

### 3. Effect of canal-digging

Between 1942 and 1952 there was an intensive channel digging programme, first to improve communications so as to administer the area efficiently and **secondly** to drain the flow of water into desired directions to drain flooded areas of the swamps ( Map XI ).<sup>139</sup> Construction of these canals and channels produced temporary benefits. For a while all centres of population in the swamps could be reached at any time of the year using motor boats, and administration eased. The water level in the Lunga sandbank dropped and some land recovered for agriculture. For a while a few fishing grounds previously inaccessible could now be reached, and fishermen transported their catches to the mainland faster.<sup>140</sup> However, the opening of these canals needed constant maintenance. Channels had to be cleared of blockages or encroachment of papyrus and weeds. Accumulated sand and silt had to be constantly removed to maintain the deep level of the channels and canals for vessels to continue passing through.<sup>141</sup> This exercise proved exacting and expensive and with time maintenance work became lax. By 1960 the advantages gained by their construction started to disappear. Most of the channels became overgrown with weeds or silted up, making it difficult for big boats to pass as channels became shallow. Machines used

TABLE TO ACCOMPANY MAP SHOWING CANALS DUG IN BANGWEULU

1. The Kansenga Cut made between 1942 and 1944.
2. The Churchill Canal completed in 1944.
3. The Kalimankinde-Ncheta Canal completed in 1945.
4. The Brelsford Canal completed in 1944 in the lower Luapula.
5. In 1945 the Tushingo Canal was cleared to connect the southern end of the Kalimankonde-Ncheta Canal with lake Chale.
6. In 1948 the Miloki Cut was made to connect the upper Luapula with lake Kangwena.
7. The Debenham Cut was dug in 1949 to redirect the Chambeshi to its old course.
8. In 1950 a channel was cleared to connect the Kantini lagoon with Ncheta island.
9. In 1952 a new channel was dug south-west of Matongo between Kasela and Luina lagoons to relieve flooding on the western shores of Matongo and Ncheta islands as a result of the Debenham Cut.
10. In 1952 a canal was dug to connect Mpanta Point with the Lunga Sandbank.

in clearing channels became old and inefficient and were not replaced by new ones.<sup>142</sup> Most of the advantages that had been gained were lost, and it became more difficult to carry out development programmes under such an intractable environment.

#### 4. Livestock position.

Surviving livestock was now unimportant in the economy: sheep and goats were on the decrease. Averaging at 1500 in the early 1940s the number of sheep dropped down to about 1000 in 1950, and remained in that range until 1960.<sup>143</sup> Most of the sheep were still found on the lake islands, especially Chilubi; and the goats in the Bemba section of the mainland in the north-east. The problems of livestock keeping in Bangweulu have already been outlined, but one can only add that sheep keeping was further discouraged in the 1940s by the introduction of a £1 to £2 tax per herd by the Unga Native Authority. Many people to avoid this tax killed off the remaining sheep.<sup>144</sup> A total livestock population of 2,000 against a 71,000 human population brought very little return.

#### 5. Game situation

Game in Bangweulu continued to decline further. Many areas which had a lot of animals in the past now had

none. There were not ~~more~~ than 300 lions in 1960, and all confined to south-east Bangweulu with prides that never exceeded 4 while in Hughes times prides of 17 were common. Elephant, rhinoceros, buffalo and puku previously common in many localities were now confined to the Kasanka Game Reserve; and rhinoceros in the Lumbatwa area.<sup>145</sup> Decline has been caused by increased hunting pressure as the human population has increased. Lechwe did not decline as much as in the previous period. Between 1954 and 1966, the lechwe population stabilized around 16,000 owing to preservation measures.<sup>146</sup> However lechwe ceased to exist in many places. Lechwe on the southern tip of Mbabala island ~~were~~ exterminated. There were no lechwe in the central swamps. Only 200 lechwe out of 2,000 seen in 1935 at Kansenga remained in 1954. Increase in the human population led to drastic reductions of lechwe in the northern and western shoreline, and along the Chambeshi and Pambashye regions. Only a few lechwe were found along the swamp line south of lakes Kampolombo and Kangwena, the Lufwishi river and in Yongolo compared to the large numbers that were once found in these areas. The main concentration was this time restricted to the area stretching from Mbo Island to Nsalushi along the floodline.<sup>147</sup> Only

Sitatunga was still numerous in the reeds and papyrus. Decline in the game population led to diminishing returns and there was therefore a corresponding decline in hunting, especially that now there was greater emphasis on fishing for protein and to earn cash.<sup>148</sup>

Table VII: BLACK LECHWE POPULATION IN BANGWEULU <sup>149</sup>

<u>YEAR</u>	<u>NUMBERS</u>
1900	1,000,000 (missionaries)
1922/24	650,000 (G. Howe, District Officer Luwingu)
1931	150,000 (Pitman)
1944	30,000 (Brelsford)
1954	16,000 (Vesey-Fitzgerald)
1959	16,000 (Aerial Census, Game Department)
1973	22,000 (Grimsdell and Bell)
1975	30,000 (Manning)

#### 6. Labour Migration

Labour work continued to constitute a major form of earning money in Bangweulu. There was an average of 50 per cent able-bodied males away for work at any given

time in the districts surrounding the swamps.<sup>150</sup>

Labour migration was higher in those areas without viable commodities for sale to earn cash. This was mostly in the north-east on the plateau in the chieftaincies of Chipalo, Katuta, Shimumbi, Tungati, Chungu and Chitembo where taxable male absence varied from 60 to 70 per cent from year to year and from area to area.<sup>151</sup> Most areas along the shore where people concentrated on fishing but also practised agriculture the number of males away for work was around 50 per cent, especially in the chieftaincies of Mibenge, Chama, Mulakwa in the Kapata peninsula area. In the Kalasa Mukoso's area where agriculture was still good people earned a limited amount of money through sale of crops, labour migration was lower, and there were about 40 per cent taxable males away.<sup>152</sup> Absence for work was lower in Kasoma Bangweulu's area (about 37 per cent) because fishing, agriculture and trading activities with the growth of Mwamfuli village and Samfya as an administrative and missionary centre provided employment.<sup>153</sup>

The Unga area in the swamps recorded the lowest rate of males absent, about 22.4 per cent because it is here where the fishing industry was greatest. The lake island with increasingly poor agricultural yields and declining fish harvests also recorded high labour

migration between 1950 and 1960 with about 50 per cent able-bodied males away for work.<sup>154</sup> Differential response to work was still dictated by availability of economic activities within each region. Areas with the highest percentage of absent males were those without means of earning money locally. Decreased opportunities for earning cash increased periods of absence from home since 1950. The north-eastern part of the Bangweulu mainland in 1952 for example had 21.3 per cent adult males away from home for 10 years, and 55.4 per cent away for 5 years.<sup>155</sup> Increase of labour migration with the decline of economic opportunity points out to the fact that labour migration developed because of rural deterioration rather than labour migration itself causing underdevelopment. Absence of many men caused a decline in cassava yields because there were now fewer men to clear virgin land for new fields. Most of the villages looked dilapidated, and there was an increase in unattached women.

Owing largely to ecological problems the Bangweulu economy was becoming less and less viable. Agriculture on the swamp islands and along the shoreline was declining very rapidly because of soil exhaustion, overcrowding due to the land shortage created by the 1936-1944 floods and population increased, and deforestation worsened. On the mainland where government agricultural schemes were concentrated agriculture did not improve because the

plans were either ill-conceived or not implemented properly. Fish production could not be increased because some areas were overfished, traditional methods of fishing were ineffective for some parts of the fishery, the transport system and the marketing of fish could not be improved, and the many uses to which fish was put for an increased human population. In a situation where livestock and game were now of marginal value there was increase in labour migration in all parts of the Bangweulu region which was not the case in the previous period.

c. COMPARISONS AND CONTRASTS

Namwala and Bangweulu suffered from ecological problems in agriculture. Most of Namwala could not realize high crop yields because of poor soils and climatic irregularities. Although the whole district increased its maize sales in response to good marketing organization, most of this production was in the Mbeza area where soils and climate were more favourable. In Bangweulu the swamps experienced a lot of food shortages, and production on the shoreline was increasingly becoming poor because of the deterioration of soils caused by floods and natural increase in population. Only on the mainland were people able to sell limited quantities. Whereas there were few agricultural plans in Namwala

development schemes carried out in Bangweulu were so ill-conceived that they failed to make an impact on agriculture.

Dependence on fishing as the main economic activity to earn money and barter for food caused a rapid growth of the fishing industry. Suffering from many ecological constraints and marketing problems, and the large number of people who depended on fishing, fishing brought in declining returns. In Namwala fishing was still largely subsistence, but there was a gradual increase in commercial fishing as more and more fishermen from other parts of the country and Central Africa were taking part. The reason for this is that in Namwala money could be earned by selling cattle and maize, while in Bangweulu people did not have a commodity to sell other than fish.

With restricted ways of earning money Bangweulu experienced a high rate of labour migration, even in the swamps. In Namwala wage labour was still of marginal importance except in economically poor areas such as the tsetse fly infested areas.

There was serious decline of game in Namwala because of chilas which were increasingly becoming destructive. In Bangweulu decline was becoming more

gradual as hunting efforts yielded little return, and with growing emphasis on fishing hunting for commercial purposes decreased. It is however interesting to note that in the 1940-64 period when there was the greatest number of laws enacted and changes affecting game, in contrast with the previous period; when game policy was poorly developed Namwala experienced serious decline of game.

One of the weaknesses of the game laws is that they tended to perpetuate old ideas and structures. The 1941 Ordinance merely preserved the idea of National Parks and Game Reserves already in force by the 1925 Game Ordinance. The Controlled Areas also introduced by the 1941 Ordinance failed to protect game as chiefs found them likeable because they reserved the lion's share of game to local people and in 1954 it was found that they had served little purpose as there was virtually no game in most of the Controlled Areas and were therefore discontinued.<sup>156</sup> Similarly in the First Class Hunting Areas game control failed because the limitations provided for by licences were not observed when hunting took place. They also failed to realize that game decline in each area was by the inhabitants and not by outsiders who were now excluded. Demarcation was also not properly done so that many people did not know the boundaries for

Game Reserves and hunting areas on the ground. Moreover there were only 6 game kapasus in the whole country to implement the changes.<sup>157</sup> Introduction of Game Management Areas in 1962 to replace controlled areas (known as Mazabuka, Kafue, Namwala and Nkala) was little more than a mere change in name only as they were not accompanied by any new tough measures.

Tightening of licence control measures introduced by the Game Ordinance of 1962 was a misplaced effort since it was not only the licensed hunters who engaged in hunting. In fact when it came to day to day hunting and game drives with spears and dogs a game licence was irrelevant. Few hunters, if any, adhered to the limitations provided for by the licences in the absence of close inspection. The raising of the licence fees was useless as hunters could raise much more money from the sale of meat.

Another problem with the game preservation measures is that they often came after animals had already been slaughtered. The Kafue National Park was, for example, not declared until 1950 although it was realised that hunting on the Kafue Flats was serious earlier than this. The Park itself covered only a small part of the Flats, leaving the eastern portion

with its abundant game untouched. The National Parks that actually covered the Flats were not declared until 1972 and 1973; Lonhinvar and Blue Lagoon National Parks respectively, and this was after serious inroads into the game populations had been made. In Bangweulu it was the same problem, and of the Parks created none covered the Mbo-Nsalushi frontage with the greatest concentration of game.

In an effort to accommodate African meat requirements, provisions for Africans to hunt game were made in the laws which augured very badly for game. In Namwala chilas were not prohibited until 1955 with the passing of the Fauna Conservation Ordinance. Even after the enactment of the law provision was made for three chilas in each year in 1956 and 1957 after representations were made that the suppression of traditional hunts imposed unnecessary hardship on the people's traditional source of meat. The result was great destruction of lechwe which I have already alluded to. In Bangweulu hunting drives became illegal in 1948, long after game had declined. If lechwe drives had been stopped earlier than that time the harm done to these animals would not have been as great as it was.

The putting of animals on the protected list was contradictory to other game laws. Lechwe in Bangweulu was put on the protected list in 1945, yet game drives against lechwe were not outlawed until 1950.<sup>158</sup> On the Kafue Flats it was the same. On the north bank of the Kafue river lechwe in the Namwala and Mazabuka districts was put on the protected list in 1950, and on the south bank where most of the lechwe chilas took place, the action was delayed until 1957. Before that time lechwe on the south bank was a scheduled animal which could be hunted using an ordinary licence, though the use of that licence was not observed at all in chilas and in day to day hunting. In spite of this protection chilas were not stopped altogether until 1958.<sup>159</sup> In Bangweulu the hippopotamus was put on the protected list in 1944 after the animal had been practically wiped out, only in Kafue was the measure timely and effective. Introduced in 1950 the measure resulted in a rapid increase of the hippopotamus to the extent that it started ravaging crops.

Equally useless was the putting of animals on schedules as is shown by the commercial exploitation of the crocodile. The crocodile was on the Ordinary and Restricted Licences. Each hunter was allowed to kill one for each licence. In 1962 it was found that the

killing of the crocodile for skins which had been fetching good prices since 1950 had reduced the reptile seriously. Crocodile killing became more intensive when it was discovered that it could be hunted legally in 1962, and people went so far as to use illegal hunting methods, especially the baited snare. There was complete disregard for the numbers allowed, and people did not even bother to get the necessary licence to kill the crocodile.<sup>160</sup>

Game laws have failed because they were misunderstood by the people involved. People could not understand why they were prevented from hunting in the areas that they used to in the past. With this in mind demarcation of land into National Parks, Game Reserves, Controlled and Game Management Areas was not respected. The measures, as all colonial measures, were looked upon as ways of trying to frustrate African life, more so when Europeans using licences could hunt in the same areas where Africans were refused to hunt and European tourists allowed to view game. There was also no effort made to educate the Africans on the new changes until 1964 when this was done on a small scale. For the most part Africans could not appreciate the concept of poaching because it was alien to their way of life.<sup>161</sup> Hunting in Game Reserves

and National Parks therefore continued, and in 1951 poaching was reported to be rife in the Kasanka and Isangano Game Reserves. Lochinvar itself on the Kafue Flats was heavily poached as it lay in the traditional hunting and grazing areas for people in chiefs Chongo and Siamusonde. The problem at Lochinvar was worsened by the fact that the game guards had been in the area for too long and too familiar with the local population and therefore reluctant to make arrests. Control of poaching was further discouraged by the time it took to get punishments meted out by the courts from the time of arrests and very often after lengthy litigation accused persons were often acquitted.<sup>162</sup> It is against this background that decline of game in this period took place in the two areas, especially in Namwala.

In both areas there were a number of efforts made to ensure proper utilization of natural resources. Measures were taken to preserve fish by the introduction of fish licensing and fish regulations, stationing of fisheries officers at the two fisheries, and establishment of Fisheries Research Units at Samfya and at Lochinvar. There were agricultural improvement schemes on the mainland in Bangweulu (although agricultural problems were ignored in the swamps) while in Namwala marketing facilities

were extended to most parts of the district. Both areas had tsetse fly problems but there were more concerted measures of tsetse control in Namwala where trypanosomiasis was threatening large cattle herds than in Bangweulu where sheep and goats were left to suffer from other diseases unattended.

While water development in Namwala was almost exclusively confined to the provision of water in the chieftaincies further away from the Flats, in Bangweulu more attention was paid to the excavation of canals and channels and clearance of the main water routes throughout the swamps for water transport to be improved and made more efficient. A lot of energy was also spent trying to drain the Lunga Sandbanks inundated by the 1936-1944 floods. Conservation of forests was on a smaller scale in both Namwala and Bangweulu compared to other parts of the country. In Namwala the Ila Native Authority agreed to protect forests south of Namwala, and this in 1953 led to the establishment of a Forest Protected Area in the southern part of the district.<sup>163</sup> Although the Samfya Protected Area was established south west of Samfya in 1952, the main emphasis in Bangweulu was afforestation on the swamp islands which by this time had virtually no trees.<sup>164</sup> Starting in the early

1940s planting of gum and eucalyptus trees was going on in swamps.

Unlike Bangweulu, Namwala as part of the lower Kafue river basin was from 1950 onwards subjected to a number of surveys dealing with the overall natural resource use. After conducting investigation in the region C.G. Hawes in 1951 made recommendations for the construction of a dam at Itezhitezhi which would make it possible for large-scale irrigation development to take place using canals from the dam. The report also recommended that a hydro-electric power station be built at Kafue Gorge,<sup>165</sup> In 1956 the Kafue Pilot Polder Project was started at Nanga near Nega Nega by the Rhodesian Selection Trust Group of Copper Mining Companies to investigate the suitability of the soils in the Kafue Flats for large-scale irrigation development. At the same time a scheme to establish suitability of sugar plantations in the Nakambala area of Mazabuka was going on. In 1960 the Ministry of Land and Natural Resources issued a report following upon investigations on the possible resource use in the Kafue River Basin. The report provided information on the natural resources potential in the region and related data such as population distribution, communications, nature and extent

of agriculture and forestry, livestock and wildlife position, and control of the Kafue river for hydro-electric development.<sup>166</sup> In 1963 proposals of the West Namwala Development Plan were put before the District Team for Namwala and the Ila West Namwala Development Committee. The plan aimed at compensating the loss of rights in the areas of chiefs Kaingu, Shezongo, Musungwa and Shimbizhi caused by the institution of the Kafue National Park in 1951. People in these chieftaincies were no longer able to hunt, collect honey or fruits, fish or graze their cattle in the area now covered by the Park. The plan therefore wanted to create additional economic activity to replace those that were lost. This entailed encouragement of Kaingu's people to fish below Itezhitezhi, train them to fish using gill nets and help them trade the fish. Agricultural production was to be enlarged by mechanisation and cattle increased by eradicating tsetse fly. In most respects the plan was similar to the development projects already going on in Namwala.<sup>167</sup>

All these investigations culminated in the 1968 multi-purpose survey of the Kafue river basin covering all aspects of the ecosystem and how they would be affected by an integrated development of the natural

resources in the region, that is hydro-electric power development, wildlife, livestock and agriculture.<sup>168</sup>

It is on the basis of these surveys that resource development projects were carried out in the Kafue Flats in the late 1960s and early 1970s. Bangweulu did not have similar surveys: those that were carried out were for the most part confined to the hydrology of the swamps. The only plan which had a parallel in the Kafue area is the Bangweulu Zone of Intensive Rural Development in 1950. For the Kafue area the plan was called the Kafue Zone of Intensive Rural Development. The plan would by and large be implemented by Area Teams for the two regions. The main aim was to establish African farmers on the land on the basis of peasant agriculture. In Bangweulu emphasis would be on rice production and the possibility of introducing cattle in the area. In Kafue movement from overcrowded areas would be encouraged, and although people would at first be required to grow subsistence crops such as maize and groundnuts efforts were to be made to find crops of higher cash value. In Bangweulu officials from the agricultural department would endeavour to find suitable areas for the planting of trees and demarcate forests with valuable indigenous

timbers. Fishing would be studied and a co-ordinated system of communications developed involving road, river, lake and swamp to reduce the cost of transporting produce out of the region.<sup>169</sup>

With all this planning to harness the environment one should have expected promising economic development in both areas. Unfortunately this was only true for some aspects of the economy such as cattle increase and increase in maize produced in the Mbeza area in Namwala. Ecological problems in other parts of the ecosystem still remained intractable because of poor efforts to implement the schemes and plans envisaged. In Bangweulu agriculture continued to decline, the fishery facing many ecological problems; there were problems of fuel and building materials owing to deforestation, and transport problems remained unsolved owing to weed growth and silting of channels. There was therefore too much planning and little implementing ability.

### Conclusion

My conclusion is that ecological constraints were still serious in the economic development of Bangweulu and Namwala. Response to new market opportunities was dependent on ecological constraints:

where ecological problems were less severe people were able to sell agricultural products, while in Bangweulu exploitation of wasting natural resources accelerated decline of the environment and dependence on fishing. Whereas development schemes in Namwala were showing signs of success, and the district on the threshold of recovery at the close of the period decline in Bangweulu looked irreversible with the failure of most of the development projects. Only game policy was slowly stabilizing the lechwe population at 16,000 while in Namwala game policy failed to arrest decline of game in this period. Game there started to increase after 1964.

FOOTNOTES

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## CHAPTER V

### CONCLUSION

I have shown how the economies of the two regions were suited to the environment in the 1850-1910 period. It has also become apparent that flooding played an important part in the economies and ecologies of the two areas. Floods regulated the grazing patterns of livestock and game, floods were important in the breeding of fish and in fishing activities, floods influenced human settlement, they affected agriculture by inundating land or destroying crops; floods influenced man's movement and the transportation of his products. Indeed life in Bangweulu and Namwala revolved around the annual flooding of the plains and swamps in these areas and the kind of ecosystem it brought into being. We saw how agriculture varied according to the soils and vegetation found in each area. Agriculturally poor areas developed other economic activities such as the collecting of wild fruits and roots in the western chieftaincies of Namwala, emphasis on fishing in the Twa area and at Itumbi in Namwala and in the Bangweulu swamps region. There was also regional specialization in the economic activities and production of commodities, and this gave rise to trade between different areas in each region thereby

encouraging regional inter-dependence. In Namwala for example, concentration on cattle-keeping in the Maala-Baambwe area led to poorly developed agriculture. In Bangweulu interest in fishing discouraged agricultural development. Salt produced at Basanga was sold throughout the Kafue Flats in exchange for other commodities: in the same way iron ore smelting and the metal tools manufactured at Chishinga led to trade in other items with the rest of the Bangweulu area. It is into these economies of self-sufficiency that colonial rule and western capital moved.

I have also shown that as colonial rule was strengthening its hold on African people traditional economies did not only develop strong links with western capital but became dependent on it for prosperity. Each region's attachment to the world economy hinged on the viability of its traditional economy, that is whether or not it had resources to survive world economic crisis or to resist adverse colonial intentions, such as the imposition of tax to release labour for mining and industrial establishments in Southern Africa. Integration of traditional economies into western capitalism was also influenced by the seriousness of ecological constraints on increased production in agriculture, animal husbandry and fishing, and the limitations of production based on

wasting natural resources. Geographical location in relation to the lines of communication and main centres of western capital was important in the way a particular area became tied up with the world economy and its demands. All these factors taken together determined the success of colonial policies for each region: thus extraction of labour was more successful in Bangweulu than it was in Namwala. It is also against this background that response to the new demands either meant deterioration of the environment or gradual improvement of the ecosystem. These factors also accounted for the success or failure of environmental control measures. Whatever response was elicited in each area introduction of the money economy and western-manufactured goods led to a gradual disappearance of traditional crafts.

Having said this one can now move on to the specific ways in which this study is different from other environmental studies. One of the things this study has demonstrated is that ecology is a major factor in economic development and in a people's reaction to government policies. In both areas adverse ecological factors: irregular climate, floods, pests and poor soils, hindered agricultural development, and lowered production when markets were favourable. This was

especially true in Namwala, while in Bangweulu the poor nature of the soils prevented the growing of crops on a large scale other than cassava, and an expanding population in a limited area led to poor agriculture because of shortage of land for the traditional methods of farming. Ecology also played a major part in livestock keeping. While cattle existed in large numbers because of good grazing grounds on the Kafue Flats, it is also ecology which determined the economic use of cattle. The existence of tsetse fly and other diseases severely limited the growth rate of the cattle population, and influenced distribution of cattle within the district. Outbreak of pleuropneumonia in Barotseland for example encouraged inbreeding, and the outbreak of diseases affected cattle sales, and the direction of movement of cattle sold. Cattle could easily be sold to Lusaka on the North Bank of the Kafue, but fearing to spread diseases cattle sold had to be moved south to the Livingstone abattoir. In Bangweulu cattle could not be kept because of tsetse fly, and the sheep and goat populations were seriously affected by disease from time to time. Moreover the swampy nature of the landscape meant that animals could not be kept in many parts of the district. On the other hand the natural resources found in each region: game and fish, were very

important in the economies of the two areas. In Bangweulu they formed the main means of earning money: sale of game meat and skins, and later sale of fish. Bangweulu was able to support a large population because of the various uses fish was put to. On the other hand commercial fishing for the Ila in Namwala was low-keyed because of other economic alternatives. Yet in both areas it was the ecosystem that accounted for the existence of such large quantities of fish: the water, grasses, insects and other living organisms on which fish feed. People in each region responded to government policies by either making use of their accumulated wealth, or exploiting the wasting natural resources and therefore caused further degradation in the environment. The study also demonstrated that people responded to labour migration depending on whether or not their environment had resources within it to get cash. People in tsetse fly-infested areas in Namwala, and mainland areas in Bangweulu left for work in bigger numbers than in the areas favourably endowed by nature.

This leads me to my second conclusion, which is that accumulation of indigenous wealth provided a means of resistance to colonial measures. Namwala people successfully resisted pressures to migrate for work because they could meet the tax imposed on them for this

purpose owing to the fact that they had accumulated wealth in the form of cattle. On the other hand the labour-market based economy in Bangweulu, dependent on the colonial economy was vulnerable. It experienced booms as long as there was a good market for its commodities, and employment opportunities. When these vanished the economy suffered. Lacking accumulated wealth people were amenable to the colonialists' intentions, that is extraction of labour from the Northern Rhodesia colony for the mines in South Africa, Southern Rhodesia and Katanga. The desires of the colonialists were therefore fulfilled in Bangweulu, but frustrated in Namwala, and so represented uneven penetration of capital.

Pressure on game was uneven although policy was the same for both areas. This is shown by the fact that game declined in the two areas at different times. In both cases game hunting became destructive when animals were killed for sale: this occurred in the 1910-1940 period in Bangweulu, and in Namwala in the 1940-1964 era. The crucial factor was not the enactment of laws and creation of Game Parks and Reserves, licences, schedules of animals on the protected list. These were too weakly enforced to be observed, and with the contradiction in the concept of the uses to which game should be put by

colonialists and Africans, the latter did not feel obliged to observe the innovations by the former. Undoubtedly the existence of cattle and sale of agricultural produce in Namwala, and distance from the urban centres delayed massive exploitation of game.

The extent to which ecologies and economies were undermined in the early stages of colonial rule determined the way the two areas responded to development measures after 1940. Namwala having had a more solidly based economy showed signs of recovery in agriculture and livestock, whereas Bangweulu which was dependent on wasting natural resources proved more intractable in economic development. Otters and game having been decimated, there was heavy reliance on fishing which due to the large population was overstretched. Efforts to reduce problems in fishing failed, so did attempts to improve agriculture because of shortage of land exacerbated by the 1936 floods. While prospects were bright for Namwala, the future for Bangweulu looked gloomy.

Apart from merely seeing colonial rule in Zambia as a machinery which accelerated degradation on the land I have also shown that the colonial government tried to control ecological problems which had arisen either through its policies to the African peoples or through diminishing natural resources under an expanding human population.

This environmental control expressed itself through development plans and schemes, especially after 1940, through the creation of government departments or expanding the operations of those already existing, and through the enactment of laws and enforcement of regulations to deal with particular natural resource problems. I have also shown how most of these measures failed because they were ill-conceived or poorly implemented. Where the nature and extent of the problem was properly perceived, and enough funds and personnel released to carry out environmental control efforts noticeable success was achieved. A good case in point were the Tsetse Control schemes in Namwala where limited control of trypanosomiasis led to considerable cattle increase. Unfortunately the vigour employed to improve the Bangweulu fishery and crop production in both areas was less persistent than that for tsetse control; so success in these fields was limited and temporary. Game preservation measures failed because they failed to take into account the African people's feelings to wildlife.

Lastly the study goes a long way to show the need for detailed local studies of man and the environment as no single model of ecological and economic change can apply to areas of Zambia as a whole. The Vail/Kjekshus

model applies only in part to Bangweulu but not to Namwala. It is not always right to look at colonial rule as a vehicle of environmental deterioration. Nor were natural disasters always followed by colonial policies that had adverse effect on African societies. It would be an overstatement to call ecological constraints that evidenced themselves in Bangweulu and Namwala disasters. It has also become clear that colonial policies did not in fact worsen these constraints, on the contrary the colonial government tried to control them though unsuccessfully. The correlation of an increasing human population leading to diminishing returns in the exploitation of the natural resources as in the Guy postulate does not fit in that neatly either in the Bangweulu or Namwala cases. Where it does marginally apply, that is in the Bangweulu study, other factors are present; the growth of the Copperbelt and the First World War increased game destruction and the 1936-1944 floods led to a rapid deterioration of the soils. Besides it has already been observed that floods had a rejuvenating effect on the grazing grounds and the fishery on the Kafue Flats, a variable independent of population increase or colonial policy. Nor is the emphasis on the crushing of an emergent peasantry postulated by Palmer and Parsons and other writers sufficient to explain the changes that occurred

in each region. Neither in Bangweulu nor in Namwala can one talk of a distinct class of peasants responding to new market opportunities as was the case in Southern Rhodesia and South Africa. At any particular time response to markets was governed by the availability of commodities for sale as an alternative to wage labour. Mechanisms to suppress African enterprise were less overt in both areas, and where they existed it was in their general application for the whole country. After all applying Lonsdale's Kenya model to Zambia and to the two areas, it has become evident that the colonial state at various times tried to promote peasant and settler production either simultaneously or one after the other. We have for example seen how development schemes were undertaken to increase African production. There is also a degree to which Iliffe's division of Tanganyika into three economic regions becomes applicable to the two areas under study. Bangweulu was intended to supply labour to the mines and to a certain degree it was the hope of the colonial government to have Namwala supply food to the urban areas, especially in the Southern Province. Colonial rule did not succeed in controlling environmental problems. Only in the control of trypanomiasis and other cattle diseases in Namwala was partial success achieved. The study has also clearly shown

that the environment in Namwala and Bangweulu did not degenerate because of colonial policies as was the case in Tanganyika and the Eastern Province in Zambia. My study therefore has shown that it is necessary to study the impact of colonialism on any particular region of the country because generalizing from the findings of the studies that have been conducted so far can lead to wrong conclusions about the effect of colonial rule on the environment and economic development.

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B1	28/9/78	Musamba Shimeo	Mwamfuli	Kasoma Bangweulu
B3	29/9/78	E. Shintumbanuma	Mwamfuli	Kasoma Bangweulu
B4	29/9/78	Pendakufwa Mwamfuli	Mwamfuli	Kasoma Bangweulu
B7	29/9/78	Andrew Yamishi	Mwamfuli	Kasoma Bangweulu
B10	1/10/78	James Lupapula	Mwamfuli	Kasoma Bangweulu
B13	30/9/78	Kasoma Bangweulu	Kasoma	Kasoma Bangweulu
B15	30/9/78	Yumba Mpanda	Mwamfuli	Kasoma Bangweulu
B16	1/10/78	Cypriano Maabo	Mwamfuli	Kasoma Bangweulu
B17	2/10/78	Maria Chanda	Nsamba	Nsamba
B18	3/10/78	Mulondwani Mubende	Milambo	Mulakwa
B22	5/10/78	Tuta Mukosa	Mukosa	Bwalya Mponda
B23	5/10/78	Munkonje Maabo	Mukosa	Bwalya Mponda
B25	7/10/78	Buleti Musebo	Mumba Mwewa Nsamba	
B26	6/10/78	Mufute Bwalya	Bwalya Mpanda	Bwalya Mponda
B27	7/10/78	Chief Nsamba	Nsamba	Nsamba

B29	6/10/78	Mumbwa Chulu	Matolongo	<b>Bwalya Mponda</b>
B30	6/10/78	James Mwewa	Matolongo	<b>Bwalya Mponda</b>
B31	6/10/78	Shambalakale Kampufi	Bwalya Mponda	Bwalya Mponda
B32	6/10/78	Benjamin Mutoni	Bwalya Mponda	Bwalya Mponda
B33	6/10/78	Lemon Bwengu	<b>Bwalya Mponda</b>	Bwalya Mponda
B34	6/10/78	Shimumbi Kambili	Bwalya Mponda	Bwalya Mponda

II) KAFUE FLATS

Number	Date	Informant	Village	Chief
K1	4/11/78	Amos Malambo	Choongo	Choongo
K2	4/11/78	Judah Bbuku	Musenge	Choongo
K3	4/11/78	Anderson Nzala	Musenge	Choongo
K4	4/11/78	Goerge Maimbo	Maimbo	Choongo
K5	5/11/78	El son Mulebwente	Maambo	Choongo
K6	5/11/78	Jonah Chaahwa	Maambo	Choongo
K7	7/11/78	Manchisi Munan'gandu	Haloma	Choongo
K8	8/11/78	Davidson Banji	Banji	Siamusonda
K9	14/11/78	Shimaluwani Mukobela	Baambwe	Mukobela
K10	14/11/78	Mwanapwayankali Muyankwe	Baambwe	Mukobela
K11	14/11/78	White Mwise	Baambwe	Mukobela
K12	14/11/78	Enock Syalandwe	Baambwe	Mukobela
K13	14/11/78	Sheleni Shichanda	Baambwe	Mukobela
K14	14/11/78	Thomas Chikwata	Baambwe	Mukobela
K15	16/11/78	Waterfold Kasanga	Maala	Mungaila
K16	16/11/78	Mpondo Syaiebwe	Maala	Mungaila
K17	16/11/78	Henry Shamalemo	Maala	Mungaila

<u>Number</u>	<u>Date</u>	<u>Informant</u>	<u>Village</u>	<u>Chief</u>
K19	8/11/78	Joel Hampongo	Wanwela	Siamusonde
K20	8/11/78	Hasalama Chuunka	Chuunka	Siamusonde
K21	8/11/78	Jairos Masenge	Masenge	Siamusonde
K22	8/11/78	Albert Habwacha	Chilomo	Siamusonde
K23	9/11/78	Mwanachi Mbayi	Kamulonga	Siamusonde
K24	9/11/78	Moono Muhila	Muhila	Siamusonde

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