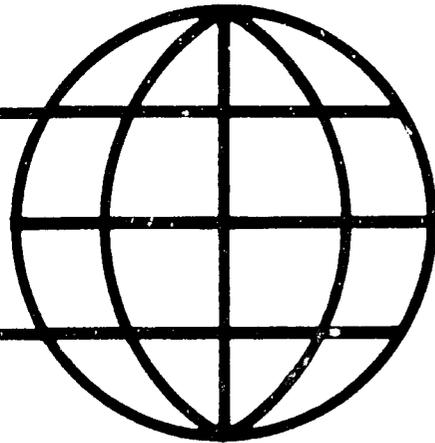


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**COOPERATIVE AGREEMENT ON HUMAN SETTLEMENTS  
AND NATURAL RESOURCE SYSTEMS ANALYSIS**

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REGIONAL PLANNING FOR PEOPLE, PARKS, AND  
WILDLIFE IN THE NORTHERN PORTION OF THE  
SEBUNGWE REGION, ZIMBABWE

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## I. INTRODUCTION

The Sebungwe Region, as defined by the various government departments involved in the Sebungwe Regional Plan, includes Binga and Gokwe Districts and parts of Kariba and Gatooma Districts. Covering 3,882,000 hectares, this region is 61 percent Communal Areas (formerly Tribal Trust Lands), 9 percent National Parks, 6 percent Lake Kariba Recreational Park, 8 percent Safari Areas, 5 percent forest land and 10 percent land classified as "other." The human population of the region is estimated at approximately 350,000 people, the large majority of whom live in the southern portion of the Sebungwe. Linguistically, most speak Shona as their first language, whereas the largest single language community in the less densely populated northern portion speak Tonga as their first language.

In addition to 350,000 people, whose numbers are increasing rapidly due to high birth rates and in-migration, the Sebungwe Region also contains major game and scenic areas, including two national parks and a number of big game safari areas. To head off increasing conflicts between people and game (which would probably lead to depletion of the latter before the end of the century if present trends continue), officials working within the Sebungwe called for a coordinated planning effort. This request was proposed to the Standing Committee of the Agricultural and Rural Development Authority (ARDA) which in turn, established a sub-committee "to produce a regional plan for the area."<sup>1</sup>

The purpose of this report is to provide the regional planners with more information on the people of the northern portion of the Sebungwe Region (especially on their economic activities) and on possible development options for the area which will facilitate the coexistence of both people and game. It deals primarily with the northern Sebungwe because that is the area with which I am most familiar. For the past 25 years, Professor Elizabeth Colson of the University of California, Berkeley, and I have been carrying out research among the Tonga-speakers of the Middle Zambezi Valley. Planned from the start as a longterm study, this research was motivated by the Kariba Dam Scheme, its intention being to describe the way of life of the local people both before and after Kariba's construction. The initial research was carried out over a twelve month period during 1956-57 just prior to the relocation of approximately 57,000 people. Further research was undertaken in 1960, 1962-63, 1965, 1967, 1968, 1969, 1970, 1972, 1973, 1976, 1978, and 1981-82. During this period Colson and I have spent approximately eight years collecting information in the field with at least another eight years spent in

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<sup>1</sup>ARDA Minutes, 6 July, 1979.

analysing and writing up the results. Shorter periods have been spent on the study by our colleagues Roger Noll and Mary E. D. Scudder. Though most of the research has been carried out in Zambia, the fieldtrips were made through the northern portion of the Sebungwe Region in 1956-57, 1962-63 and 1982. These trips plus a few reports by others (especially Weinrich) have convinced us that it is possible to discuss the Valley Tonga in both Zambia and Zimbabwe as a single people sharing a basically similar culture.

From the start our role has been that of researchers collecting and analysing detailed data on settlement patterns; population dynamics; economic organization (including both subsistence techniques and money earning activities); social life within family and community; political organization at the community, neighbourhood (corresponding to chief's area in Zimbabwe), and district level; and belief systems. We strongly believe that our research findings have considerable relevance for attempts by the Zambian and Zimbabwean governments, and by non-governmental organizations (NGO), to improve the standard of living and way of life of the people. Indeed, we believe that our findings have major implications for development planning and implementation. We have discussed these in two 1982 reports written primarily for government and NGO officials and planners. The first was an analysis, with recommendations for future development, of the first ten years of the Gwembe South Development Project in Zambia's Sinazongwe Sub-District. The second is this report to the Department of Land Management of the University of Zimbabwe.

In April 1981 I wrote to the Zimbabwean Ambassador to the United States to inform him that Colson, M.E.D. Scudder and I were planning to return to Zambia later in the year to continue our research and would like to renew our research activities in Zimbabwe at that time. I also stated that we would like to make available to the government of Zimbabwe our more relevant research findings. He kindly forwarded our research proposal to Harare where it, along with other enclosures, was handed over to the Director of Physical Planning in the Ministry of Local Government and Planning. Through the Secretary of Foreign Affairs and Ambassador Mashingaidze, the Director informed us of the pioneering regional planning efforts currently under way in Sebungwe and suggested that we contact him on our arrival in Zimbabwe. This I did in March 1982. Contacts were also made with the Department of National Parks and Wildlife Management and with the University of Zimbabwe. These led to an agreement with the University's Department of Land Management to sponsor the field visits on which this report is based, with the United States AID Mission in Harare funding in-country costs through USAID's Cooperative Agreement in Integrated Area Development with Clark University and the Institute for Development Anthropology.

## II. PROCEDURES

The information on which this report is based is drawn from two major sources. The first is our twenty-five years of fieldwork within the Middle Zambesi Valley. Some of the publications resulting from this fieldwork are listed in the bibliography. The second major source of information are two fieldtrips made within the Sebungwe during July-August 1982. Between July 12 and July 20, Professor Colson and I were invited to accompany Professor Geoffrey Bond and Professor Marshall Murphree of the University of Zimbabwe on a trip up Lake Kariba on the University research boat Erica. During this period we were able to visit a number of kapenta and gillnet fishing camps, the University's Sinamwenda Research Station, and had extensive talks with F. C. Monkombwe (the Chairman of the Binga District Council) and with Tom Coffee (Agritex District Extension Officer). The latter hosted us on two days of inland travel to inspect agricultural projects and to visit village areas on the Manjoro Plateau, in the Lubu Valley, and around Kariyangwe.

The second field trip was from July 30 to August 12. At that time, Professor Malcolm Blackie, Dean of the Faculty of Agriculture and Professor of Agricultural Economics in the Department of Land Management and I made an extensive tour by Land Rover through the northern portion of Sebungwe. Entering and leaving the area through Gokwe, we focused our attention on the Sengwa River Basin -- looking into conflicting land and water use systems and development opportunities. Special attention was paid to areas utilized by chiefs Simunchembu, Siabuwa, Negande, Sinakatenge, Siamupa, Sinamwenda, Mola, and Sinamusanga. Visits were also made to Matusadona and Chizarira National Parks, Bumi Hills, two safari operations, and the Sengwa Research Station of the Department of National Parks and Wildlife Management. A brief side visit was also made to Binga District headquarters for further discussion with Agritex Officer Coffee.

Throughout both field trips our procedure was to discuss Sebungwe problems and potential with as many people as possible. Whether travelling by land or water, we were constantly stopping to talk with people we met along the way -- including those asking for lifts and those we sought out in fields, villages, stores, schools, fish camps, safari camps, hotels, and government offices. In this way information was systematically collected from several hundred people including farmers, fishermen, school children, teachers, storekeepers, safari and hotel operators, chiefs, district councillors, and government officials. Discussions were also held with officials in Harare during March, July and August 1982.

### III. STATEMENT OF THE PROBLEM

On renewing contact with the northern portion of Sebungwe, I was constantly made aware of three characteristics. First was the administrative complexity of the area which falls not only under four separate district councils and district administrations but also under three separate regions (Matabeleland North, Midlands, and Mashonaland West). Second was the rapid population increase among the people. Third was the regions' major natural resource potential (including not just fish and wildlife but also forest and mineral resources).

#### A. Administrative Complexity

If the region's very real potential for improved living standards for its inhabitants, for national development, and for international tourism is to be realized, novel administrative arrangements will be required and imaginative plans will have to be formulated and implemented. The Sebungwe regional planning effort under ARDA's sponsorship is a major step forward in the planning process. Its implications for a form of development which makes a region more habitable for its people and more productive for the nation without degrading its natural resources are profound not just for Sebungwe but also for the rest of Zimbabwe and indeed for Africa. On the other hand, regional planning is a very delicate operation which is constantly threatened by the more limited interests of the different departments involved. To succeed, the planning and implementation activities need be institutionalized in such a way that they can move forward relatively unimpeded by any departmental or institutional obstruction which may occur in the future. Three options on how regional planning and implementation might be institutionalized are presented in Section VIII of this report.

#### B. Population Increase, Population Planning, and Resettlement

The people of the northern Sebungwe have a high rate of population increase. This results not just from decreasing mortality (arising from such medical treatment as immunization against measles in young children) but also from an apparent increase in fertility. Though we have yet to analyse our detailed demographic data, it is clear to both Colson and myself that the interval between births has been decreasing over the years so that currently it approximates 24 months among younger women. In percentage terms it would not be surprising if the population were increasing at over 3 percent per annum.

As a result of population increase, the people are moving into areas of reduced agricultural potential which cannot support them. At the same time the carrying capacity in many settled areas of higher

agricultural potential has been exceeded under the existing system of production. In only a few areas, like Chief Simunchembu's, is good land still available, and even there the situation is made more complicated by an uncontrolled movement of people from other districts and areas. Such immigration is going on throughout much of Gokwe and Binga Districts. Much of it is illegal in that the approval of the relevant officials has not been received. In addition to political implications, it has very serious development implications since its continuance will eliminate many of the development options discussed in later sections of this report.

In dealing with population increase, many of those to whom we talked suggested population resettlement and population planning as the only viable solutions. While I agree that population planning is essential in the long run, it is unrealistic to expect it to precede significant increases in the people's standards of living or to be feasible in the absence of a national policy toward population planning. For the immediate future the best approach, indeed the only one, is to attempt a program of rapid development which will improve living standards. While such a policy in the short run will accelerate population increase even more by reducing, for example, rates of undernutrition, malnutrition, and tuberculosis (which are probably high by Zimbabwean rural standards), in the long-run, development, in conjunction with a population policy relevant to national needs, may be expected to lead to lower fertility rates.

As for population resettlement, I believe that compulsory resettlement should be ruled out as a development option. This is especially true in areas like Mola, Sinamusanga, and Simunchembu where people already have been forcibly relocated because of the construction of the Kariba Dam (and in the case of some of Mola's people subsequently regrouped during the war).

Educated, highly mobile people are largely unaware of the extreme multidimensional stress that is associated with the forced relocation of rural communities with strong economic, social, religious, and emotional ties to their land and homes. To date well over fifty studies have been carried out on low-income rural communities who have been forcibly resettled in connection with development projects around the world. Without exception, these studies (which include the Kariba relocatees) show the majority of the people to be worse off during a transition period following removal which rarely is less than two years in duration and may last for an entire generation.<sup>2</sup> During this transition period rates of illness and death frequently increase,

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<sup>2</sup>See especially Colson, Elizabeth The Social Consequences of Resettlement, Manchester University Press, 1971 and Hansen, Art and Anthony Oliver-Smith, editors, Involuntary Migration and Resettlement: the Problems and Responses of Dislocated People, Boulder: Westview Press (USA), 1981.

especially among children and the elderly. Elderly men and women of all ages are apt to suffer profound psychological stress while economic and social life suffers through the loss of a range of productive and socially important activities. A further result of forced relocation is frequently an extreme form of dependency relationship on the part of a people who did not wish to move and — in the Kariba case — who have not benefitted directly from the electricity which was the major economic reason for dam construction.

Though I do not see compulsory resettlement as a viable development option, there would appear to be ample scope for a voluntary community settlement program using, for example, extensive areas of undeveloped land between the Sanyati Gorge and Kariba Township and along the Zambezi River itself between the lower end of Kariba Gorge and the Chirundu Sugar estates. Such areas might be set aside as Northern Sebungwe settlement areas under the Ministry of Lands, Resettlement and Rural Development, a possibility which will be discussed in more detail in Section V-C of this report.

#### C. Natural Resources

One of the strong points of the Sebungwe planning effort to date has been to focus attention on the region's natural resources as a local, national, and international asset of major potential. This applies not just to wildlife, but also to the fishery stocks of Lake Kariba, the lake drawdown areas (with their extensive grasscover of Panicum repens), and to the mineral resources of the area. There is no doubt that these resources are a major local and national asset which require careful management. There is also no doubt that the area's wildlife is under increasing pressure from an expanding human population throughout the Sebungwe region, while certain areas along the lake are being overfished by gillnet fisherman. While the development options that are discussed in this report are those that attempt to reconcile natural resource interests with the interests of the human population of the area, a basic assumption of this report is that people come first and that the majority of Northern Sebungwe's inhabitants must continue to support themselves on the basis of agriculture -- meaning here a diversified farming system involving crop agriculture, livestock, and off-farm employment. If such support is not available, then pressure on park and wildlife management areas will increase through time as hungry and unemployed people use up the last resources available to them.

#### D. Summary Statement

To resolve conflicts between an increasing human population and Sebungwe's rich game and natural resources will not be an easy task. But it is possible provided the various government departments

involved are willing to compromise in the interests of regional planning and integrated development. National park boundaries, for example, will have to be carefully scrutinized and in some cases redrawn so as to create buffer zones between parkland and cultivation areas; longstanding tsetse control policies such as game fences and hunting will have to be altered; the prohibition on village agriculture along the lakeshore margin will have to be lifted in certain carefully selected areas, with the draw-down area between high and low reservoir levels utilized for recessional cultivation and for grazing by domestic animals rather than game; and portions of safari areas may have to be opened up for human settlement with other safari areas handed over to district council management. Some settlement schemes for the people of Northern Sebungwe may also be desirable, although all resettlement should be on a voluntary as opposed to compulsory basis. In all these regards the various participants in Sebungwe's development will be required to compromise, for if present trends continue not only will game populations be gradually destroyed but the people's living standards will deteriorate still further.

#### IV. THE TONGA-SPEAKING PEOPLE OF THE MIDDLE ZAMBEZI VALLEY

##### A. The People as Farmers

According to government tax lists and tour reports, at least 80,000 people lived in the Middle Zambezi Valley just prior to the construction of the Kariba Dam Scheme. The majority of these lived in Zambia, where 36,000 were relocated in the late 1950s versus 21,000 in Zimbabwe. Because of the negative impacts of resettlement and the war on the people, it is difficult to estimate the current population of the Northern Sebungwe. Current population estimates for Binga District range from 90,000 to 107,000, the majority of whom would be Tonga-speakers. Estimates for Omay Communal Area range from 9,000 to 14,000, perhaps half of whom are Tonga-speakers. In Gokwe district the only resettled Tonga chief is Simunchembu, whose people may number 4,000. But there are an unknown number of other Tonga-speakers in the District, so that their total in the Sebungwe Region probably lies between 70,000 and 100,000 people today. Though that is still a minority of people within the region (the large majority being Shona-speakers), the Tonga form the large majority of those impinging on the National Parks and Safari Areas within the Sebungwe. With a few exceptions, they also live in those communal areas with the largest existing wildlife populations. For this reason any development plans which attempt to maintain wildlife populations must take into consideration the needs of the people and their way of life. They must also provide employment opportunities for at least 35,000 men and women over the age of seventeen.

The Tonga prefer a diversified farming system to one based on a single crop. Prior to their relocation, the majority of the people

lived close to the Zambezi river and the lower reaches of the Zambezi's major tributaries where numbers of people were determined by the distribution and extent of the more fertile alluvial soils. To spread risks (arising from irregular rainfall, floods and pest damage) a variety of crops were cultivated in different garden types, with the most valuable gardens being cultivated twice annually. These were mukuti gardens on Acacia albida flood plains which were cultivated both during the rains and after the recession of the annual Zambezi flood. River bank gardens (zilili or jelele) were also cultivated during the dry season as tributary and Zambezi water levels receded. Crops grown included bulrush millet, several varieties of sorghum, early maturing (kaile) maize, cucurbits, legumes, turkish tobacco, and hemp (lubanje).

In the late 1930s the famous agricultural ecologist Trapnell and his colleague, Clothier, described Valley Tonga agriculture as "a relatively advanced system of semi-permanent cultivation of bulrush millet and kaffir corn, which are planted with the hoe principally on sandy alluvia Thorn soils adjoining the rivers" (1937:54). At that time semi-permanent systems of cultivation were comparatively rare in Central Africa. Still rarer were systems based on the twice-annual permanent cultivation of Acacia albida lower alluvial terraces. The Valley Tonga practiced both forms of agriculture. The point is an important one granted the frequency with which otherwise knowledgeable people refer to the people as not being farmers. There is even a statement in the 1980 report of the Sebungwe Regional Study about the Tonga not being agriculturalists. As well as being wrong, this impression has dangerous development implications since it tends to downgrade the potential for agricultural development in the northern portion of the Sebungwe.

Kariba resettlement is partially responsible for this erroneous impression, since it replaced a relatively intensive system of agriculture (making use of natural recession cultivation) with a more extensive bush fallow system on less arable lands -- as in the case of Chief Mola, for example. The simpler systems of farming seen today, with fewer garden types and fewer crops (with the loss of early maturing maize varieties being a serious one), are a product of Kariba resettlement to less favourable areas. It does not represent evidence of a lack of interest or competence in agriculture on the part of the people. In Zambia, the Plateau Tonga (most of whom emigrated to the Plateau from the Middle Zambezi Valley) are considered to be one of the most progressive farming populations in Africa, especially in regard to their system of mixed farming.

Except where precluded by bovine trypanosomiasis, throughout the Middle Zambezi Valley Tonga agriculturalists prefer to combine livestock with crop agriculture. Across Lake Kariba in Zambia, hoe cultivation is a technique used by only a small minority of farmers. The rest plough with oxen, cultivating food crops, tobacco, cotton and

sunflowers. Indeed, Buleya-Malima in Chief Sinazongwe's area is considered the "cotton basket" of Zambia. There is every reason to expect that the Valley Tonga in Sebungwe Region could advance equally rapidly as farmers if they had access to equally fertile soils and if they had similar opportunities.

As for the off-farm component of the farming system, historically that has included unskilled wage labour. The prevailing pattern has been for younger men to leave the Valley for outside employment towards the end of the main cultivation season, returning just prior to the rains some six months later-- although in less fertile areas or in areas where family land resources were more restricted labour migrants were apt to be absent for several years at a time. Money remitted home enabled the family to buy meal in times of need. More recently, as educational levels and incomes have increased, as is the case in Zambia, young men and women tend to invest their savings in rural areas by purchasing cattle which are kept with, and used by, their village relatives. Little such investment is currently possible in Northern Sebungwe simply because few people have had access to the necessary education and training to raise their salaries above the subsistence level. The situation has become especially serious in recent years because of the difficulty of finding any kind of employment either within or without Sebungwe.

#### B. Common Misperceptions Regarding the Tonga

During both field visits to Sebungwe, I was constantly informed by those familiar with the Tonga, that somehow they were less motivated, less agriculturally inclined and even less intelligent than other Zimbabweans. Even one Tonga school boy subscribed to this view, stating his people were just plain lazy. Not only is this view erroneous but it also serves as a justification for "teaching" the Tonga what is right in ways that amount to a form of exploitation since it condones the use of land and other resources by outsiders at the expense of local utilization of those same resources.

Granted the strength of the opinions of those who believe that the Tonga are less motivated (and when employed, less hard-working and less reliable than other people), it is important to look into the recent history of the people of the northern Sebungwe so as to better understand lack of motivation and reliability in areas where it actually occurs. Geographically they are among the most isolated people in Zimbabwe, their Valley habitat being cut off from the Plateau by a rugged, unpopulated belt of escarpment country. From the Zambezi Valley to Gokwe (the southern gateway to the Valley) was over twice the distance that separated the Zambian Valley Tonga from the adjacent Plateau before Kariba. Furthermore, in Zambia the peoples' neighbours on the Plateau were also Tonga who lived close to European commercial farmers along the line of rail and who became commercial farmers in

their own right as time went on (today one of the most successful small scale settlement schemes in the tropics is Family Farms Inc., in Zambia, where Tonga farm commercially with oxen).

Another historical factor of some importance may be the Zimbabwean Tonga's position as a very small minority whereas in Zambia they belong to one of the two largest linguistic communities (the other being Bemba-speakers). Before Kariba, the Zambezi may have been the boundary between Northern and Southern Rhodesia but it was not a barrier between the north and south bank residents. On the contrary, when I lived in the Valley in 1956-57 I found people constantly visiting back and forth across the river -- poling themselves across in a few minutes in dugouts made locally from Acacia albida. Not only did intermarriage occur frequently, but people attended funerals on both sides of the river. In the Zambian village where I lived, the people had actually come from Zimbabwe, especially from the chieftaincies of Sinakatenge, Mola, and Simunchembu. Some of those who came from Sinakatenge still cultivated gardens there, poling across the Zambezi daily. I went with them, and found life little different in Sinakatenge's area from that in Chipepo.

Kariba changed all this, separating the people from their relatives by a large reservoir and effectively cutting the Zimbabwean Tonga off from Zambian schools, clinics, and stores that they used to utilize in the 1950s. Kariba resettlement not only isolated the people, but it also forced them to leave their preferred homes along the Zambezi. And it showed that they and their leaders were powerless to protect their most vital interests. A major risk of compulsory relocation is that it creates dependency and apathy among those involved who believe that they have lost control over their futures. In most cases these effects tend to lessen after a few years. Such does not seem to have been the case among many of the Sebungwe people who were moved in the 1950s.

Since dependency along with lack of motivation is also said to characterize people in areas like Siabuwa which were not relocated because of Kariba, clearly other factors must be involved. Of these I believe the most important is the lack of opportunity available to the people of Northern Sebungwe in comparison with other parts of Zimbabwe -- especially with the Tonga-speaking areas in the Zambian portion of the Valley. Touring through the Northern Sebungwe in 1963 reminded me of the more remote parts of Zambia's Middle Valley in the late 1950s -- a development gap of some 8-10 years. By 1982 the gap had widened appreciably to some 15-20 years, the Northern Sebungwe then reminding me of the Zambian portion of the Valley in the early 1960s.

In Zambia, resettlement was accompanied by a major program to control tsetse fly. While cattle had been present in Mwemba Chieftaincy since the turn of the century, elsewhere bovine trypanosomiasis had excluded both cattle and ox traction. Such was

no longer the case by the late 1960s when most relocatees were using ox traction. It is indisputable that the switch from hoe to ox cultivation in Central Africa increases the productivity, living standards and wealth of those involved. In the Middle Zambezi Valley, I estimate that ox traction alone enables the farm family to double the acreage cultivated without a major increase in labour demands. Indeed, it reduces labour demands associated with initial weeding, and extends the planting season since land preparation for planting and first cultivation are combined in a single operation. Subsequent labour demands for weeding are also reduced once the farmers learn how to cultivate with a plough or cultivator. And though labour demands at harvest time go up with ox traction simply because a wider area is farmed, transport to village granaries is made easier through the use of sledges and ox carts. Granted the above, the continued presence of tsetse throughout most of the Northern Sebungwe region has placed the people at a tremendous disadvantage. Indeed, severe tsetse infestation has adversely affected the production of sheep and goats, and even dogs, as well.

In Zambia resettlement was also accompanied by a major educational program, with the first secondary school for Valley inhabitants established in 1962. By 1972, the Valley had produced well over 500 secondary school leavers, whereas today the number exceeds several thousand with practically every village -- if not every village -- having at least one (and not infrequently over ten) secondary school graduate with a Form III or Form V qualification. Today in Sebungwe the number of such graduates is less than 100. This low level of education places the Tonga-speakers at a major disadvantage in comparison to other Zimbabweans. Among Zambian Valley Tonga Secondary graduates, there are now Ph.D.'s (including the Dean of Natural Sciences at the University of Zambia), a fair number of doctors, one government minister, a member of the Central Committee of the United National Independence Party, and literally hundreds of trained teachers, clerks, etc. There is practically no branch of government service in which Valley Tonga are not represented, including the Air Force, the Valley having probably produced more jet pilots than any other district in Zambia proportionate to its numbers. In Zimbabwe the situation is radically different; there are few Tonga-speaking teachers, and even fewer trained medical personnel. Furthermore, Form II graduates from the Valley still find themselves at a disadvantage since increasingly entrance into teaching, agriculture, and other departments requires "O" level standing.

Though other examples could be given illustrating the opportunity gap that has opened between the Valley Tonga of Zambia and Zimbabwe, cattle ownership and education are especially significant. Clearly, agricultural development in the Valley requires tsetse control and the introduction of draft animals. To follow any other course will continue to subject

thousands of people to low productivity associated with backbreaking labour requirements, especially in regard to land preparation, timely (early) planting and weeding. Though tractors may be a partial solution for some, their operation, maintenance and cost present major problems in an area so isolated from commercial centres as the Middle Zambezi Valley. There is clearly also an urgent need for a major education and training programme for the people of Northern Sebungwe (a programme stressing a wide range of subjects including agriculture and technical training) if they are to realise the same potential there as they have already shown in Zambia.

The people in the Zambian portion of the Middle Zambezi Valley have moved quickly to take advantage of opportunities available to them. In the early 1960s, men learned how to fish commercially with gill nets, the development of the local fishery being greatly assisted by the ready availability of credit for buying nets and improved boats, and by courses offered at the Sinazongwe Fishery Training Centre. Profits were high, with most fishermen investing in cattle and in the education of their children and with a minority investing in village stores and other industries. Today the largest single source of capital for the stores that are still operating within Zambia's Gwembe District continues to be fishing, which also supplied the nucleus for the current herds of cattle that graze the shoreline of Lake Kariba. Using cattle, the majority of the people shifted from hoe cultivation to ox traction, as already mentioned. They experimented with various crops, including early maturing dwarf (red flammida) sorghum, becoming during the 1970s major producers of cotton and sunflowers. With people responding rapidly to price incentives and new opportunities, the major constraints to further development in the Zambian portion of the Middle Zambezi Valley relate not to the abilities of the people but to adverse rural/urban terms of trade -- including low producer prices, and inadequate social and physical infrastructure.

I have emphasized the Zambian situation in some detail because I am convinced that the potential of the people of Northern Sebungwe is equally high, provided sufficient incentives and opportunities are provided. This is not to suggest that development will be easy or rapid -- the northern portion of the Sebungwe Region has been neglected for too long for that to occur. Forced resettlement, hardship, and neglect over a twenty-five year period clearly have taken their toll. But the fact remains that the prime resource of the Northern Sebungwe are its people and they should be the primary focus of future development programmes. This does not mean that the importance of wildlife should be de-emphasized but rather that far more attention should be paid to the people of the area and to agricultural development which must continue to be the basis of the economy for years to come.

## V. DEVELOPMENT OPTIONS

### A. The Primacy of Agriculture

The experience in the Zambian portion of the Middle Zambezi Valley reinforces the conclusion that agricultural development within the Northern Sebungwe is the only mode of production which can support the increasing population at a reasonable standard of living. Certainly this is true across Lake Kariba in spite of a major coal mining complex at Maamba. A major weakness of the Sebungwe regional planning effort to date is that no attempt has been made to estimate how many people might be employed in the various forms of development suggested by the planners -- and, of that number, what proportion can reasonably be expected to come from Northern Sebungwe. The various options embrace agriculture (including land settlement), fisheries, natural resource management (including game utilization, forestry and tourism), mining, and government and private employment within and without the area.

If compulsory resettlement is rejected as a development option as it should be and areas for voluntary settlement are available, the people are likely to prefer voluntary settlement areas that are already familiar to them -- which means settlement schemes within the Middle Zambezi Valley. As for employment without the area, the people are at a major disadvantage in comparison with other Zimbabweans because of their lower levels of skills and of education. Even if they are given preference for employment within parts of the Sebungwe, their low skill and educational level will place them at a disadvantage in regard to many jobs. Though Zambia's Maamba mining complex employs over 1,000 people, less than 200 of these are from the Valley. There are two reasons for this situation. First, Maamba is a national project which means that people are recruited according to their job qualifications rather than their area of origin. Second, when the mines started up in the late 1960s local residents did not have the necessary skills and education -- so that even if they had been given preference, people from other areas would have been recruited, as they were. Should Rio Tinto start operations on the Middle Sengwa within the next ten years, they will need a skilled labour force (today at Maamba only Form V leavers are recruited for the large majority of jobs). Unless a major training programme starts within the next few years, mining development within the Sebungwe cannot be expected to employ large numbers of local people. Most likely the same will apply to the informal employment sector that builds up around the mines, which includes artisans, traders, shop keepers and others who serve the needs of the labour force. Within the Northern Sebungwe only a minority of the stores are locally owned. Similarly, many traders within the area are outsiders, simply because the local people do not have either the capital or the skills to enter non-agricultural

enterprises. Though they form the majority of those working for kapenta fishermen, even here the Europeans involved at least initially tended to bring in employees from their home areas. As a result, the main employment for local people is largely as unskilled labourers whose employment is unlikely to allow them to set aside sufficient savings to facilitate other types of development.

Regardless of how one examines the situation, there is no other occupation than agriculture which can be expected to employ the large majority of people during the coming years. Granted that the people already are farmers, agricultural development must have primacy in any development programme for the Sebungwe Region. This means that areas with the highest agricultural potential must be developed for agriculture. Since cattle are associated with higher productivity and living standards, it also means that their introduction is necessary. While agricultural development obviously poses major threats to wildlife within the Sebungwe, there is no doubt in my mind that the threat to wildlife in the long run is still greater without agricultural development since only that can employ the numbers of people within the area at a reasonable standard of living.<sup>3</sup> With proper planning, and implementation, accompanied by an educational programme within the schools and villages (in the latter case eventually carried out through the District Councils), it should be possible to eliminate the major conflicts.

Before discussing specific development possibilities, it is necessary to examine the potential of the northern portion of the Sebungwe Region for agriculture. In various publications on the Middle Zambezi Valley, the agricultural potential of the area is frequently considered to be low which is one reason why large portions of the area have been set aside for wildlife management, recreation, and tourism. Hence in the 1950s some thousands of people were compulsorily removed from the Zambezi Valley below Chirundu in order to establish Mana Pools and various Safari Areas. Similarly Kariba's lake shore margin was closed to local settlement except under carefully controlled conditions — the main form of settlement being fish camps in which the occupants were not allowed to practice agriculture.

There are a number of reasons for this assumption of the Middle Zambezi Valley being an area of low agricultural potential. One relates to a low and extremely irregular rainfall pattern which is considered to be unsuitable for dry land farming. Another

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<sup>3</sup>Because of crop failures in the past, the people of Sebungwe have become experts second to none in living off the wild food plants and game of the bush. Without agricultural development, they may well deplete these resources by the end of this century.

relates to the commonly held belief that different types of mopane soils have low inherent fertility. While it is true that Valley rainfall is low and extremely irregular by Zimbabwe standards, and that some mopane soils have virtually no agricultural potential, it is not true that The Middle Zambezi Valley as a whole has low agricultural potential. Indeed parts of the Valley have a high potential for certain crops and for livestock.

## 1. Soils

Though detailed soil surveys are essential before new areas within the Valley are opened up for cultivation, and before intensification occurs in old lands, certain Valley soils produce adequate crops year after year, even during most periods of irregular rainfall. These soils are quite easily identified by their associated vegetation. They include alluvial and colluvial soils along the major water courses which support Acacia albida (on lower terraces) and Acacia tortilis (on upper terraces) - other species woodland. They also include a variety of mudstone soils of Karoo origin under good stands of mopane. Properly managed, sandy loams of Karoo derivation which support londe (jessie) and other types of thicket growth also have agricultural potential. Taken together, the above vegetation types which overlie favourable soils cover a significant portion of the Middle Zambezi Valley.

## 2. Past, Present, and Future Farming Systems

The people of the Middle Zambezi Valley have farmed Acacia and mopane woodland areas and londe and other thickets for centuries, using vegetation indicators to select the better soils. The better alluvial soils they farmed twice annually in the past without causing serious land degradation. The upper alluvial terraces and better mopane soils supported semi-permanent cultivation during the rainy season, with perhaps five years of farming followed by an equal period of fallowing before the land was recultivated. Cultivation periods were shorter and periods of fallow longer on sandy loams. So long as periods of cultivation were followed by sufficiently long fallows, degradation on these soils also was kept under control. More recently, immigrant farmers into the upper portion of Gokwe district have developed a four-to-five-year crop rotation system which allows them to cultivate the better mopane soils on a nearly permanent basis. Having found acacia riverine areas already fully utilized, they pioneered the inland mopane areas.

Looking to the future, three areas would appear to have considerable agricultural potential. These are alluvial soils along such major tributaries as the Lubu and Sengwa Rivers; the better

mopane soils backing up such tributaries and various Madumabisa shales; and the drawdown area between the high and low water levels of Lake Kariba.

a. Tributary Alluvia

With proper development, through both dry land farming and irrigation, carefully selected tributary alluvia should be able to support a denser population of both people and livestock at a higher standard of living. Small and medium scale irrigation would be greatly facilitated by the construction of a series of small dams along the upper reaches of such tributaries at the Mtshezu (a tributary of the Sebungwe) and the Mucheni -- both of which rise within the Chizarira National Park. There are many small-scale dam sites throughout the Sebungwe region which could be used to increase agricultural production. There is also considerable potential for many small subsurface dams associated with manually operated pumps like the Bumi Pump, which can irrigate somewhat in excess of one hectare.

b. The Better Mopane Soils and Madumabisa Shales

With proper management, mopane soils backing up the major tributaries can support improved dry land farming systems as well as irrigated farming. Though further experimentation is needed, there seems to be considerable dry land farming potential for a four-to-five year rotation involving such crops as early maturing maize, cotton sorghum, and legumes. In Zambia irrigated mopane soils at Siatwinda produce excellent quality rice during the rains, under conditions which favour using such areas for seed multiplication to meet national needs. Within the Sebungwe region the mudstone soils of the Chidaga to the east of the Middle Sengwa would appear to have considerable agricultural potential. Currently virtually unutilized, they have little value as a wildlife habitat.

c. The Lake Kariba Drawdown Area

Drawdown or recessional cultivation is an ancient form of natural irrigation utilized in many river valleys and lake basins throughout Africa and the Middle East. Before Kariba it was practiced in appropriate locales throughout the Middle Zambezi Valley. Cultivation started after the annual flood of the Zambezi began to recede in March-April with the people planting maize, beans, cucurbits and turkish tobacco in the moist alluvia as the flood waters receded. Planting continued until September, by which time crops on the upper flood levels were being harvested. Those along the lower margin of the river's drawdown area were harvested in November-December just before water levels began to rise with the commencement of the rainy season. In other words, crops were harvested over a six month period, this being a major advantage of this type of agriculture which is labour intensive while requiring little capital.

Immediately after the formation of Lake Kariba, the people attempted to cultivate the reservoir's drawdown area in Zambia. Initial yields were excellent, with one agricultural officer reporting "some of the best maize ever reaped in the Valley." This was in 1964 just after the reservoir had filled. For several years thereafter, however, drawdown was extremely irregular, occurring at different times from one year to the next. As a result, drawdown cultivation ceased. Now, however, the drawdown has become regularized, with lake levels beginning to fall no later than June-July and continuing to drop, with a very low probability of intervening fluctuations, until December-January — providing a five-to-six-month cultivation period within the upper portion of the drawdown area.

Colonized since the mid-1960s by Panicum repens, drawdown areas have high potential for livestock production. Especially on mopane soils, they also have high potential for crop agriculture. As water levels drop, maize, okra, turkish tobacco, legumes, vegetables, and fodder crops (especially for seed multiplication) can be grown. Bulrush millet and sorghum may also be possible crops, especially if sorghum is transplanted as along the Niger River (in the Northern Sebungwe, farmers already know how to transplant sorghum grown during the rains). As the water levels rise during the rainy season, there is also a potential for growing floating rice -- though research is needed to see which varieties can best cope with an initial rise in water levels which can amount to a metre within a single month. Recessional cultivation is currently practiced by a small number of farmers on both sides of Lake Kariba. The potential is such that the Food and Agriculture Organization of the UN, collaborating with Zambia's National Irrigation Research Station, is currently establishing a pilot project within the drawdown area at Chiabi between Chipepo Harbour and Sinazongwe. Though there is much more scope for drawdown cultivation along the Zambian shore of Lake Kariba than along the Zimbabwean shore (where, for geological reasons, suitable areas are limited between the Sengwa and Sebungwe Rivers along the upper sections of the lake), nonetheless several thousand people could probably be supported by drawdown cultivation supplemented by some dryland farming between Kariba Township and the Sanyati Gorge. Should settlement schemes be established in this area, it might be possible to encourage a number of Chiefs to move their people into this zone from such areas as Mola and Sinamusanga where existing lands are over-utilized.

In summary, if farming systems involving crop agriculture, livestock management, and such off farm employment as fishing and wage employment are developed in the type of areas briefly described above, it should be possible to take the pressure off the most valuable National Parks and Safari Areas within the Sebungwe Region (some examples of how this might be done will be considered briefly in the sections that follow). Though the Northern Sebungwe Region does pose many constraints to agricultural development, the potential is there. Indeed, because of its hot dry conditions, the Middle Zambezi Valley is

able to supply a range of fruits and vegetables to the colder plateaus of Zambia and Zimbabwe at least a month before such crops come into season elsewhere. Provided marketing systems are developed, this fact alone gives the Zambezi Valley a comparative advantage which justifies exploitation. There are also a range of crops including rice and Stylosanthes and other fodder crops which might be best multiplied in the Middle Zambezi Valley in terms of quality of seed. Here relatively small holdings would provide a good income for those farmers involved.

## B. Suggestions for Developing a Diversified Production System for the Inhabitants of the Northern Portion of the Sebungwe Region

### 1. Introduction

This section deals with a wide range of development possibilities for the northern portion of the Sebungwe Region. Though I believe each has considerable potential to employ people and to raise living standards, they are presented not as recommendations but rather as illustrations of what should be possible. If the Sebungwe Region is to develop and conflicts reduced between people and game, a wide range of such options must be selected, initiated on a pilot basis, and then replicated on a wider scale if initial results are encouraging. But that alone is not sufficient. Though each option is discussed as if it was a separate entity, in fact a range of options must be integrated into a diversified production system at all levels from the household up to the region.

The order in which different options are discussed is not intended to indicate priorities. These will have to be established through experimentation and demonstration. Furthermore, they can be expected to differ from one area to another, and to vary through time in any given area. Other options could just as well have been included. The ones that follow are selected to indicate the range of development possibilities that exist. They also emphasize options with which the Valley people already have some familiarity. And they include options which have already shown potential within some portion of the Middle Zambezi Valley.

### 2. The Need for a Diversified Production System

As used in this report, the word diversification has two meanings. One relates to a diversified economy for the region which includes a wide range of occupations including agriculture, fishing, wildlife management and tourism, mining, and government and other employment (including self-employment). The other meaning of diversification refers to the production or economic system at the family or household level (the household here meaning those who live,

eat, and work together as a production unit). As a risk reduction technique, the production systems of the Valley peoples have always been diversified at the household level — with each household head trying to gain access to a variety of garden types (in which a wide range of crops are interplanted) and several species of livestock, with farming activities supplemented by the wage labour of family members employed outside the village. One problem resulting from Kariba resettlement has been a reduction of the complexity of the farming systems of the Valley peoples — with a relatively intensive system of semi-permanent cultivation of a wide range of crops replaced in many areas by a more extensive system of bush fallow cultivation based on fewer crops. If future development is to be successful, agriculture need be intensified and diversified at the household level and supplemented by a wider range of off-farm activities including arts and crafts, village industries (brickmaking, building, bakeries, and so on), and employment. The logical starting point is the current farming systems of the Valley peoples.

### 3. Cereal Development

The incorporation of early maturing varieties of maize, of early maturing brewing sorghums (called Red Swazi or chibuku in Zimbabwe and red fammadia and chigaligali in Zambia), and of rice within the local farming systems would be a major step toward reducing food shortages within the area. Though the Valley peoples used to grow early maturing flint maize (called kaile) along the Zambezi which played an important role in alleviating hunger in the past since it could mature in less than 80 days, this is no longer grown in at least some of the inland resettlement areas. This is most unfortunate since there is a great need for a more productive early maturing variety of maize for the Sebungwe Region. In Zambia, none of the hybrids currently distributed to farmers (including SR 52) are suitable for the Middle Zambezi Valley. The same may well be true in Zimbabwe. Yet suitable varieties exist and others can be developed. A case in point is Pioneer, a South African variety, which produced quite well during the 1981-82 season in those limited areas of Zambia where it was available while SR 52 planted in adjacent fields failed.

Brewing sorghums tend to mature in March within the Middle Zambezi Valley as opposed to April-May for the giant sorghums which are currently grown. They too did quite well during the 1981/82 season in spite of this being one of the least favourable since Kariba's construction. Unlike giant sorghums, Red Swazi can be sold as a cash crop to the Grain Marketing Board. Though it has relatively poor storage capacities and is not a preferred food, it can be eaten if other cereals fail. And it can be converted to village beer which can be sold at a high profit margin if its quality is good. Visitors to the Valley are frequently puzzled to see village women in hunger years converting famine relief meal to beer. Actually this makes sense since

a good batch of village beer can be sold at twice the cost of the necessary inputs. The proceeds from such sales can then be used not only to purchase more meal but also to finance the educational costs of students currently enrolled in secondary school. In redistributing income from men to women, the village brewing industry tends to keep capital within the community while the construction of private bottle shops and beer halls siphons capital out of the area.

High quality rice has been successfully grown on mopane soils across Lake Kariba on the Siatwinda irrigation scheme. It might well prove to be an important crop for small scale irrigation schemes based on gravity flow from tributary dams or hand pumping from river beds and pans during the rainy season. At Siatwinda, local farmers now consume rice as a cereal staple, suggesting that rice has importance for both local consumption and export. As reservoir levels go up, floating rice may also be a suitable crop for planting within the Lake Kariba drawdown area, although here considerable experimentation with West African and other varieties is needed before villagers are encouraged to try this crop.

#### 4. Turkish Tobacco

Along with hemp (lubanje), Turkish tobacco was the major cash crop within the Middle Zambezi Valley before Kariba. Although it has received very little attention from agricultural researchers, it is still a preferred cash crop in the Zambian portion of the Middle Zambezi Valley. Planted in March if rainfall is adequate, Turkish tobacco is processed into cones (weighing approximately one kilo each) which are sold along the line of rail at a sizeable profit, one cone bringing in over \$10 Zimbabwean. Demand continues to exceed supply. Whether there is a similar demand in the low income townships of Zimbabwe (including those at Kamativi, Wankie, and Bulawayo) would have to be established by an approximate marketing survey. During our recent tour, Blackie and I found some turkish tobacco being grown in every chief's area visited. Most was said to be consumed locally, though some was sold around Gokwe (where presumably the market is saturated) for approximately \$2 per cone.

#### 5. Cotton

Cotton grows very well in the Zambian portion of the Valley, where villagers regularly harvest grade 1 quality. In recent years villagers in the northern portion of Sebungwe have also begun to grow cotton. It has been grown for two years, for example, in Simunchembu's area (Gokwe District) and was first grown in Mola's and Nebiri's area (Kariba District) during the current season. On the other hand, cotton cultivation has yet to be introduced in the Chunga Valley area of Binga Chieftaincy although it is grown over the hills in Siabuwa. Labour

intensive, cotton is a valuable source of household income at present producer prices. The major risk is that its cultivation will increase at the expense of cereal cultivation. This has occurred in parts of Zambia and may well be associated with a recent rise in malnutrition. This is one reason why agricultural development should focus more on a viable farming system for the Valley people as opposed to placing too much emphasis on single crops. Where cotton is grown, cereal crops should also be stressed. One way this can be accomplished is through a four-year crop rotation system which involves two cereal crops (an early maturing maize and a dwarf sorghum), cotton, and a legume.

## 6. Other Crops

Many other crops have been suggested which are suitable under Valley conditions. Some have a comparative advantage in that they ripen earlier than the same crops on the Plateau. However, these tend to be fruits and vegetables which present major marketing problems which have yet to be solved anywhere within the Middle Zambezi Valley with the exception of bananas which are profitably grown at Chirundu in Zambia and marketed some 100 miles north in Lusaka. Valley bananas are of high quality. So too are Valley pawpaws and Valley citrus, especially pink grapefruit. As for vegetables, many types can be grown along the Lake Kariba foreshore except during the months of January-February, though local markets are easily saturated while access to more distant markets presents formidable problems. On the other hand, the recent rapid increase in small fenced, dry season vegetable gardens along water courses and the edges of moist depressions should be encouraged both as a source of badly needed food in the villagers' diet and as a source of vegetables for local institutions such as schools, hospitals and government departments. The speed with which such gardens have been developed within a chiefs' areas visited shows the ability of the Valley people within the Sebungwe to adopt new production techniques. Some of the village gardens inspected were of a very high standard. Carefully fenced, they were handwatered with ashes used to reduce insect damage. In some cases goat manure (and in one case elephant dung) was used for fertilizer, while along the Kariba foreshore mulch made of decaying Salvinia was utilized.

Other crop possibilities include cashew nuts (which have been shown to grow well in the Binga District), botanicals, and various leguminous fodder crops like Stylosantes. Seed multiplication may well be possible in the latter case, providing a high value cash crop. Though harvesting is labour intensive, the Valley people are accustomed to harvest the minute seeds of a variety of wild grasses during hunger years, an ability which could be adapted to the harvest of other types of seeds, especially if they have a high cash value. As for botanicals, they include a number of wild plants like Rosette (Hibiscus sp.) which grow well in the Valley.

## 7. Goats

The Middle Zambezi Valley is a paradise for goats, with high reproduction rates increased by a significant proportion of multiple births. In Zambia, for example, over 50 percent of the goats in the Southern Region are within the Valley which covers only a relatively small portion of the region. Though outsiders tend to see goats as a threat to the habitat, research by Quartermain at the University of Zambia shows that Valley goats are relatively selective feeders. At the same time they are a major form of wealth for the Valley people which can be easily converted to cash to meet a wide range of needs.

With proper management, goats could become a major cash crop. In Zambia there is a high demand for goats on the Plateau, with a profit margin of at least 100 percent for the more astute goat traders. The key to the management of goats within the Lake Kariba basin is a well-thought out and implemented marketing system which enables Sebungwe goats to be regularly purchased and sold in the major urban and mining centres. Ideally the traders should be local people, who initially might book transport from the District Councils or other development-oriented agencies working within Sebungwe.

## 8. Cattle

It is unrealistic to expect the Valley people to remain indefinitely as hoe cultivators. The major constraint to cattle ownership to date has been bovine trypanosomiasis. Once this has been brought under control, historically the Valley people have begun to purchase cattle and ploughs without exception. This is a most desirable trend since it not only alleviates the drudgery associated with hoe cultivation but is a major means for increasing production and living standards. In Zambia's Valley areas, for example, ox traction enables the household to not only increase yields per hectare but to double the area under cultivation by the same labour force.

Since Zimbabwe's Independence, major tsetse control operations involving aerial and ground spraying have commenced. Since it is not an economic proposition to maintain a static line against tsetse encroachment, the policy is to drive the fly into Lake Kariba to create a fly free zone. That this is feasible is borne out by the Zambian experience which had brought tsetse fly populations under control by the early 1970s, the major threat of reinfestation coming not from Zambia but from Zimbabwe.

Against this background, Sebungwe planners should operate on the assumption that Sebungwe will become a relatively tsetse-free zone within the next ten years. Far from lamenting such a development, it should be seen as an opportunity if properly

managed. Not only will the introduction of cattle facilitate village development, but tsetse control throughout the Sebungwe will also eliminate the need for fencing and hunting operations by the Department of Tsetse Control. This, in turn, will facilitate the establishment of buffer zones between population centres and game concentrations. As with goats, proper management techniques will have to be worked out to minimize the danger of degradation caused by increasing herds of cattle. As sources of milk, meat, cash and oxen for traction, a rapid increase in cattle populations can be expected in all farming areas. This, I would maintain, is inevitable and to resist the trend is doomed to fail in the long run. Far better to accept the inevitable and attempt to manage it.

Initially it is unrealistic to expect the large majority of the Valley people to respond to schemes for selling their cattle. This is not because of any "cattle complex" which forms an impediment to sales but is simply due to the fact that each household needs a certain number of cattle (calculated at 18 to 24 beasts among Zambia's Tonga-speakers) and a certain herd structure to meet their economic needs for cows as producers of milk and of work oxen. Once those numbers are reached, then cattle, like goats, can also be expected to become a cash crop if pricing is favourable and marketing facilities exist.

To reduce the danger of increasing herds of cattle damaging the habitat, a multifaceted management strategy need be developed. Experience in the Zambian portion of the Middle Zambezi Valley (where cattle now exceed 50,000 in number) suggests that the following components are desirable:

a. Disease Control

This includes a reduction in high rates of calf mortality, the goal being to encourage the Valley people to keep smaller numbers of fitter cattle and to remove from the land the significant number of sick animals that are an environmental burden. Though Valley cattle are susceptible to a wide range of illnesses, it is important to note that there are no records of foot and mouth disease among Valley cattle in spite of the fact that cattle and buffalo have co-existed in parts of the Valley for at least 75 years.

b. Credit for the Purchase of Donkeys in Areas Still Lightly Infested with Tsetse or Recently Freed from Fly

Because they are cheaper to buy and easier to manage, it may be possible to slow down the buildup of cattle populations in areas like Simunchembu by helping the people buy donkeys for ploughing and haulage. Indeed some Simunchembu farmers are already using work donkeys in agriculture.

c. Credit for the Purchase of Oxen Trained to Plough

If farmers can purchase trained oxen to meet their farm needs, this too will slow down the increase of cattle in the area since unassisted Valley people prefer first to buy cows which in turn produce oxen (and more cows). On the other hand, credit programmes for work donkeys and oxen will not stop an eventual buildup in cattle numbers. But they may well delay such a buildup, hence providing valuable time for working out improved grazing techniques.

d. Improved Grazing and Supplemental Feeding

In the long run the ability of village cattle to coexist with available food supplies without degrading the habitat will depend on the development of carefully managed communal grazing (and brozing) areas and of supplemental feeding. While Valley farmers with cattle herd them rather carefully during the rainy season, after the harvest cattle are allowed to roam freely. Though initially they stick close to home, once the arable stubble has been consumed they begin to range widely in the bush and, as food resources decrease as the dry season progresses, they may be found feeding miles away. Such poor herding techniques not only put the cattle at risk from wild animals and thieves (especially when they stay out at night) and disease but also pose a serious threat to the environment.

There is a pressing need to work out now a more responsible system for cattle management throughout the Valley. This is especially the case in areas like Mola where Kariba resettlement created unnaturally high population densities in locations which the Valley people in the past would have colonized only as a last resort. The introduction of cattle into such areas will put still further pressure on the land unless improved management techniques are introduced from the start. These should include utilization of the Lake Kariba drawdown area in appropriate spots since Panicum repens has high value as grazing for cattle.

9. Small Dams for Small-Scale Irrigation and Water for People and Livestock

As already mentioned there are many sites throughout the Sebungwe Region for the construction of small dams for multipurpose use including the irrigation of several to a hundred hectares. According to Professor Bond such sites number in the hundreds, in which case they present a major virtually untapped development resource. There are also innumerable sites for the construction of subsurface dams where clean sands have approximately 30 percent porosity. In both cases, water for irrigation could be supplied either through the use of small manually operated pumps (such as the recently marketed Bumi pump) or through gravity flow to downstream

areas. Both pumps and canal systems should be of simple design so that they can be easily operated and maintained by the farmers themselves.

Though the Zambian experience is that 0.10 hectare per household planted in vegetables can provide enough income to meet household needs provided they can be marketed while 0.25 hectare can produce enough grain to feed the household, most households initially will probably wish to supplement small irrigated gardens with dryland farming. While this type of diversification makes sense under current conditions, in time irrigation might become the main basis of support for an increasing number of families, but only if a reliable marketing system and market outlets exist. Initially emphasis on perishables should be restricted to crops which can be consumed within the family, village, and the local area, with exports restricted to such non-perishables as okra, turkish tobacco, sugarbeans and other legumes, and cucurbits (since pumpkins, like okra, can be dried locally).

In the Zambian portion of the Middle Zambezi Valley, the Nkandabwe irrigation project (approximately 4 hectares) provides for 40 households a valuable source of vegetables and fruits for local consumption and sale. Producers are organized into a farmer's committee which, with assistance from the Gwembe South Development Project (staffed by local people, government officials on secondment, and overseas volunteers), is showing itself quite able to utilize the gravity flow system. Such farmers' organizations initially should be formed primarily as water users associations, with additional functions (like marketing, purchase of requisites, receipt of credit, etc) added only after the association has shown itself able to manage the irrigation system (including the allocation of water, system maintenance and repair, and resolution of most water conflicts). Similar small-scale irrigation systems are being planned and implemented by the District Agritex Officer in the northern portion of Sebungwe, including one on a tributary of the Chunga which is served by a small earth-filled dam. Another small-scale irrigation project is planned for Kariyangwe which will make use of manual pumping from a bore-hole. Though many of the soils within the Sebungwe are poor aquifers, further bore-holes have development implications in suitable areas. Even where water is too saline for human consumption (and even for irrigation), it can be used for watering livestock and for a range of domestic uses.

#### 10. Utilization of the Lake Kariba Drawdown Area

Through examination of aerial photographs, and Lake Kariba Charts, with ground survey verification, it would be easy to identify those drawdown areas with the greatest potential for human settlement. Though these are less extensive on the Zimbabwean shores of Lake Kariba, extensive areas are nonetheless available between the Sanyati

Gorge and Kariba Township. With proper development they might well support several thousand people on the basis of crop agriculture, livestock production, and fishing. As already mentioned, recessional cultivation is now feasible in appropriate drawdown areas between June-July and December-January. It may also be possible to plant floating rice within the drawdown area as the reservoir rises during the rains and the early portion of the dry season. Dryland farming and some irrigation is also possible in some areas above the high water level. As for livestock production, Panicum repens (the dominant grass within the drawdown areas) provides exceptional grazing for cattle. Fishing activities would include gill net and kapenta fishing. They also might include fish ponds and other forms of aquaculture, with small weirs placed across reservoir inlets, for example, which would be periodically flooded when the lake level rose.

#### 11. Medium and Large-Scale Irrigation

With the possible exception of Gatshe Gatshe, larger diesel fueled pumping projects should be approached with great caution at this stage in Sebungwe's development since similar projects in Zambia have yet to prove themselves economic. With the advent of rural electrification, the situation could change significantly.

#### 12. The Gill Net and Kapenta Fisheries

##### a. The Gill Net Fishery

On the northbank of Kariba, the gill net fishery in the early 1960s was the most important single source of capital for the purchase of cattle (which in turn were incorporated into a mixed farming system based on cereal cultivation and the cash cropping of cotton and sunflowers), the opening of village stores, and the financing of secondary school education. Currently the northbank fishery is depressed because of inadequate gear, the absence of a lake transport system, and overfishing due primarily to the illegal use of small mesh nets (which often are placed across tributaries during the spawning season, with fish beaten into nets at night by fisherman flaying the water with metal strips attached to their paddles which produces a gunshot-like sound).

In Zimbabwean waters the situation is better, although the profitability of the fishery for the fisherman is still reduced by a number of factors. Most important perhaps is the fact that fish camps are usually miles away from the villages where the fisherman and their families have their permanent homes and their gardens. Though wives frequently come to the fish camps during the dry season, during the rains they remain cultivating in the home villages. The result is that their husbands are apt to spend much of their time in the home villages

also, hence reducing fish landings during some of the best fishing months. If productivity is to be raised, I believe that an attempt should be made to allow some communities to establish permanent villages along the lake shore margin where they can combine recessional cultivation, dryland farming, livestock, and fishing. The logical area to initiate this approach would be Gatshe Gatshe as well as the foreshore between Charara and Gatshe Gatshe. Should the University of Zimbabwe become actively involved in formulating development strategies for Sebungwe, the Sinamwenda fish Camp near the Lake Kariba Research Station at Sinamwenda might also be used as a pilot scheme. Though soil surveys would be needed, the fishermen resident there believed thicket soils immediately behind the camp were sufficient in quality and extent to support the dryland farming activities of approximately 15 families. There is also some potential for limited recessional cultivation.

Though Irvin and Johnson supply its fishermen with boats and nets, a revolving credit fund for upgrading equipment in the other fishing camps (which constitute the large majority) is probably needed. If the Zambian experience has any relevance, outboat engines should not be provided on credit. This should be restricted to nets, accessories, and improved boats. As for water transport, Liebig's and Irvin and Johnson as competitors provide an effective transport system for fresh, iced fish as far up the lake as Sinamwenda. In time it might be possible to provide a similar system out of Binga for the upper portion of the lake.

The big question mark which hangs over the Kariba Lake gill net fishery, however, is the tonnage of fish that can be landed on an annual basis without depleting the fishery resource. Current estimates vary from 2,000 to 3,000 tons if the fishery is properly managed. While such landings could support a significant number of households, the whole fishery may be jeopardized by the gradual increase in the illegal techniques that are rapidly depressing the Zambian fishery and keeping it from playing a major role in development.

#### b. The Kapenta Fishery

Due to its rapid development during the past few years, the kapenta fishery has become a major employer of local people on both sides of Lake Kariba. None of these, however, actually own kapenta fishing rigs so that most of the income generated by the kapenta fishery leaves the area without having a major impact on local development. The situation is therefore rather similar to the generation of electricity at Kariba: the Middle Zambezi Valley provides resources which are exported from the area. This is hardly an equitable situation, so means for enabling the local people to participate more fully in the kapenta fishery are needed. Four possibilities come immediately to mind. These are:

(1) Allocating several licenses to the Nyaminyama and Binga District Councils so that they can use Operation Windfall and other funds (including international aid) to purchase and operate their own kapenta rigs. At least initially, competent outsiders would have to be hired to develop and manage each Council's operation -- though with a proper training programme in time Council personnel should be able to run the operation.

(2) Developing a small-scale kapenta fishery using smaller rigs and nets, and appropriate lamps, in the more protected areas close to the shore. While the type of small-scale kapenta operations currently involving peasant fisherman on Lake Tanganyika are not suitable for Kariba conditions (early experiments with paraffin lamps, for example, failed to attract kapenta to the surface in sufficient numbers), it may be possible to develop an equivalent technology which will allow local fishermen to own, operate, and profit from their own rigs.

(3) Developing incentive systems for locals employed as kapenta rig captains and crew which enable the better local fishermen to earn higher incomes. Such incentive systems have already been introduced by a number of operators on both sides of the lake. In their simplest form, captains and crew members are paid a fixed sum for every crate landed, with the more successful crews earning well over the \$105 minimum wage.

(4) Involving local people directly in the drying and marketing of kapenta. In Zambia, kapenta marketing is a highly profitable occupation for small-scale traders. The same could be the case in Zimbabwe. The major problem is that kapenta operators believe they need a guaranteed outlet for their catch, not being able to tolerate the uncertainty associated with selling kapenta to a large number of small traders. Another problem is that such traders tend not to be local people, most of whom have little trading experience. By the time the locals have acquired the necessary experience, they find it virtually impossible to enter the fish trade.

It should be possible to overcome both of these obstacles. For example, a pilot project could be launched with a single kapenta operator based in an isolated area like the Sengwa basin whereby a development agency working through the District Council, or local community, guarantees to buy fresh or dry a fixed proportion of the operator's daily catch throughout the year. That agency then markets the kapenta with the help of locally recruited staff who in time are trained to take over the operation. Such a system benefits not only the local people but also the kapenta operator. First, he no longer has to transport fish at considerable cost to Kariba town buyers since they are bought where landed. Second, if sold fresh he no longer has to dry his catch.

### 13. Game Management

Currently the Department of National Parks and Wildlife Management is involved in two very imaginative schemes to enable the local people to benefit from Sebungwe's wildlife. The first, called Operation Windfall, hands over to local district councils (as opposed to the central treasury) the income generated by culling elephant in adjacent national parks and safari areas. To date most of the culling has been in Binga and Gokwe districts, with approximately 1,200 elephants culled in Chizarira National Park and Chirisa Safari Area. Hundreds of thousands of dollars have been involved, although in the future smaller amounts will be paid out since culling the future annual increase will involve a much smaller number of animals. As for the second programme, that hands over to district councils the fees that safari operators are charged for their quotas of game which can be shot by client hunters. Ranging downward from \$2,000 for a bull elephant, these fees also total several hundred thousand dollars per year. Such hunting fees are a more reliable longterm source of income to district councils, provided the game populations are maintained.

Though the district councillors and council employees are made aware through these programmes of the profitability of game and the need to manage it on a longterm basis, this knowledge has yet to reach down to the village level. While educational programmes (using visual aids and other devices) in the schools and community centres are needed for both children and adults alike, there is also a need for each district council to utilize some of the funds in wards which are more adversely affected by game destruction in agricultural areas. In Simunchembu, for example, which projects as a salient between Chizarira National Park and the Chirisa Safari Area, everyone to whom we asked the question claimed that no game management funds had been spent on upgrading road and social infrastructure within the chieftaincy. Similar opinions were expressed in Mola in Kariba District and in the Chunga Valley area of Binga District. Though these opinions may well be wrong, the important point is that the people most directly involved do not see themselves as profiting from the animals in their midst. On the contrary, they see them as a hazard to their lives and fields which they would like to see eliminated. Clearly in addition to an education programme, the District Councils need to work out procedures that ensure that some wildlife funds are used for development purposes in the most directly affected wards and that the villagers within these wards are informed about the source of the funds.

Looking to the future, the Department of National Parks and Wildlife Management hopes to facilitate the development of a range of employment opportunities for local villagers. These would include meat processing stations run by local authorities on the boundaries of Safari Areas which would hire local people. They might also include a tannery so as to increase materials available for local craftsmen to

fashion into curios and a wide range of merchandise utilizing animal skins. According to the 1980 Sebungwe Regional Study, "sales outside the Sebungwe of ivory, hides, and other trophies would at first be handled by the District Administration and Wildlife Department Staff, but would, eventually, be turned over to the people when they have gained the necessary expertise, especially in the management field."

In attempting to involve district councils and local populations directly in the game management business, Zimbabwe is a world pioneer. With proper training of personnel, in time District Councils should be able to become even more directly involved by actually taking over certain Safari Areas as safari operators so that all the profit accrues to the councils and to the people. At the same time, local councils might be encouraged to develop rustic tourist facilities with access to Sebungwe's wild areas, which would cater for Zimbabweans (including school children) and to international tourists.

In the meantime, however, more should be done to protect villagers from game in the major conflict zones and to ensure that some income from proper game management comes directly to them. Three ways have been suggested along these lines. One, which I believe should be implemented as soon as possible, is to establish buffer zones around the major game areas in which licensed village hunters are allowed to use a range of customary hunting techniques (such as fiber as opposed to wire snares). The second is to encourage farmers to place protective snares around gardens that lie within cultivation zones as defined by Agritex. In discussing this matter with National Parks staff we got conflicting views as to the legality of such snares. This matter should be sorted out rather than left to the discretion of individual wardens.

As for a third mechanism to protect farmers in conflict zones, this might involve a crop compensation scheme whereby farmers suffering crop losses certified by Agritex staff would receive monies from a District Council compensation fund which would be periodically replenished by the sale of animal products shot by game control officers in the areas most directly affected. Hence in each area, rather than responding to every complaint, game control officers would harvest a quota of animals on an annual basis, with the income generated going into the compensation fund.

Currently National Parks and Wildlife Management staff have a tendency to play down both the extent of crop raiding and the extent of protein hunger (arising from a very real protein deficiency) among local people. Even where they are aware of legitimate complaints, game wardens often are too busy to respond promptly. Faster action would be ensured if all safari operators were allowed to act as game control officers in exceptional cases, without the animals killed coming under their quota (in the case of a client killing such an

animal, he would have the option of retaining it for the relevant royalty if he so wished). The possibility of abuse of this responsibility — which concerned a number of wardens to whom we talked — could be reduced through the application of more careful selection criteria when safari concessions are awarded.

#### 14. Wage Employment

Thousands of local people (of whom over 90 percent are men) seek part-time employment during the dry season, while an unknown number of others hold relatively permanent appointments -- mainly as unskilled and semi-skilled labourers. Though wage labour is a crucially important part of the local economy, there is virtually no information on how many local people are employed within and without the Sebungwe region. There is an immediate need for a survey of wage labour employment possibilities within the Sebungwe (as well in the adjacent townships of Kamativi and Kariba), on the proportion of those filled by local people, and on future possibilities for increasing wage labour (including food for work programmes during periods of food shortage).

#### C. Possible Settlement Areas

It is clear that the carrying capacity of people in a number of Northern Sebungwe chieftaincies have been exceeded under present farming systems. Even with agricultural intensification, and the introduction of a diversified production system along the lines discussed in the previous section, it is doubtful if certain areas can support their increasing population. Examples include Mola and Sinamusanga. In such cases a number of options are available all of which would require at least some people to move into new areas. Three will be briefly discussed in this section. The first is the easiest for the people since it merely involves a gradual movement into adjacent areas, which is a continuation of a type of movement which has involved the Valley people for generations. In the case of Mola, such movement is already underway with people moving gradually into the Myobi Valley. As for Sinamusanga, there some people are colonizing the lake shore margin in the Sengwa estuary -- they and some of Sinagatenge's people being the first villagers to actually colonize the lake shore margin. So long as such vacant areas remain, people will colonize them unless more attractive options are present. The major trouble with such movements is that usually they are only a temporary solution to land pressure. They are also likely to increase conflicts between areas of human settlement and park and game management areas.

The second and third options involve voluntary settlement to more distant areas, one of which is currently completely closed to settlement. These are the Kariba lakeshore margin between the Sanyati

and Charara, and the Urungwe Safari Area. Utilization of either would involve giving up some land that falls under the jurisdiction of the Department of National Parks and Wildlife Management. While this could create a precedent to be used to whittle away at similar areas elsewhere, if present trends continue, including the type of immigration referred to in Section VI, there may be no option if other more valuable parks and wildlife management areas are to be maintained. Though careful soil surveys would have to be carried out before any plans were formulated, the Kariba lakeshore margin between the Sanyati and Charara could probably support several thousand Valley people on the basis of a diversified production system involving recessional cultivation, utilization of Panicus repens lakeshore pastures by cattle, fishing and aquaculture, dry land farming, small and medium scale irrigation, and wage labour in Kariba and other more distant township areas.

I believe that serious attention should be given to setting this area apart as a special settlement area for Valley people whose habitats present the greatest problems for themselves (in terms of realizing higher living standards) and for adjacent parks and game management areas. If properly prepared, such a settlement area might present advantages sufficiently great to attract, for example, Sinamusanga's or Mola's people -- although many older people might be initially unwilling to disrupt existing ties of kinship with adjacent chieftaincies (and here I wish to repeat my conviction that such moves should be completely voluntary). A more likely development would be colonization by a group of pioneers who would then be followed, if they were successful, by other households from the home area. If immigration to that area was strictly controlled, over a generation such movement could drain off the surplus population and perhaps reduce the overall population.

Currently in Mola there is some talk about consolidating the present population around a service centre. While this may make sense in terms of the provision of improved services and the protection of adjacent parks and game management areas, it makes little economic sense simply because it would be impossible to support the existing population on a more restricted land base. In other words, such consolidation becomes feasible only if carrying capacities in the core area are carefully calculated, a suitable area or areas exist for the surplus population (and there will be a surplus population), and those people are willing to move voluntarily to the new area or areas.

Setting aside the Urungwe Safari Area as a settlement area for Valley people is a far more extreme option. Not only does it involve the voluntary movement of people to an area outside the Kariba Lake Basin and Sebungwe Region, but it also involves moving people into a currently unoccupied Safari Area. On the other hand, if soil surveys indicated that the area could support thousands of people, its settlement could be another, more drastic mechanism for resolving

conflicts between people and game in more valuable parks and wildlife management areas within the Sebungwe. Settlement in the area might also be attractive to a number of Valley people since it would allow them to reoccupy a Zambezi River habitat. Such settlement presumably would be welcomed by the Zambian government since it would reduce, if not eliminate, the current spread of tsetse flies across the Zambezi -- a movement which has reduced the numbers of local Zambian cattle by at least 50 percent in recent years because of the resurgence in the area of bovine trypanosomiasis. Another impact of such settlement might be to reduce the probability of a dam being constructed at Mupata Gorge since this would flood much of the newly settled areas.

#### VI. SPECIAL PROBLEMS: IN-MIGRATION

If the current rates of in-migration into the Sebungwe Region continue, this movement one could jeopardize the implementation of a Sebungwe Regional Plan by filling up possible buffer zones between villages and parks and game management areas, and by filling up areas set aside for future occupancy by present inhabitants of the region. At the moment, people from Plateau areas appear to be moving into the Central and Northern portion of Gokwe District in significant numbers, while significant numbers of people from Gokwe and Lupane are moving into Binga District. Very few of these spontaneous settlers have received permission from the necessary authorities to colonize the lands involved. This issue of in-migration requires immediate attention by the appropriate authorities within the context of the Sebungwe Regional Plan. If it continues for many more years, and this is quite possible since spontaneous migration of enterprising settlers is very difficult to control, pressure on all parks and game management areas within the Sebungwe can be expected to increase dramatically unless other overflow areas are made available.

#### VII. THE URGENT NEED FOR PHYSICAL AND SOCIAL INFRASTRUCTURE WITHIN THE NORTHERN PORTION OF THE SEBUNGWE REGION

Because of its isolation, its underdeveloped state, and a general absence of marketing facilities, the development of the Sebungwe Region requires major financial inputs for both physical and social infrastructure. Especially crucial under physical infrastructure is a macadamized road running the length of Sebungwe from Wankie/Victoria Falls to Karoi. Such a road might well have high priority since it would not only open up the Sebungwe Region but it would also cut the distance and travel time between Wankie/Victoria Falls and Harare. As for opening up the Sebungwe, it would greatly facilitate the marketing of agricultural produce (including vegetables, turkish tobacco, and goats) to such mining centres as Wankie (with a labour force which presumably exceeds 3,000 people) and Kamativi. Additionally it would facilitate current plans to establish growth

centres in places like Siabuwa. And it would also make such splendid national parks as Chizarira more readily available to Zimbabwean nationals and international tourists. Indeed, such a road opens up an entirely new perspective for tourism since it would incorporate within one area the Zambezi River System from Victoria Falls to the Kariba Dam.

In addition to the main Wankie/Victoria Falls-Karoi road, improved access roads to such areas as Gokwe (and intervening regions along the Middle Sengwa), Chunga and Omay Communal Area are needed. The extension of rural electrification to Gatshe Gatshe also deserves consideration, especially if it becomes a major settlement area with a medium sized irrigation project, as does its extension to the Manjoro Plateau in Binga District. The feasibility of developing an improved lake transport system (possibly in conjunction with Zambia) also deserves study, especially as a means for linking Nyaminyama District Council, and Chunga in Binga District, to Kariba and Binga Townships.

As for social infrastructure, a special case can be made for the early completion of several secondary schools (with boarding facilities and education through Form IV) for the northern portion of Sebungwe. As already mentioned, the Valley people lag far behind the rest of Zimbabwe in regard to access to secondary education. Also urgently needed are training centres of all types, with special emphasis on agriculture, fisheries, and a wide range of technical subjects including blacksmithing (for repair of farm equipment), metal work, mechanics (for both surface and water transport), masonry and building. Improved medical facilities, especially preventive services at the community level, with the staff (including village health workers) to serve them are also deserving of priority.

#### VIII. THE INSTITUTIONALIZATION OF REGIONAL PLANNING AND DEVELOPMENT IN THE SEBUNGWE AND THE ROLE OF THE UNIVERSITY OF ZIMBABWE

Regional planning and development in the Sebungwe is made more difficult by the fact that the region consists of all or part of four districts which fall in three different provinces. There are a number of ways to proceed, three of which have been mentioned (and which themselves can be combined in various ways). The first is to continue the present arrangement whereby planning and implementation are the responsibility of a number of departments co-ordinated by a sub-committee of ARDA. Though such an arrangement makes eventual handing over to local government bodies and the various technical departments relatively easy, its weaknesses relate to lack of control over the activities of the various agencies involved. These could be partially resolved if ARDA has access to special funds which could be allocated to co-operating departments for designing and implementing various parts of the regional plan and if the sub-committee itself reported directly to the Minister for Co-ordination, a Ministerial Committee, or even the Office of the Prime Minister.

A second procedure (which could be combined with the first) would be to create a separate Sebungwe Province. This would greatly facilitate co-operation and co-ordination between the different district councils, the government departments, and other agencies involved. Such a province might stretch from the Gwaai River to Kariba Gorge (with the option of extending it to Chirundu if the Urungwe Safarai Area became a future settlement area). This province would include the townships of Kamativi, Binga, Gokwe, Sanyati and Kariba. The third procedure would be to create a Sebungwe Regional Authority with the authority and funds to plan and implement development and to finance the activities of participating departments and other governmental and non-governmental agencies.

Regardless of which procedure is followed I believe, with Professor Blackie, that there is a major role that the University of Zimbabwe could play in researching various development options, initiating a number of pilot schemes (which could be replicated by other agencies if successful), and monitoring and evaluating the implementation of the regional plan. In Professor Blackie's words, the Sebungwe could become "a super research area" for the University with participants drawn from the different faculties and centres. The active involvement of the University has a number of advantages. One is that the University, unlike government departments, can work freely across district and provincial boundaries, hence aiding the development of Sebungwe as a region. Another is that the University could launch almost immediately a number of research projects which could be followed up, where appropriate, by suitable pilot projects. A third is the possibility of a multidisciplinary approach, with research activities co-ordinated by a Sebungwe Committee (which could report to the current ARDA sub-committee) and with researchers periodically brought to the University's Lake Kariba Research Station at Sinamwenda (or to the Sengwa Research Station of the Department of National Parks and Wildlife Management) to discuss their findings and future activities. And a fourth would be to associate the University more directly with research related to development.

With appropriate funding for research activities and the recruitment of additional Zimbabwean and international research personnel, the University might initiate the following types of research projects.

- [1] Determination of appropriate small-scale dam sites for water development and irrigation through air photo interpretation combined with ground survey where indicated.
- [2] Identification from Lake Kariba Charts and aerial photographs of appropriate drawdown areas for recessional cultivation, grazing, and fisheries development.

- [3] Utilization of existing geological maps of the Sebungwe (the geology of which has been intensively studied by Professor Bond and his students), vegetation maps and aerial photographs to identify the better arable soils which then can be subject to more detailed soil surveys.
- [4] Assessing the agricultural productivity of the Siabuwa area which has been cultivated for generations by the densest population within the Northern Sebungwe. Not only would such a survey establish the potential and constraints for agricultural development in this important area, but it would also provide invaluable information on the fertility of the entire range of Madumabisa shales which occupy extensive areas within the Sebungwe.
- [5] Survey in more detail the nature of local production systems at the household and community level.
- [6] Look at the potential for wage employment for local people within the Sebungwe Region and in the adjacent townships of Wankie, Kamativi, and Kariba.
- [7] Carry out market surveys on goats, turkish tobacco and other local produce and implement pilot marketing schemes.
- [8] Formulate development strategies for specific areas in which human activities currently conflict with park and game management areas. One such area is Simunchembu where M.Sc. student in Zoology, Jeanette Clark, is currently carrying out a research project with the co-operation of the Department of National Parks and Wildlife.
- [9] Survey the health status of a carefully selected sample of village communities (which is bound to vary considerably from the information collected at hospitals and outpatient clinics in the area) so as to improve programmes of preventive medicine at village level.
- [10] Design appropriate surface and subsurface dams, and pumping devices suitable to Sebungwe conditions.

So as to facilitate manpower training for the University and other government agencies, use of students at the Bachelors, M.Sc. and Ph.D. levels as well as of post doctoral research fellows working under the supervision of appropriate faculty members should be encouraged with regard to these and other research development projects.

Because most development within the area should actively involve the various district councils, it is also important for the University and District Council personnel to work closely together. To

improve the capability of council personnel to carry out much greater future responsibilities it may be desirable to appoint one or more advisers to each council, with one of their major responsibilities being to train council personnel to carry out a range of technical and managerial activities (relating, for example, to the use of council vehicles for such development activities as the marketing of goats, kapenta, cotton, vegetables, and other cash crops, and the transport of stock for local shopkeepers without their own transport; to the purchase and management of council-run kapenta fishing rigs; and to the eventual management of select Safari Areas and a range of activities relating to game management).

Since it is doubtful that the University alone can handle all these tasks, serious consideration should be given to obtaining international finance to obtain the services of supplementary personnel where needed. Possible procedures for such recruitment were discussed with Professors Blackie, Bond, and Murphree.

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APPENDIX

I am indebted to hundreds of individuals who provided information on which this report draws. The partial listing that follows refers to those people who were especially helpful. They are listed in the order that they were met.

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P. K. Muyambi, District Administrator, Binga  
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Dr. Gonzalez, Medical Officer in Charge, Binga Hospital  
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