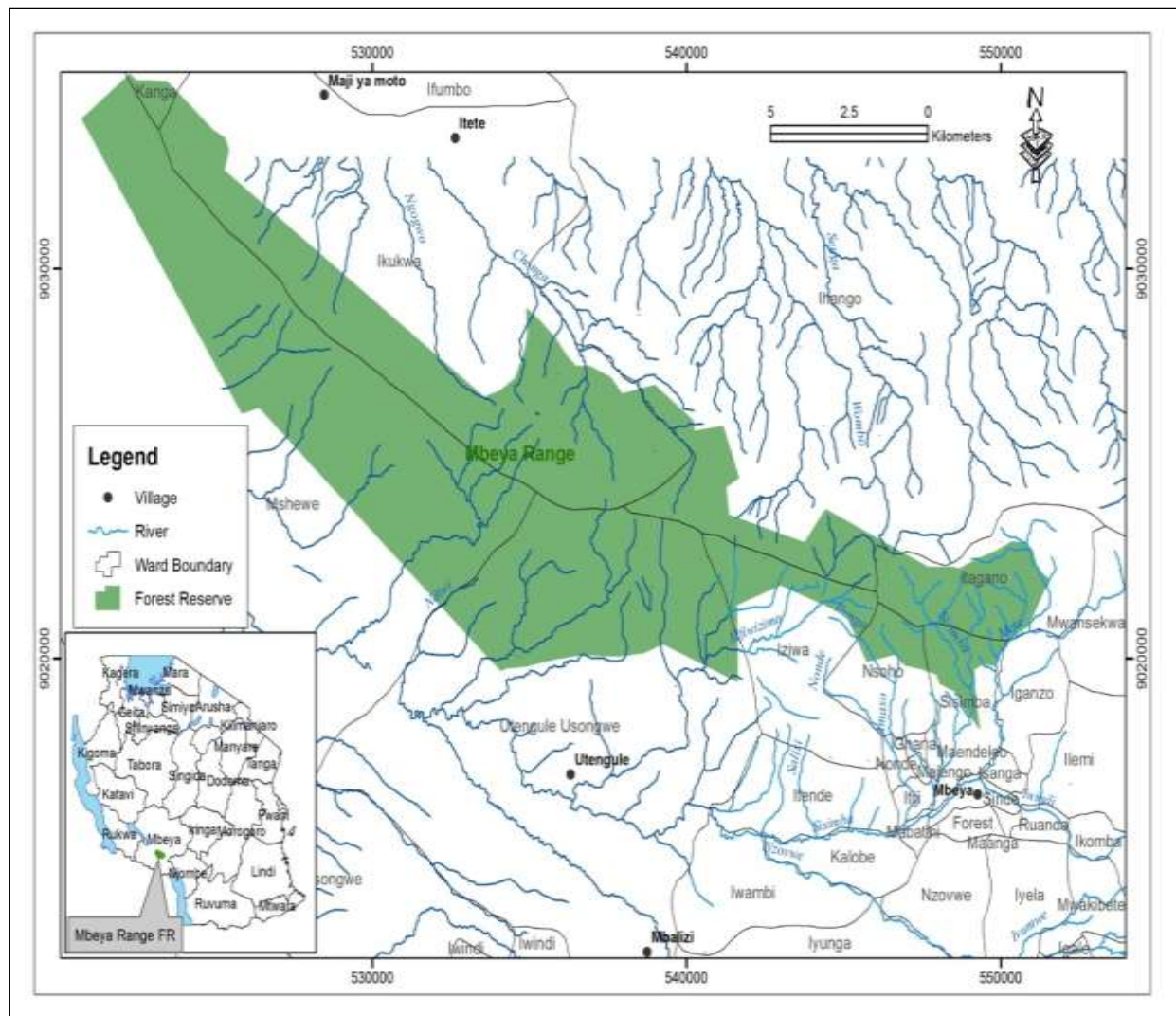
In the 1930s the British colonial government created forest plantations and reserves and it provided tree seedlings to local people for land afforestation of river sources without doing adequate research concerning appropriate tree species (Ibid.). For example, in 1937, the Kawetire Forest Plantation was established at Ipinda on the North and North-eastern part of Mbeya Township. Similarly, the segment of rain forest called Sidungwa was also gazetted as a Native Authority Forest Reserve by Government Notice Number 140 of 1937, with Proclamation Number 14 of 1937 (Ibid.). Afforestation campaigns simultaneously served to conserve river sources, soils and forests. The Forest Rangers set up a Native Authority nursery of tree seedlings for reforestation in Mbeya Range Forest Reserve. The British colonial government struggled to create the Mbeya Range Forest Reserve from the 1930s to 1950s. The Range lies to the North West of Mbeya town and at the time it was demarcated, it had an area of 38,520

acres. The Eastern section of Mbeya Range lies in what was the Usafwa Chiefdom under Chief Lyoto, the Western section in the Usongwe Chiefdom of Chief Mwalyego and the Northern in the Chiefdom of Chief Zumba of Chunya. The Range formed the catchment area for river sources of streams and rivers including Ilunga, Salizi, Mfiwizimo, Sisimba, Nonde and Amaso.

The colonial officials, including Mr. Patrick Maxwell, the Forest Officer, R.P. Read, the District Commissioner, and others realized the problem of degradation of environment in Mbeya Range Forest caused by cultivation, grazing on steep slopes and fire burning, which accelerated soil erosion. In their use of indirect rule, from March, 1938, they incorporated the chiefs with their local native authorities in the struggle for creation of Mbeya Range Forest Reserve (MSHZA). According to Mr. R.P. Read, who was the District Commissioner for Mbeya in the early 1950s, the scheme of establishment of Mbeya Forest Reserve was marred by of political unrest and the whole affair was remarkable for the resistance it faced. One instance of that resistance was portrayed during the meeting at Mbalizi on 6th July 1956 by a local councillor called Kalilile, who was outspoken in the condemnation of the scheme to the extent of trying to stage a war against the colonial government. He was calmed down and eventually signed the agreement with the Native Authority to vacate the land and serve as a witness to Chief Njeye Lyoto's signature (MSHZA). A map below gives an idea of numerous water flows in Mbeya Range Forest Reserve, which called for urgent protection. Maxwell argued that "it is only on actually seeing the situation that one realizes the urgency of reservation." It was a right time to enforce rigid soil conservation measures on the Range because rivers flowing from it were drying up to an extent that in the dry seasons they caused great distress among people living on the plains (Ibid.)

Finally, on 14th July, 1956, an agreement was signed between the chiefs of Usafwa Chiefdom and the colonial government under the District Commissioner, Mr. Read at Mbeya Township to relocate local people from Mbeya Range. The total compensation paid was £ 5,179 to 321 people, but the total cost of the whole operation rose to £ 6,106 (Ibid.). The colonial official team made constant trips through the Range to see that no unauthorized cultivation took place and that no new houses were built. In addition, Mr. L. Abrahamson, the Crop Supervisor, was stationed in the Range during planting season. Two Agricultural Instructors and four Native Authority Messengers were also permanently stationed on the Range from August, 1955 to June, 1956.

The relocation of local people in Mbeya Township took place in the 1950s when 321 people were evicted from Mbeya Range where there were river sources of Salizi, Sisimba, Mfiwizimo, Nonde and Ilunga. Local people were displaced from Debwe, Shongo, Ngogwe, Shogwa and other small areas in Mbeya Range (Ibid.). The displacement changed ecological landscapes, which formerly used for settlements,



Map of Mbeya Range Forest Reserve with Dense Networks of Streams

Source: Geographic Information Systems (GIS), Institute of Resource Assessment (IRA), University of Dar es Salaam.

cultivation and grazing, and people were appeased to stop uncontrolled burning of grass as well as bushes. The boundary was set up for the protection and reservation of the created landscape. Creation of the Mbeya Range Forest Reserve fitted in an approach encouraged by Holmes Rolston, who advocated starving people for protection of natural resources. In resettling the local people who had initially occupied the Range, the British colonial officials, in fact, practised the approach termed by Rolston as “fortress,” “fences” and “fines” or coercive conservation measures (Siurua, 2006: 74).

Research projects were also involved in conserving river sources in Mbeya. For instance, in July, 1956, the East African Agriculture and Forestry Research Organization (EAAFRO) started a research project for investigating the ecological situation of water catchments in Mbeya Range (MSHZA). The research project examined different land uses, investigated soil erosion, and traced hydrological regime of the area. The paper also surveyed the characteristics of local communities, which surrounded Mbeya Range Forest for devising appropriate conservation measures for water, forest and soil.

The research project under Dr. Pereira realized that large scale expansion of forests which were established in the past had the following disadvantages: when cultivation was removed from the reserve,

it caused further pressure on remaining land for cultivation and thus caused reduction of fallow periods thereby accelerated depletion of soil as well as water (Ibid.). When the displaced local people were settled at the bottom of the Range, they started to expand cultivation on virgin land that included some of river sources. This resulted in antagonizing the local people against the colonial government. Expansion of forests on a large scale disrupted local subsistence economy of the area. The research project recommended conservation of river sources by using grasses in suitable proportions for easy infiltration of water in the soil. This would make Mbeya Range not to be totally covered by trees but some of its areas would remain covered by grasses.

Controlling Fires and Quarrying in River Sources

In the interview Peter Kayamba narrated that among local people of Mbeya, burning was not haphazard. People had various traditions or taboos in control and use of fires. Every person had the right of setting fire under correct weather conditions, in the correct seasons and when the vegetation had specific characteristics. The traditions reduced the risk of negative effects and maximized positive effects of burning. Fire was recognized as a key tool for many years in maintaining their landscapes for productive use. Fire was seen as an integral part of the Safwa ecological system, for since their early scattered settlements, they controlled fire and used it for their advantages. Fires served to renew pasture for cattle grazing by removing unpalatable lignified grasses and encouraged sprouting. Pasture fires did not necessarily increase soil erosion to affect the river sources. Kayamba emphasized that periodic burning was a well established practice throughout the history in Usafwa Chieftdom in Mbeya town. There was realization of consequences of not burning in forests, which would be dramatic as the built up fuel could engender destructive wildfires.

With urbanization and after the British colonization of Mbeya Southern Highlands Province, many issues regarding the use of fires on the landscapes changed. It seemed that the British colonialists' ignorance of the natural history of fire in relation to the ecological areas of river sources stemmed partly from their scepticism to fire for destroying vast areas of pristine forests and affecting some river sources. Control of fires was emphasized by the colonial government in Mbeya in order to preserve river sources and forests. Ideas of colonial administrators on fires had their roots in the science of forestry and they believed that fires were nothing more than a "human artefact" and considered them alien, destructive factor to ecosystem of river sources and forests (TNA Archives). The British colonial perceptions of traditional knowledge on the use of fire were coloured by incendiarism and as a reaction of the local communities to the colonial anti-fire legislation (Ibid.). In the Usafwa Chieftdom, control of grass burning in the 1930s for the protection of river sources by judicial approach was done through the use of the local legislation under Section 8 (a) whereby the native authorities prohibited, restricted and regulated burning of grasses or bushes. The government Notice Number 5 of 1933 also gave power to all native authorities to enact by-laws for the control of fires. The order stated that the "... authority granted all native authorities to issue orders under section 8 of the Native Authority Ordinance for the purpose of extinguishing and preventing the occurrence of fires in the forests." (Ibid.). The native authorities in Mbeya Township in 1938 passed an order under Section (g) and (n) to prohibit destruction of bush or vegetation along the banks of streams and their river sources (TNA, Mbeya District Book 1.). In the local forest reserves, later on in conserving river sources, the Forest Ordinance of 1958 (Cap. 389) was also used in controlling burning (Ibid.). In the 1950s after the establishment of Mbeya Range Forest Reserve fire control was done by constructing fire breaks around the reserves and river sources

(MSHZA). Fire control was also done through early burning and in the Mbeya Range. This was done by Resident Forest Rangers. Thus, combustible materials were removed annually with minimum damage. Sometimes, labour for fire control and path clearing and maintenance was recruited locally as it was required by the rangers.

Apart from controlling fires, great efforts were made to stop sand quarrying at river sources. Registered claims for quarrying were nullified by Mr. R.P. Read, the District Commissioner on 12th May, 1953. Although sand quarrying was banned, local communities went on taking sand from some the river sources (Ibid.). The source was reliable for domestic water supply for the nearby local communities and at the same time sand was needed for constructions in the growing Mbeya urban centre.

Effects of the British Colonial Conservation of River Sources

Changes in Socio-Ecological Landscapes

The British colonial conservation interventions had impacts on ecological landscapes in Mbeya from the 1930s to 1950s, which also had several effects on local communities. Before colonial conservation measures, river sources were part and parcel of ecological landscapes of Safwa in Mbeya. The conservation initiatives from the early 1930s started to change the ways Safwa related to their river sources and other surroundings. In the past, the Safwa had their natural environment of river sources as inextricable from their social world. But the British colonialists contributed to separate nature and culture of Safwa for conservation of river sources. From that time, the ecological history of Usafwa Chieftdom was changed to fit in demand for colonial conservation schemes.

Another consequence of conservation interventions of river sources was the imposition of land use categorization. The British colonial authority categorized landscapes into forestry, agricultural and the conserved river source area land uses. The conservation measures in river sources caused changes in ecological landscapes within and around the river sources, for through afforestation and reservation campaigns, some of them became covered with forests and bushes. The British colonial government imposed restrictions in cultivation and grazing in river sources. The history of conservation of river sources in Mbeya was accompanied with changes in land use around the river sources. Local people lost their important rights to agricultural landscapes.

The British colonial conservation of river sources through establishment of forest reserves changed human settlements into forest landscapes and caused miserable effects on local communities. From the 1930s, to the 1950s, forceful resettlement became compulsory when people were not ready to move out from areas intended to be conserved. The resettlement affected the local people, for many of the dislocated communities lost their homes and villages at Debwe, Shogwa, Hanguru, Wayanga, Ngogwe and Shongo River Valley, which were disrupted and were turned into wilderness (TNA, Mbeya District Book 1.). Local people lost even their ritual and traditional religious burial sites as the deceased used to be buried near their homesteads and the burial places were traditional shrines among the Safwa local communities.

The British colonial conservation interventions also changed local boundaries to fit the conservation schemes. For example, formerly, Chunya was part of Mbeya Southern Highlands District including the Lupa Mine Controlled Sub-district, but on January, 1st 1942 by Proclamation Notice Number 16 of 1941, Chunya was split from Mbeya to form an independent district (MSHZA). The process of changing the boundary was accompanied with changes in the local ecological landscape and had impacts on political

ecology as well as social landscape. The boundary between Chunya District and Mbeya Urban was also adjusted in 1955 in the process of searching an area for resettlement at Itete (Ibid).

Creation of Employment Opportunities

What became direct benefits from the conservation scheme of river sources were related to the creation of employment opportunities. For instance, in the 1940s, some local people were trained and employed in the conservation gang in which one of them was the instructor in conservation, named, David Sichizya (MSHZA). Others were employed as porters during the construction of a road to Mbeya Range Forest Reserve. From the 1950s when the river sources were under the conservation scheme, some local people got employment in constructing fire breaks and some of them were employed as Forest Guards on permanent basis.

In 1956 when the Mbeya Range Catchment Stud was established, some local people also got employment at the time of construction of buildings for the research station. Some were trained as Forest Rangers while others were employed as recorders of amount of water at some river sources. Some Forest Rangers were trained for three years at Tengeru and others were sent to Maguga for short courses in meteorological recording, soil-moisture-gauge reading and care of autographic instruments (Ibid.). The British colonial conservation of river sources in Mbeya town was also accompanied with other varieties of employment opportunities, which included recruitment of Agricultural Instructors and the Native Authority messengers to see that no unauthorized cultivation and building of houses took place in the reserved river sources (MSHZA). Some local people got employment in making bricks for building Forest Rangers' houses and stations for the Mbeya Range Catchment Paper at Shongo (Ibid.). The Forest Department trained the Forest Rangers to be residents in the Mbeya Range.

Conservation of river sources in Mbeya provided a ground for scientific researches and helped the British colonial government in building scientific capacity. For instance, the East African Agricultural and Forestry Research Organization (E.A.A.R.O) established the Mbeya Range Catchment Study to investigate soil, hydrology and ecology of the area. Colonial interventions in conserving river sources through the establishment of reserves made Mbeya to have recreational centres, which eventually affected tourism. Emergence of global mass tourism industry added a new source of revenue for individual tour guides, luggage carriers, escort boys and the colonial state, and this development provided further motivation for the government to support conservation measures. Roderick P. Neumann (2002:40) has established that the scientific nature management and mass tourism became the twin pillars on which colonial conservation policies were constructed.

Political Activism

Thaddeus Sunseri (2007:906) maintains that Native Authority forest reserves were an administrative counterpart to indirect rule, which meant to bolster local government-appointed chiefs, who in theory had historical no legitimacy, but later on attained political power. The processes of conserving river sources from the 1930s to 1950s through indirect rule made local native authorities and their chiefs become close allies to the British colonial government. Chiefs were empowered in their areas of jurisdiction in many ways: they were heads of native authorities; they were given power to enact by-laws for conserving natural resources. Any local authority, which worked contrary to the interests of the colonial government, was destroyed and its power was shifted to another chief. It is for this the reason that in 1931 Chief Mwanshinga of Igawilo Sub-chiefdom was deposed after he misused funds for

administration and his position was taken by Malangalila as the acting chief and the local court of Igawilo under Mwanshinga was shifted to Izumbwe near Mbalizi (TNA, Mbeya District Book 1.). Day-to-day resistances staged in various manners by local people towards the British colonial conservation efforts manifested local nationalism against colonialism. The resistances can be called as “nationalism in the river sources (Sunseri Op.Cit. p. 907). From the 1930s, the grievances, which were part of local nationalism, were related to anti-erosion campaigns. At the end of the 1950s the colonial conservation interventions, which were applied in the river sources, were used by politicians to arouse political consciousness among the people of Mbeya town. TANU gained great political recognition by people of Mbeya town when its local leaders connected their campaigns with problems of colonial conservation measures. Wilson John Mpayo remarked that the period of national independence movement remained as a period of politicization and strengthening public awareness to struggle against colonialism.

New Colonialism

The British colonial efforts and struggles in the conservation of river sources were embedded in the mission of what they perceived as “civilization” of Africans. However Kapepwa Tambila (2000:1) notes that explanation on the “civilization mission” was taunted, including the notion of “white man’s burden,” together with the humanitarian aspect of imperialism, which dominated Africans in different forms that included the conservation measures. It was with that notion that British colonial conservation measures in Mbeya were part and parcel of the Eurocentric ideologies of racism, cultural superiority and Western achievements over mastery of nature (Neumann, 2001: 641). With that notion the British colonial officials regarded the local people in Mbeya as “primitive” and “uncivilized” people who knew nothing about the conservation of the river sources. Local people were called as politically backward as well as primitive in their agricultural practices and ideas. With their superior tendency, the British colonialists neglected the local ecological knowledge as already explained in terms of conservation of river sources.

Historians referred to the British postwar colonial development plans and policies as the “second colonial occupation” (Iliffe, 1979:436). The conservation of river sources and control of soil erosion were part of this “second colonial occupation”. However, John Iliffe’s evaluation of the effects of the second colonial occupation is that in the long-term, it accelerated the crisis, widened social disparities and reinforced structural contradictions of colonial societies rather than bringing structural change and it intensified the process of uneven and combined development to the local people. It is not only found that the British colonial conservation efforts were supposed to incorporate local people’s ecological knowledge but also were supposed to observe the essence of power relationship as emphasized by political ecology theoretical framework used in this discussion.

Conclusion

The fate of river sources in an era of increase in the demand of fresh water has been a hot issue for a long period. Thus this paper used the problem of degradation of environment in river sources to understand the consequences of colonialism in African societies. It revealed colonial violence imposed on local people through conservation interventions in river sources. It has been realized that the problem from the 1930s became a product of British colonial anxiety which was shaped by their ecological and cultural backgrounds. Through their indirect rule the British colonialists in Usafwa Chieftdom defined

the problem of degradation of environment in river sources, suggested the solutions and supervised their implementation by the combination of use of coercion, persuasions and legislations.

The limitations which were encountered in the conservation efforts were attributed to inadequate involvement of local people, insensitivity to local needs, reliance on technical options and ignorance of local people's ecological knowledge. However, the efforts were supposed to accompany demonstrating to local people advantages of conserving river sources rather than depending sole on rules and regulations. Moreover, degradation of environment in river sources proved to be issues of power relations in which the framework of political ecology has contextualized its understanding. It has been also depicted that in tracing the extent of the severity of degradation of environment in the river sources in Mbeya the British colonialists were not realistic. There were little investigations on declining amount of water in river sources apart from that which was done by EAAFRO under H.C. Pereira in Mbeya Range in the late 1950s. The discussion in this paper confirms the argument which cements that British colonial incorporation of local institutions in indirect rule apart from its other weaknesses resulted in divorcing local people from their chiefs, elders and management of resources (Perham, 1935: 17-18). Based on the above conclusions, the discussion ends by recommending the involvement of local people with their historical ecological knowledge in conservation of natural resources.

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