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**Preliminary Reflections on  
Research Issues and Strategies for a  
Long-Term (Five years or more) Study of  
Common Property and Natural Resource  
Management with Particular Emphasis  
upon the Zambezi River Basin.**

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## I. INTRODUCTION

This paper is intended to aid in the process by which interested parties within and without the University of Zimbabwe can refine, criticize, and redefine the critical issues in Zambezi River Basin development, how they might be best researched (combining both relevant policy and basic research), and what other actions might be appropriate. In setting out some of the social science issues involved, it becomes immediately evident that involvement of other disciplines is necessary. While one could draw up a list of the essential ones, processually these should come from other university units in the Zambezi area, and from the actual and proposed development programs and projects. It is suggested that these studies avail themselves of the latest methodologies in participatory research, monitoring, and evaluation to provide an interface with local populations. Indeed, it is hoped that these studies will provide an experiment for testing different methodologies and adopting those most appropriate for Zimbabwe.

This paper has been written at the request of Professor Marshall Murphree, Director, Centre for Applied Social Studies, University of Zimbabwe. The author has been privileged to accomplish this from June 30-July 31, 1987, as part of the faculty exchange program between the University of Zimbabwe and Michigan State University. My background includes several years of anthropological and socioeconomic research in West Africa and most recently a 30-month study of the Gambia River Basin. This project study included dam impact studies and baseline data collection in The Gambia, Guinea, and Senegal and provided me with a comparative basis to discuss some of the issues that might be fruitfully researched in Zimbabwe.

What strikes one immediately in reading current documentation for planned and proposed development projects in the Zambezi valley is how little discussion there is of the social-economic organization of current Zambezi residents. While the development efforts are designed to benefit them, the documents do not describe or analyze patterns of life. It is in this general arena where CASS can make a significant contribution. It very often takes a broad social science perspective to value and understand why and how people do what they do. This local level research can then inform larger scale decisions and policies.

The urgency for such research is great. Both planners and local populations could use a larger informational base and analytic framework for common property management and natural resource conservation and use. Currently there are different interpretations as to why the Zambezi should be "developed" or "conserved." One important perspective relies upon a simple population pressure model. In this view population pressure leads to land pressure, which in turn leads to the use of marginal lands in the Zambezi (and elsewhere), thereby hastening environmental degradation. The urgency for land use planning in this perspective is clear: Without controlling human and livestock populations the uniqueness of Zambezi Valley ecology will be lost. It may be that this model is in the end correct, but it is oversimplified and perhaps apocalyptic. I envision a more complex model and therefore a complex pattern of studies in the Zambezi. For example, given current technological constraints

and costs, agriculture will never be possible in some areas due to low rainfall or poor soils, or both. In other parts of the valley there are real threats to the ecology which need to be balanced with the needs of a peasantry lacking draught power and/or land. Long-term patterns of common property utilization could form an important benchmark to compare with current programs and strategies which have socialist ideals but involve increasing amounts of privatization and top-down planning. The latter may ignore district, ward, and village variations. This study does not argue against planning but rather seeks to generate research focused on specific socio-economic and ecological contexts and the requirements of local populations for planners to utilize, if they so choose. The research can also equally serve local populations in their efforts to make choices about common property issues, the balancing of wildlife versus livestock, and so forth. It is, after all, the local people who are to be both the productive actors and the guardians of the Zambezi ecology. How they will both improve their conditions of life and preserve the unique ecology of the Zambezi is the central research issue.

There are three assumptions from which this paper proceeds: First, CASS should be involved in a long-term study of the proposed and actual development in the mid-Zambezi Valley and in other parts of the basin as well. The creation of the Zambezi River Basin Co-Ordinating Unit appears to place highest priority on research within the terms of the Action Plan for the Environmental Management of the Common Zambezi River System (ZACPLAN). CASS's current focus on common property and natural resource issues combined with an emphasis on household and community decision-making processes will be an important contribution to macro-planning exercises that will probably not be carried out by other organizations.

Second, CASS should seek a positive role in the achievement of ambitious programs which will irreversibly alter the current situation in the Zambezi Valley. As greater resources are made available for Zambezi development, there will be increasing competition for their use. It is within the appropriate purview of social science to study and understand resource use availability and conflict, while providing positive alternatives when possible. The above does not imply that CASS take a noncritical stance toward different proposals and actions. Educated opinions are part of what a university has to offer even if not always appreciated.

Third, CASS should blend basic and applied research on natural resource and communal property management. Basic research is needed to counter many of the generalizations currently substituting for a deeper and more specific knowledge of the Zambezi Valley and its regional variations. To the degree possible, work should be interdisciplinary and collaborative since many of the current hypotheses about what constitutes carrying capacity and therefore appropriate human and livestock population densities, for example, need to be greatly clarified by agricultural and biological scientists for the different subregions within the larger Zambezi River Basin.

The case for CASS's involvement has been well articulated by Professor Marshall Murphree in his paper "Social Science Research on Natural Resource

Management in Zimbabwe Communal Lands." It is, in my view, essential that such involvement be defined more broadly than either the Zambezi or the communal lands. One underlying justification for Zambezi development (which most observers acknowledge may jeopardize its environment) and an underlying cause for the ever-increasing numbers of new settlers resides in pressure on communal lands. The description and analysis of these pressures varies and therefore strategies for what to do. No matter what the finer points of analysis, however, the result has been that the lesser populated "frontier zone" of the north has increasingly become a magnet for new settlers seeking more land for themselves and their livestock. How much this has been a consequence of the EEC-funded SADCC Regional Tsetse and Trypanosomiasis Control Programme is unknown. It is highly probable that, barring major droughts in the north, this pressure will intensify as the tsetse fly control program continues. Increased human and livestock populations in the Zambezi area will have a series of anticipated and unanticipated effects on forests, grazing lands, water, fisheries, and wildlife. While it has been suggested that arable land use is the subject of considerable research already, it is unclear to me how one would study and derive policy-relevant research at the household and community levels without studying agriculture.

A second reason for a broader geographical approach in contrast to a more restricted one resides in CASS's involvement with the Communal Areas Management Programme for Indigenous Resources (CAMPFIRE). This program includes areas outside the Zambezi, where some communities have opted for more holistic resource management. CASS already has a substantial commitment to assist in the planning, implementation, and ongoing evaluation of programs of this nature.

The third reason resides in the important grazing scheme studies now under way. These are of particular importance because of the association of livestock with the environmental pressures currently assumed to be destructive for the Zambezi area. It will be important to assess which grazing schemes do and don't work, as well as where and under what kinds of organizational forms to apply those lessons in the Zambezi. As will be evident below, current development plans assume limiting the numbers of livestock while providing mechanisms for the use of draught animals. Current plans deserve to be analyzed in light of experiences in other parts of Zimbabwe, and CASS is admirably placed to do such an analysis because of work already under way.

## **II. THE CONTEXT**

Several strong currents influence the present wave of development in the Zambezi River Basin. The three strongest appear to be: (1) the EEC-funded tsetse and trypanosomiasis control program, which permits livestock to live in previously inhospitable areas; (2) multiple efforts to separate the potential carriers of foot and mouth disease (principally buffalo); and (3) the preservation of valuable wild game species for revenues generated from hunting and tourism, as well as for conservation purposes. It is often pointed out that the tsetse control operations have preceded any land use planning. In

current documents the emphasis has been on the increasing uncontrolled movement of farmers and cattle into the valley, which potentially has a series of negative consequences on what has been conceptualized as a fragile or marginal environment for agriculture and livestock. Yet, one could argue that land use planning would not have taken place without some impetus and that the continued in-migration of Zimbabweans in search of land has been the catalyst for development activities.

Two contrasting approaches have characterized thinking about the appropriate use and development of the Zambezi. The first is to call for greater national planning and action to stem the swelling number of people and livestock in the region. For example, the consultants to the FAO study, Tsetse Area Development and Land Use Planning in the Zambezi Valley, Zimbabwe, suggest that the government ban all further settlement until appropriate land use planning has been carried out. Another development effort, the Kanyati Resource Management Programme, is said to be on hold until measures are taken to ensure that there is no further settlement and that the land use planning carried out can and will be respected. Who should determine what constitutes the right population numbers for both people and livestock and who should enforce these decisions will be a major research priority.

The second approach, while not opposed to land use planning, places greater emphasis on local management of the natural resource base (including wild game, forests, water, and pasture). The recommendation that resource management should devolve to the smallest viable and accountable community unit in the Communal Areas appears to be part of the CAMPFIRE program or strategy. This leads to such major research issues as what constitutes the most viable and responsive community unit and which local groups should manage common property and natural resources.

Research on other river basins in Africa has demonstrated that there is a strong tendency toward top-down planning and implementation. In many instances, the relationship between national governments and river basin peasantries was already difficult. Decisions to go ahead with major dams and irrigation projects were made without genuine consultation. For example, in the Senegal River Basin, where the project included an anti-salt barrage at Diama and a high dam at Manantali (in a remote region of Mali), plans were developed for relatively large-scale irrigation perimeters based on the double cropping of rice. Studies which demonstrated that Senegalese peasants did not stay and work on large-scale irrigated perimeters for double cropping were ignored. While Senegal imports major quantities of rice to feed its urban population, optimistic assumptions about the economies of large-scale perimeters and the willingness of peasants to give up their best land to work on them have been questioned. It is not simply that peasants are resistant to change; they are not. In Senegal they have been faced with major droughts since 1969, have had to make dramatic alterations in their farming systems, and are looking for viable agricultural alternatives. In response to peasant pressure, and overly optimistic economic predictions, a whole new series of research was commissioned along with wide experimentation on small-scale perimeters where Senegalese peasants maintain much greater autonomy and control over their agriculture.

The outcome of these shifts in policy and practice will not be known for several years as the dams are just being completed, but the principles of flexibility, and participation are critical both in the Senegal River Basin and the Zambezi.

Another important context of Zambezi development as yet in the formative stages is the Zambezi Intergovernmental Monitoring and Co-Ordinating Committee of the Zambezi Action Plan. This multinational effort under the auspices of SADCC and convened by the United Nations Environment Programme was established in May 1987. In the preliminary documents a very strong place is given to university involvement in studies of the Zambezi River system and its human uses. The creation of a new multinational framework contains positive features, such as the care which must be given to water use to avoid negative effects on communities downstream, as well as potentially negative aspects, such as the increasing separation of local populations from planning exercises. It would appear that most land use planning is by nature top-down. If so, and if it ignores historical reality, long-standing grievances may be sustained. In the case of the Zambezi Valley this could be true for those populations relocated by creation of the lake and by the development of national parks and safari areas. It would be particularly unfortunate if new settlers were given priority over those who have long been disadvantaged but nonetheless have made do without cattle and more modern infrastructures. In addition, top-down planning can overlook valuable local knowledge of and adaptations to specific environments. From a research and university perspective it is critical that one understand these deeper issues and create mechanisms of participatory research to present alternatives.

To reiterate, this line of thinking is not meant to denigrate planning but rather, when applicable, advocates an interactive methodology which takes into account local knowledge, interests, and history. Often this approach takes longer, but it may be far more economic in the long run by avoiding expensive failures which do not take into account factors that are critical for success from a community perspective. There now exists substantial documentation of resources wasted or saved by taking local knowledge into account. In particular, Putting People First, edited by World Bank sociologist Michael Cernea, provides numerous examples in agro-forestry, agriculture, fisheries, and roads of how planning and implementation can be done more effectively with such an approach. Equally important, the World Bank is now paying far greater attention to the complex relationships between development and environment, including its human components.

### **III. ISSUES IN ZAMBEZI DEVELOPMENT**

The following listing of issues is not meant to be exhaustive but to illustrate how complex, interrelated, and long-term they are. It demonstrates that interdisciplinary efforts are required to propose tentative answers to changing problems, and it suggests why methodological experimentation will facilitate a flexible and innovative university response. I emphasize participatory research for three reasons. First, the long-term valley residents'

systems of natural resource management are not well known, nor is it clear that the residents will necessarily benefit from current projects. Second, definition of issues from the local perspective tends to be specific, reflecting detailed knowledge of the valley, whereas more global planning may ignore local problems and differences. Third, the university can be more effective in providing specific information and perspectives that will not duplicate broader land-use planning exercises as proposed, for example, by the FAO. It is not my view that the participatory approach is best for all issues or that it is the single best methodology. I emphasize it because development experience indicates that projects and programs will be more successful when clearly and directly related to local systems, because it is consistent with CASS's strengths, and because it explores areas that other project components will tend to neglect. Clearly, there are longer term issues which need to be addressed at other than a local level and for which other methodologies are appropriate. In addition, while one can make questions, interviews, and data collection participatory, it is a far more difficult to make analysis and write-up equally so.

#### **A. Tsetse Fly Elimination and Land-Use Planning**

The Zimbabwean portion of the Zambezi Valley has never been entirely free of tsetse fly infestation. The presence of bovine and human trypanosomiasis has placed constraints upon human settlement and economic activity. These constraints are in the process of being removed through the EEC-funded tsetse eradication campaign. (There will remain the possibility for a resurgence of bovine trypanosomiasis since eradication activities have not been begun in the Zambian and Mozambican portions of the Zambezi.) Because of low human population density and the absence of domesticated animals, the Zambezi Valley has remained an important site for wild game. Its preservation has become an important issue involving hunters, safari operators, conservationists and ecologists, international scientists, and the government of Zimbabwe. Development of the valley and preservation of its wild life and "naturalness" has become a national and international issue.

Despite criticism of the EEC for proceeding with tsetse eradication without land use plans in place or without knowledge of the full range of consequences of its actions, the program is going forward. Dr. Colin Saunderson, Chairman, Parks and Wild Life Board of Zimbabwe, registered his concerns when he "deplored international double standards on conservation. While the world was concerned about Africa's position [in protecting wildlife], some organizations like the European Economic Community were funding programs of massive game slaughter and the use of fire to destroy vegetation to rid Zimbabwe of tsetse fly" (as quoted in The Herald 17 June 1987). Some ecologists view the tsetse control program as likely to destroy the fragile but stable ecosystem of the valley. Clearly, the actual ecological effects of the eradication and the consequent increased human and livestock occupation need to be studied in depth. My not giving greater emphasis to environmental study does not mean I view these issues as minor; they are central. Indeed, it is precisely because of the eradication program that the Zambezi has become a major focus for both conservation and development. In addition, the ecologists have already

published widely and impressively on these issues, and they have had an effect, because all development plans now are incorporating the natural resources (particularly wild game) component.

The eradication program has opened up issues of land use in the Zambezi. Who is to do the land-use planning? Will the same agency plan for all the Zambezi, or will it be ARDA in one instance and other government agencies in other areas? How will recently emphasized local initiatives and organization be reconciled with top-down planning? At least one commentator has stated that "the only way to have a practical and integrated programme for a sustainable management system is to centre it in the local population involving them at every stage" (Simon Metcalfe, of U.K.'s Save the Children, in a letter to the Financial Gazette, February 13, 1987). As do other approaches, this one also needs empirical confirmation. Since settlement is outpacing planning, there will be areas or zones where one can compare different schemes on the basis of the degree of control given to the local residents.

Another critical concern is already causing many problems for land-use planning in the Zambezi. In some communal areas it may be too late to halt the consequences since in-migrants have already put significant percentages of arable land under cultivation and have built their homes. As Dr. R. B. Martin observed with respect to Sebungwe:

"For two years (1980-81) I was involved in planning for the Sebungwe Region in Zimbabwe [an area of about 10% of the country]. I embarked on the project firmly believing that once we had established the correct land uses in the region, Government would rubber stamp the plan and somehow it would metamorphose on the ground. This still hasn't happened. The planning process taught me a great deal. Firstly, it was obvious that the people had already found all the best arable lands (without any help from the planners), that there wasn't much arable land left (despite politicians' statement made on the basis of occasional aircraft flights over the area) and finally, from interactions with the local communities during workshops that one cannot impose a plan from the top. The gap between conceptual planning and actually getting something done in the field was vast ("Wildlife Human Interactions," Conservation and Wildlife Management in Africa. Office of Training and Program Support, Forestry and Natural Resources Sector, U.S. Peace Corps, 1986)."

This pattern of movement into the Zambezi area has only intensified since Martin wrote. The communal areas of Gokwe, Guruve, and Kanyati have experienced an influx of new settlers. Land-use planning becomes far more difficult after the fact. If, indeed, this is the case, CAMPFIRE takes on a greater importance, as do studies of the in-migrants (see below). An example of community process in tackling the issues confronting the Zambezi region is the Development Conference held in June 1986 in Nyaminyami, where the

responsible political and administrative authorities together with the local population examined the range of development concerns in the district.

In general it would seem that there is a tension between top-down planning and creating local institutions, responsibilities, and management. This tension, which in the long term can be both healthy and creative, could form an important research focus for social scientists.

## **B. The Colonial Legacy of Land-Use Classifications**

There is neither space nor need to describe Zimbabwe's colonial land history. Ample and good analysis exists of the dualistic structure of rural lands between the commercial (formerly the white-owned lands taken from a range of Zimbabwean populations) and the communal lands (formerly the Tribal Trust areas to which Africans were forced in many instances to relocate). Little study, however, has been directed toward those populations relocated during colonial times from the national parks and safari lands. Their fate, and where they live, remains an unknown story except to them. As Bourdillon, Cheater, and Murphree observe with respect to the closing of 20 percent of the Zimbabwean shoreline on Lake Kariba to commercial fishing, the reasons are not understood by local fishermen. They apparently do not accept the Parks and Wild Life Board's explanations and consider the closed waters as part of the Kariba dam legacy. In the same way, grouping local hunters (particularly those guarding fields or searching for food) in the same category as more commercial poachers is not understood by valley populations. The division of land, its boundaries, the system of controls, and now the hoof and mouth and game fences are viewed by some as the legacy of earlier times. Their sense of an inequitable situation is heightened by the continued use of the lands by wealthy hunter/tourists. CAMPFIRE has not been widely enough adopted and more streamlined procedures have not been implemented to ensure that the benefits from safaris and hunting flow back quickly to local populations. These and past grievances about control of land may surface and become intensified as new settlers enter the valley. How benefits are distributed to those who lost resources earlier or who have been neglected until now is a significant policy issue in the management of the valley's communal resources.

## **C. In-Migration**

All observers are agreed that rates of in-migration into the Zambezi basin are high, but unknown. The most currently cited figure is that for Kanyati communal area, which had a population of around 137 in 1982 and more than 805 families (approximately 6400 people) now. Similarly, there are many new settlers in Dande, Gokwe, and Omay. Low populations and densities combined with the presence of tsetse contributed to the over-all ecology of the valley. Earlier conditions probably will be irreversibly altered unless government moves toward the unlikely course of large-scale forced removals.

It appears that most in-migrants are coming in search of land, but it is not known how many of them also work in urban centres. Their primary orientation seems to be toward agriculture, with the expectation that they will

be able to employ draught power and, in parts of Guruve, tractors. In his discussion of Sebungwe, Thayer Scudder (1982, p. 11) concluded:

"Granted that the people are already farmers, agricultural development must have primacy in any development programme for the Sebungwe region. Since cattle are associated with higher productivity and living standards, it also means that their introduction is necessary."

Indeed, in 1987 relatively large but unknown numbers of cattle have entered the Zambezi region. It would be interesting and significant to know the in-migrants, knowledge about the tsetse fly eradication program.

Current empirical evidence about in-migrants is weak. An analysis of the causes of in-migration urgently needs to be carried out. In Kanyati it appears that most in-migrants come voluntarily and spontaneously from elsewhere (although undoubtedly some are from communal areas adjacent to Lake Kariba). In contrast, the Mid-Zambezi Valley Rural Development Project has organized the location there of 4,600 families and intends to resettle 3,000 more in the lowlands, in parts of Guruve and Muzarabani districts. What struck me in reading the planning documents for this project was the lack of any discussion of or investigation into the possible consequences for and relationships between long-term residents and new immigrants. In addition, current land-use patterns and the underlying social organization were not examined in any detail. This lack of social inquiry prior to project implementation can lead to conflicts which might have been foreseen and avoided. In addition, little attention is paid in these documents as to how local and community responses can be incorporated into the plans.

#### **D. Man-Nature Balance in the Valley**

Genuine concern has been raised over preservation of the Zambezi Valley's ecology, both for its intrinsic value (not widely held except by conservationists) and its tourist/game value (including scenic beauty, hunting, and fishing, which brings in foreign exchange). R.B. Martin has commented that linking the existence of national parks to an international tourist market for revenues that only trickle down to local communities produces unresolvable tensions. He suggests that "a far better way to justify such protected areas to local communities is the argument that they are baseline control areas, set aside for future generations, which provide a permanent record of original flora and fauna in the face of surrounding land use changes" (1986, p. 214). Whatever stock one places in Martin's views, the pace and flow of in-migrants to the Zambezi have made it difficult to see how one can harmonize long-term conservation efforts with shorter term requirements for land and food. Perhaps if there had been a greater and more rapid implementation of CAMPFIRE and the development of community interest in reducing the flow, then the current situation would not be quite so serious.

In the discussion of nature-man relationships one suspects that nature is the better understood of the two, and there are many unresolved questions. (1)

What is the carrying capacity of the different kinds of land within the Zambezi Basin under different cropping and grazing systems and different human population densities? Is there a scientific basis for the catastrophic scenarios painted by conservationists? (2) What have been the longer term indigenous relationships to nature (for example, vegetation, forests, and animals), and what have been their historical variations? (3) What are the differences between the new in-migrants and the long-term residents both in their perceptions of and actions upon the environment? (4) How do Zambezi basin residents (including recent in-migrants) envision their future and what their environment will be like? (5) What will be the environmental consequences of different cropping and agricultural practices - both those employed by residents on their own and those recommended by implementing agencies (such as AGRITEX and ARDA)? These broad issues are not easy to research, but in my estimation they must be examined if one wants to grasp the complex dynamics of human-produced environmental changes in the Zambezi region.

#### **E. Agricultural Strategy Proposals**

As already observed, agricultural development has the highest priority for new, if not older, residents of the Zambezi. While neither the Kanyati nor the Mid-Zambezi projects are exclusively agricultural, that is a strong emphasis. In addition, Kanyati migrants have apparently come for agriculture, not for other valley resources. While game control, wildlife management, and restrictions upon livestock numbers are part of both projects, the modalities of implementation remain to be negotiated.

Numerous issues will require collaboration among agricultural scientists, agricultural economists, and other social scientists. A complete listing is not possible here, for they range from the very general to the very specific. For example, what is the long-term sustainability of current agricultural strategies proposed for the Zambezi given the soil and climatic conditions in different zones? What are the specific consequences upon food production coincident with the expansion of cotton production? Does the emphasis on cotton pose new labour constraints on different types of households?

One common aspect of the Mid-Zambezi and the Kanyati schemes is fixed land allocations for grazing, agriculture, and residence concordant with villagization. The underlying assumption of both projects appears to be that there is an undifferentiated rural population whose needs can be met by well-designed packages of seeds, insecticides, fertilizer, credit, and so forth. While this assumption may be correct for "new lands," such as Kanyati, it may pose greater difficulties in Dande, Omay, and elsewhere because of a preexistent (if undefined) differentiation, potential tensions between in-migrants and residents, and land tenure. The latter issue has not been addressed, but if systems in place are to be overridden by the tripartite division, one can anticipate conflicts over any reallocation. Among others, several matters may arouse local community concern. (1) Since arable land may not be equally productive, assigning the same size plots to each household will not be sensitive enough to types of soils and productivity. (2) Because households vary in resources, labour, wealth, support networks, aspirations, and skills,

they do not require the same amount of land. Implicit in these schemes is that individual households may borrow or lease land from others, which in turn will lead to potential significant changes in the land tenure system and therefore common property management systems. (3) The question of the next generation and land allocation has not been included in these proposals to date. Again, land tenure and inheritance patterns will be altered by these schemes.

A related issue concerns the introduction of small-scale irrigation. Who has rights to the land (if anyone) which will be irrigated, and how will reallocation be conducted? What are the longer term conditions of access to irrigated land, and how do they fit with rainfed fields and other economic activities? Small-scale irrigation is proposed for Kanyati and perhaps for Gatshe Gatshe, Muzarabani, and elsewhere. The relative importance of irrigation will grow rapidly in the next years.

National concerns about food security have a particular regional relevance in the Zambezi. Will these new in-migrants be food self-sufficient, will they be unable to sustain themselves in dry years, or will income from cotton production permit many households to purchase food even in bad years? The many food security issues, which vary in different parts of the Zambezi, require cooperation between agriculturalists and social scientists examining different kinds of households.

There are also fears about soil erosion and soil degradation produced by opening up woodlands to cultivation. Soil scientists and physical geographers could assess the situation periodically with the aim of suggesting alternative land use strategies to the implementing bodies if current fears are realized. In any event, settlers who are planning to live for long periods in these zones will have both the interest and motivation to maintain soil fertility and adopt their farming systems to different ecological contexts.

Other and more technical issues will require the agricultural scientist's input; these include credit, input supply, cooperatives, marketing, agricultural extension, preparation of farm budgets for different types of households, and use of draught power and mechanization (particularly in the Dande and Muzarabani areas). It is highly desirable that CASS link effectively with the specific monitoring and evaluation units as both the study and the projects begin. Even if these linkages are not as close as desired, there are strong grounds for CASS's involvement in studying agricultural change.

#### **F. Livestock Plans: Potentials and Risks**

The current debate around overstocking on communal lands and its role in the crisis of communal areas, farming systems is central to discussions of livestock's impact in the valley. Currently, limitations have been dictated by the presence of tsetse. Animals, particularly draft oxen (and increasingly donkeys), have been used to increase the area under cultivation by individual households. Throughout the valley, ownership of oxen appears to be an unmitigated good, as it increases both individual household food security and

income. The valley debate centres on the ecological consequences of opening up larger and larger tracts to cultivation with increasing numbers of livestock. To counter anticipated problems of overstocking both the mid-Zambezi and the Kanyati projects are attempting to limit herd size. The FAO consultants 1986 gave very high priority to animal production, recommending a series of specialists to study present and projected profitability and long-term viability of the livestock subsector in the commercial and communal areas and the wildlife sector. In addition, they are recommending technical assistance with animal production development in the Zambezi Valley (see p.75 of their 1986 report). They also recommend technical assistance for the wildlife sector.

If some of the studies recommended by the FAO are carried out, then the data base for the valley will be deepened. There needs to be much greater clarity on issues of carrying capacity. These studies can and should be added to CASS's ongoing examination of grazing schemes.

### **G. Forests and Vegetation: The Ignored Dimension**

Brief summaries of forestry issues, as in the FAO consultants' Tsetse Area Development and Land Use Planning in The Zambezi Valley, Zimbabwe report, suggest a narrow definition of both the problem and possible alternatives. The FAO report (1986, p. 12) states:

"Slightly less than half of the total land area of Zimbabwe is covered with forests and National Parks. An estimated 15 million hectares are miombo and mopane woodlands, traditionally exploited for fuelwood and pole supply. However these woodland have a low stocking, and are slow to regenerate. In areas of high population density the woodland has been seriously depleted, and firewood collection has become more difficult and time consuming."

In the Kanyati and mid-Zambezi project documents available to the author, indigenous vegetation and forests do not receive much attention. Woodlands and trees serve a range of functions for human and animal populations. Little research has been carried out in the valley on human uses of forest resources. In general, not enough attention has been paid to trees in agriculture, although great concern has been focused on the destruction of soil fertility by cutting down the forest cover and then ploughing. It may be that through studies by ecologists, foresters and agro-foresters, socioeconomists, and soil scientists that alternative farming systems and wood uses could be proposed for different parts of the valley which would be less disruptive of current ecosystems.

### **H. Game Management and Tourism**

The national parks and safari lands are simultaneously under greater pressure than ever before because of in-migrants and proposed settlement projects yet are of greater importance nationally because of the foreign exchange they generate. Ecologists and wildlife management experts have moved beyond

simply arguing that the Zambezi Valley should be kept for its "naturalness" and are seeking to demonstrate that proper game management combined with tourism will be more economic (that is, more profitable) than other alternative uses. Their arguments have gained national recognition and are partially incorporated into the Kanyati and mid-Zambezi projects. What seems more tenuous is the acceptance of the Communal Areas Management Programme for Indigenous Resources (CAMPFIRE). As will be discussed below, the shift from national to community control runs counter to past patterns, even though consistent with some current policies. Of particular interest are some of the assumptions underlying CAMPFIRE, which need further inquiry and experience. The logic rests upon giving communities a greater if not decisive economic interest in their natural resources. It is wildlife that can provide a direct and immediate financial return. "However, wildlife cannot be sustained without careful management of the natural vegetation and without assured water supplies. Thus the programme involves wildlife, forestry, grazing and water" (National Parks 1986). Within the context of increasing population and resource use, CAMPFIRE potentially can provide the mechanisms for relating each community to a defined territory. How this will work in practice bears both careful preparation to implement and careful investigation to see who benefits and what management mechanisms are put in place.

Nick Abel and Piers Blaikie (1986) suggest that we need a new perspective on conservation issues, which in turn implies different foci for research. They maintain, first that conservation is a highly political issue in the sense that it involves conflicting interests (even if one would like it to be otherwise). Second, one needs a longer historical delineation of the roots of contemporary problems of resource use. Thirdly, there need to be studies linking "human socioeconomic behaviour ... to good ecological models" (1986, p. 735). Their analysis led them to propose a new pattern for the utilization of wildlife resources within the national parks of Zambia on a rotational basis. In Zimbabwe there will need to be much greater policy clarification and research on human-animal patterns within and among communal areas, national parks, and safari lands.

My brief perusal of the literature suggests that the ecological literature on wildlife for Zimbabwe is much ahead of the socioeconomic side. The research agenda would need to include utilization of game meat (either through safari operator contributions or poaching by communal area residents), the economic contribution through employment, use of forestry and other products from the vegetation, and the basis for communal property cooperation. A major thrust for research might be the differing attitudes toward wild game and other resources held by new and older communities. In short, how can men work with alternative socioeconomic strategies to accommodate wildlife in the basin while limiting draught-based agriculture and the numbers of livestock?

### **I. Local Knowledge: an untapped resource**

The use of local knowledge has become well established in farming systems research and applied anthropology and sociology. It appears to be more difficult to persuade state agencies and extension services to take this

knowledge seriously. Local practices often are at variance with national or provincial guidelines. Within the valley, it will be hard to gain acceptance of the knowledge systems of the Tonga, Shangwe, and Doma people and perhaps of some of the smaller Shona communities. This becomes a critical issue for applied social science, both in obtaining that knowledge and effecting local policy changes when relevant.

#### **J. Squatters**

Squatting is linked to land pressure in the south and perhaps to the historical origins of the national park system and safari areas in the valley. Thayer Scudder states that the carrying capacity for people has been exceeded in Mola and Sinamusanga, and others have argued that this is true in the southern communal areas as well. The result has been illegal land occupations. Greater numbers of people already are resident in Kanyati than the project feels should be there, based on assumptions about the land's carrying capacity. Squatting has serious repercussions for any land use strategy. From a social science perspective, squatters may indicate problems and conflicts that bear further inquiry. For example, there apparently are substantial numbers of squatters in Charara safari area. Having learned of this, it would be desirable for CASS to have the capability to carry out a quick survey to find out if these people are from the nearby communal areas or have come from farther away, their reasons for coming, the kinds of economic activities with which they maintain themselves, and the nature of their communities. Despite the disruptive nature of squatting, it is obviously of interest in any broader research program for the valley as a whole.

#### **K. Maintenance of Cultural Diversity and Minorities**

There is very uneven knowledge about the different peoples currently inhabiting the valley. Little work has been carried out among the Doma (Dema) and Shangwe. The Goba have been studied on the Zambian side of the river but not on the Zimbabwean side. The Tonga have been studied on both sides, but greater attention has been focused on the Zambian portion. Because of the differential development strategies that have been pursued, there is some evidence that different patterns have emerged on the Zimbabwean side, and these deserve further study.

#### **L. Infrastructure and Growth Points**

All current proposals point to the isolation of and transport difficulties in many parts of the Zambezi basin. New and better roads will have a range of social effects, including greater and easier access for people both entering and leaving, new patterns of marketing, easier access by government agencies, and perhaps greater desire on the part of teachers, health workers, and other professionals to work there. The spread and increase of cotton production will be facilitated. Easier access may make it more difficult to maintain current game levels, but there may be advantages to local communities in terms of more effective marketing, since current bus service is unpredictable or nonexistent.

The provision of permanent water supplies and some irrigation will lead to greater population density because at present lack of water is a major constraint. The provision of bore holes may, in the longer term, have some of the same consequences as in the Sahel, but if animal and human watering points can be kept separate even in drought years, than the experience need not necessarily be repeated.

Growth points close to or in the basin should be part of any larger study. They will draw job-seekers, offer services, and be the homes of resident government staff. Their relationship to different basin activities may provide useful foci for applied research as well as the context in which one can follow development efforts. From a research standpoint, the culture of government agencies involved in development will be important in terms of implementing CAMPFIRE and understanding difficulties faced by agency staff.

#### **M. Administrative Issues**

A number of administrative ideas have been proposed in recent documents, but it is not clear to me that any decision has yet been made as to how government will precede. The main issue is whether there is a need to reorganize current province and district lines so as to have a means to deal with the Zambezi Valley through one administrative mechanism, or whether a Zambezi Valley Authority should be created (as suggested in the 1986 FAO report) which would deal with basin-wide concerns and programs. The valley includes portions of three provinces and ten districts (Wankie, Binga, Lupane, Gowkwe, Kariba, Urungwe, Guruve, Centenary, Darwin, and Rushinga). (Scudder, in considering Sebungwe, focused on the four districts next to or close to Lake Kariba.)

The broader context in which discussions are likely to take place about appropriate administrative authority is ZACPLAN, which is proposed to embrace all nations in the basin. How national administrative structures will mesh with international ones yet to be created is, of course, unknown. Most likely, a high-level decision will have to be made about the costs and benefits of creating a river basin authority or an appropriate administrative mode for Zimbabwe. Because there are already two different administrative modes, one for Kanyati (where the district council has asked ARDA to implement the project) and one for the mid-Zambezi project (where different agencies will carry out their general roles), the research situation is interesting.

There already is very important infrastructural development in place which needs to be kept in mind (for example, the dam and hydroelectric facilities at Kariba and Cabora Bassa). In contrast, multinational river basin commissions or authorities elsewhere in sub-Saharan Africa formed around the need to develop dams for hydroelectric power and impounded water for irrigation.

Whatever the ultimate administrative format developed for the Zambezi Basin, two other issues have greater immediacy and saliency: (1) villagization and (2) what constitutes community and the appropriate local groups for communal property management. Concerning the first, efforts are under way to

rationalize rural settlements, consolidate them, and divide the lands into clearly demarcated functional zones of arable, grazing, residential, and wildlife conservation (where applicable) areas. The argument for villagization centres on the more economic provision of such services as health clinics and schools if people lived close by, these would be more accessible and better utilized. Arguments against this policy centre on the current value of people's homes, the alteration of land use arrangements throughout the nation to conform with plans, and problems with large villages and concentration of herds, which would lead to loss of vegetation cover in drier zones like the Zambezi. In addition, rural people differ in how distant or close they would like to be to neighbours and services, while this is clearly a subjective matter, it nonetheless will be a very important factor in people's reactions. If villagization proceeds, it will place stress both upon those who have to implement the policy and those who have to move from their home to nearby but new locations.

Concerning the second issue, CAMPFIRE, grazing schemes, and communal resource management in general rely on local communities for their operation. The problem, as well identified in the literature, is that if no one "owns" a forest, or water source, or pasture, how can it be safeguarded for everyone's use? An important additional question is who benefits from communal resources when they are not used equally by the community, however defined. This is of central concern in the development of pasture management and grazing schemes, as well as in wildlife management. The Kanyati and Gatshe Gatshe Resettlement Project plans to establish a wildlife management trust, a nonprofit organization under district council supervision to manage and operate the game area, the latter is to be accomplished by the trust entering into a contract with one of the local hunting associations. This framework appears to be related to but different from CAMPFIRE, which envisaged natural resource cooperatives with membership open to all in the community. It will be important to monitor the institutionalization of village development committees (VIDCOs) and the operations of ward councils and their relationship to smaller residential and community groups under their administration to see which experiments do and do not succeed and why. In the Kanyati-Gatshe Gatshe plan VIDCOs are to be responsible for appropriate herd composition, use of timber, and so forth. If this pattern is followed in the larger zone, village-based groups will play an increasingly important role in natural resource management.

#### **IV. A COMPARISON OF THE ZAMBEZI PLANS WITH OTHER RIVER BASIN DEVELOPMENT**

This section could be elaborated in greater detail, but space does not permit extensive analysis. The essential point for the Zimbabwean portion of the Zambezi plans, already alluded to, is that development rest upon a use of the river system that differs from most other river basin projects. Perhaps experiences elsewhere will have greater relevance in the non-Zimbabwean portions of the Zambezi Basin. In general, river basin development seeks to generate hydroelectricity, store water for dry season irrigation, prevent floods,

and rationalize water use for all users - upstream and downstream. In Zimbabwe, the river has already been dammed for hydroelectric purposes. Owing to geological structure, Zimbabwe has not been blessed with much land directly irrigable from Lake Kariba, and thus the emphasis on irrigation will be slight for the Zambezi itself, more so for some of its tributaries. From Victoria Falls to the lake and from the dam to the border with Mozambique, the focus is more on preserving the ecology and wildlife and less on directly utilizing the river's waters. Current plans set aside riverain zones to be conserved and managed while emphasizing development inland from Lake Kariba (although there are multiple issues for the lake itself) and away from the Zambezi north and east of the dam. This is not to say that intensive development close to the river or on its tributaries would not affect the river, but is meant to indicate that current priorities and issues have a different emphasis in Zimbabwe as compared to planning for the Senegal, the Gambia, and Niger river basins, among others.

The Zimbabwean experience with Lake Kariba, tourist development, and the cooperative relationship with Zambia has more lessons to provide to other river basin developments than the reverse. Furthermore, Zimbabwe's focus on natural resource management and a framework for siting responsibility at local levels is much in advance of efforts in West Africa.

#### Gambia River Basin Development

In the proposed Gambia River Basin development plan a dam is to be constructed at Kekreti in eastern Senegal. It would impound waters which are the prime watering point in Niokolo-Koba National Park, Senegal's largest. Toward the east of the park are hunting grounds primarily used by French and other foreign hunters. There has been virtually no discussion to date of providing compensation to people who live on the border of the park and whose fields are damaged by wild animals, nor of sharing income derived from foreign hunters with local populations in whose domain the animals live. There has been considerable discussion of the effects on the national park of the dam, much of the construction would take place within its boundaries and would have both short- and long-term negative effects on wildlife and vegetation. It has been suggested that the dam's lake could become a tourist attraction, like Lake Kariba (although it would have to compete with the nearby ocean), and a fishing industry might be established. Due to Senegal's much larger commitment to developing the Senegal River Basin, it is unlikely that Kekreti will be built in the near future. Studies continue on the Gambia River's hydrology and fish potential, and small-scale irrigation projects are likely to proceed without assuming that the dams will be constructed.

In The Gambia an antisalt barrage had been planned, intended to block the tidal based upriver movement of saline ocean water during the dry season to permit pump irrigation. Currently, there is natural or tidal irrigation, but the lands are relatively limited owing to the scarcity of water during the dry season, due to low rainfall and the upward movement of the salt tongue. Here, issues of common property rights to water and irrigated land are relevant to the development of irrigation in the communal areas. Naturally or tidally irrigated

land in The Gambia falls under systems of land tenure outside direct government or state control. Rights and access to this kind of land have clearly been limited by ecology and the distance of villages from the river, but the lands are held by lineages which allocate access to their women members - both by birth and marriage. If a woman's daughters remain in or near their natal village, the mother's rice fields can be passed on to them. With pump irrigation, however, access has been mediated by the government or by project management, and such land has tended to move out of the lineage into private hands. If others want access to it they lease it from the individual who "owns" the land. Most of irrigated pump land is controlled by master farmers who have greater access to a range of inputs, hard to obtain under The Gambia's difficult economic conditions. The government has been deeply involved in one 1,000-hectare irrigation scheme where the land can only be leased to individuals, the title remaining with the irrigation authority. This arrangement gives the authority leverage over peasants fulfilling their labour requirements for seeding, transplanting, daily water, weeding, harvesting, and marketing. Those peasants who do not carry out their responsibilities can lose access to their irrigated plots, although government does not intervene with respect to rainfed plots. These issues will arise in those portions of the Zambezi Basin where irrigation is possible.

### Senegal River Basin Development

A brief description of Senegal River developments was provided earlier (Part II). What can be added here is that the same issues arise as in The Gambia: What rights do cultivators have, and what kind of land security do they obtain when they work on pump irrigated fields? Initially, the Senegalese government wanted land to remain fully with the state through an irrigation parastatal. However, questions have been raised about whether the strategy of denying land security to cultivators is the best one. Currently, Senegal will plan for both smaller perimeters in the middle portion of the river valley and large farms toward the lower end, where the land will not be controlled by the peasants. Senegal is and will be experimenting with different types of irrigation perimeters and devolving authority to the local level because of experience, peasant resistance, and multiple studies. These have combined to demonstrate that the strategy of large irrigated double-cropped rice perimeters will not work without large government subsidies.

The development context of the Senegal River Basin differs markedly from much of Zimbabwe. The area has served as a large labour reservoir a trend which has intensified due to drought conditions in Senegal since the late 1960s. Much time, effort, and money have been spent trying to stem the rural exodus but without success. It is hoped that involving peasants in smaller scale perimeters and crop diversification will slow the flow. The situation in western Africa generally is characterized by less success in keeping people on the land and in agriculture. While an increasing rate of urbanization is becoming a problem in Zimbabwe, this is not the case in the Zambezi area, where the problem is the reverse; how to limit the numbers of people entering a "frontier zone."

Lessons learned in Senegal regarding research strategies and participation do have applicability in Zimbabwe. These involve several multidisciplinary studies, analysis of peasant household strategies, analysis of state-peasant relationships, rights to water and irrigated land, and some beginning attempts to model the river systems. These will prove, in my view, of greater use in the wider studies of the entire Zambezi River system than in the specific issues of resource management and communal property in Zimbabwe, with the exception of irrigation water and land rights.

### **Sahelian Grazing Management**

A central part of land use planning in the Zambezi Basin involves dividing arable from grazing land. Management of the latter has been difficult throughout sub-Saharan Africa, where there is marked inequality in livestock holdings. A rich literature from western, eastern and southern Africa describes both livestock systems and efforts to tackle particular problems. The overall problem in the Sahel is twofold: (1) increase the off-take to market, thereby increasing the meat available primarily to urban markets, and (2) change grazing practices to avoid deforestation, soil erosion, and loss of value in national livestock herds. The projects in West Africa, unfortunately, have been characterized by their failures rather than successes. For a range of reasons, rural populations have been reluctant to invest the labour necessary to manage livestock pasture communally. Many commentators have suggested that the bore hole schemes during the late colonial and postcolonial periods intensified sedentarization, with very negative ecological consequences. I evaluated a project in The Gambia which included a scheme whose goal was to fence grazing areas to provide good pasture at the end of the dry season. At the project's conclusion there had been little adoption by livestock owners, who instead adopted storing groundnut hay and maize stover to feed to their own animals or even sell. They were much more reluctant to enter into cooperative agreements about managed pasture. The situation has some parallels to Zimbabwe since livestock ownership is not evenly distributed while grazing land is communal. In the Gambian case, only livestock owners participated in the plans, and without continued outside donor support to provide, for example, the fencing, the schemes would not continue. Despite the success of providing the technical package of grass seeds, fencing, and extension help, Gambian livestock owners chose to continue herding as in the past, risking the lack of pasture at the end of the dry season. They were unwilling to accept limits on the numbers of animals they could keep in the pasture areas, which necessitated dividing their herds. Perhaps five years is too short a time for these types of projects to work. Such efforts have been characteristic of the West African experience, hampered by inadequate local consultation and the failure to incorporate local knowledge into project design.

The current grazing scheme study being undertaken will describe the parallels and contrasts of other African development efforts to those in Zimbabwe.

## Processes of Consultation and the Mackenzie River Valley Pipeline

One could produce accounts from throughout the world cataloguing successful project planning and implementation which involved local groups and communities. Yet, the literature also demonstrates how difficult it is for government to encourage and solicit genuine participation without pressure and the formation of interest groups bent on achieving specific goals. In the breach, the authorities assume all too often that people are the obstacles to development and more rational planning. Alternative logics and procedures on the part of local populations tend to be viewed as clinging to irrational tradition rather than as life-long and generational experience as to how to adapt to specific circumstances. It is difficult to construct the mechanisms to have government listen, especially if politics enters the picture. Let me provide one brief example, although the documentary record is voluminous. The Canadian government planned a pipeline to tap oil deposits in the Mackenzie River Delta, which drains into the Arctic Ocean. The oil was to be moved by an underground pipe along the Mackenzie River Valley and across the Canadian plains to a storage facility, then refined primarily for the U.S. market. As the plan became more widely known it was opposed by Canadian conservationists but most important by the indigenous people of the valley, the Dene and the Inuit (Eskimos). Many studies were done of the environmental and social impacts of the pipeline, but no consultation was initially provided with the indigenous people. So much controversy arose about the potential damage to the river, surrounding lands, and people's way of life that the government ordered a commission to investigate. It appointed a justice of the British Columbia supreme court, Thomas Berger, to hold a formal inquiry. He asked that the Dene and Inuit be permitted to commission their own research, and while scholars examined the earlier studies and carried out new ones, he decided to visit the native communities and solicit their understanding of what the project would mean. Over several months Justice Berger gathered enormous amounts of testimony and concluded that the environmental and social disruption was too great and the knowledge base too small to justify the risks, especially since the project did not appear to serve Canadian national interests but American ones. His proposals were accepted by the Canadian government, which declared a ten-year moratorium on any Mackenzie Valley developments. The decade has now elapsed and a much smaller scale pipeline is being constructed; it will provide employment opportunities for local people, will be less disruptive of animal migration, and will pose less risk in general to the environment.

Consultation procedures also have been followed in energy development on U.S. Indian reservations. Along power line routes, communities which stand to lose pasture and farmland are now consulted, and the potential environmental and social impacts are explained to them. In turn, they communicate their views to the implementing agencies. This differs from the process followed in the 1950s and 1960s, when the U.S. Bureau of Indian Affairs was assumed to speak for American Indians and could provide leases to energy companies.

The question of local experience and its incorporation into planning is taken up in the methodological discussion of participatory research.

## V. PRIORITIES FOR RESEARCH

I have noted numerous research issues, and undoubtedly others will have different perspectives on the appropriate priorities. In addition, an agenda cannot be decided in the abstract but only in relation to available resources and regional interests. The scale of the research is great. In my view, the best approach would be to consider the whole Zambezi Valley, as defined in the FAO report, in order to keep pace with regional development initiatives and with the tsetse fly eradication program. Within that overall framework, emphasis could be placed on areas where projects exist or are likely to commence. This includes the Mid-Zambezi Development Programme (Dande and Muzarabani communal lands), the Resource Management Project for Kanyati and Gatshe Gatshe Communal Areas, and the Omay Development Scheme (the consultancy planning exercise began in October 1987). The focus should be on how communal land natural resource management is proceeding. Yet, there are other areas where these issues could be addressed in the absence of projects, providing important comparisons with local decision-making in contrast to greater land-use planning. Furthermore, given my anthropological bias, for at least two peoples - the Doma and the Shangwe - the written literature is extremely weak, and basic studies of these groups should be given priority.

As to what CASS can provide that will not be carried out by other disciplines, the central contribution will be the description and analysis of current natural resource management strategies. CASS also can detail the current range of decisions concerning labour investment made by communities and households, as well as what these units think is genuinely realistic for them to undertake. It is essential that many aspects of environmental utilization be guided by the findings of ecologists and biological and agricultural scientists. Processually, CASS can define its research priorities in the expectation that other disciplines will do the same. This can serve as the basis for collaboration based on discussion with the relevant departments and individuals. Clearly, there will need to be much flexibility on all sides.

I believe that in order to respond to the social, economic, and ecological changes which are and will be occurring in the Zambezi, CASS needs to focus on the local systems of environmental utilization of natural regions and their current systems of management. CASS also is well suited to learn in much greater detail how longer term residents in different parts of the Zambezi utilize natural resources, and the study of what, if any, systems of management they adopt is a long-term research activity, unlikely to be done by any governmental agency or other research group. Moreover, CASS is well placed to argue for the importance of local knowledge. Among other topics CASS might pursue, several are suggested here. (1) A study of the environmental world view, including religious systems, of valley residents would enable better understanding of past and current systems for resource identification, utilization, and management. The ideologies of environment held by both residents and developers would appear crucial in local systems of common property management. (2) The different groups seeking to utilize the Zambezi environments need to be identified. These include local hunter-cultivators,

cultivators/peasants, safari hunters, administrators, politicians, conservationists, and, increasingly, donor agencies. Each of these will pursue its interests, and in their interaction and competition both policy and practice will emerge. (3) A study of common property management of water, particularly irrigation. An informal system has developed for hand irrigation of gardens during the dry season, but experience with even small-scale dams has been quite limited along the Zambezi. (4) A longer term historical study is needed of land-use practices in those areas of the Zambezi where these systems are not well known. This would facilitate separating short- and long-term issues, in particular in assessing the social effects of the tsetse eradication campaign. (5) There should be a critical examination of the primacy given to beef export, its profitability to Zimbabwe, and the consequences (particularly for the Zambezi), including game fences, as well as the effect of increasing livestock populations to meet this stated national priority.

At least three other categories of issues could fruitfully be pursued. First, the socio-legal dimensions of changes in land tenure systems could be examined, including the legal status of communal areas, safari areas, and national parks; contracts between safari operators and government; and relations among communal areas, district councils, and village committees. This would supplement CASS's excellent work in socio-legal studies. Second, one could be more explicit about the political economy dimensions of the Zambezi, including international tourism but also energy. The long history of appropriation of wealth from the valley appears to be continuing but under new forms; knowing how and in what ways could serve to place the Zambezi Valley in a broader context. Third, family patterns have not been discussed explicitly, clearly an important aspect in understanding how in-migrants respond to economic opportunities and ecological constraints in their family organizations. In addition, some attention could be paid to gender roles among in-migrants as they adjust to projects and a new lands context. Parallel efforts could be carried out with the other populations. All of the above assumes the extension of the grazing scheme study to relevant portions of the Zambezi.

I would also like to comment briefly on an area related to research, building collaboration with other university units. Professor Murphree has discussed the costs and benefits of an integrated, collaborative approach across relevant disciplines. Substantively, such cooperation is essential to high quality studies, but genuine collaboration takes patience and the commitment of individual researchers. In addition, considerable time is needed to work out the methodological and substantive approaches. On balance, and taking into account the administrative time needed to build a long-term collaborative program, the benefits to the university outweigh the costs. Professor Murphree has pointed out the critical rationale for university input into the planning, implementation, monitoring, and evaluation of development issues, which builds the university's capacity in Zimbabwean social science scholarship and strengthens interdepartmental collaboration.

## **VI. SOME METHODOLOGICAL CONCERNS AND ISSUES**

Any research strategy will depend on the resources available. The first step in deciding priorities will be to define and conceptualize the substantive area of inquiry and the geographical scope. My own intuition, as stated above, is that the Zambezi Valley as a whole, from the west to east, should be the general focus. Delimiting the study area will be arbitrary economically and socially but not ecologically if one uses the Zambezi watershed. This is based on a longer term view which can envision increasing erosion as a major issue for Kariba Dam, or environmental and social consequences of certain cropping patterns, or mining affecting population distribution, densities, water quality, and so forth, in the basin. It may permit a research strategy which is less dependent on particular projects. Yet, a more limited perspective, concentrated on those areas with specific development activities, is certainly viable, and the advantages could be a clearer focus and a more limited geographical spread. It would have been useful had there been a series of studies in those areas now slotted for development. Perhaps the parallel argument could be made to study areas outside current proposed projects to obtain needed baseline data.

Whatever the geographical area defined, it will be quite large and dispersed. A range of methodologies will be required to yield a balance not only between extensive and intensive knowledge, but also between knowledge of relevance to planners and participants. In addition, the production of that knowledge will be tempered by interdisciplinary concerns that at times will be exciting or inhibiting. One important dimension of any of the research will be its longitudinal nature. The examination of households, villages, or organizations over five years provides a continuity and potential relationship with people that can have a greater impact than short-term surveys.

It is obvious to say that any social science research should be both quantitative and qualitative. Which quantitative approaches and qualitative standards should be used to answer what questions are the issue. The methodological complexity is increased because one also has to sustain an applied focus. My own experience and knowledge of the Zambezi are too limited to permit more than an enumeration of some possibilities I find interesting or significant. The applied focus implies generating answers to questions of relevance either to planners or to local populations. In some instances, information and analysis may not be what is needed but instead assistance with organizational procedures, for example, in implementing CAMPFIRE.

The broad concern is to relate the appropriate methodologies to CASS's overall objectives. In addition, a study of such scope contains the potential for experimenting and developing new methodologies for future use. This cannot be done in the abstract but only by keeping in mind those who will use the results, including but not exclusively academics.

In such a complex, interdisciplinary effort, one should be clear from the outset that the research design is likely to evolve rather than remain fixed. The

research can be developed by periods so that there will be time to rethink the design and develop new strategies, foci, and instruments when needed.

The first step is to collect all statistical data for the Zambezi River Basin. The results of family planning surveys and censuses of population, livestock, and game during both the colonial and independence periods can indicate what is and is not known about the demographic and other characteristics of the Zambezi. A second step would be a bibliography on the Zimbabwean portion of the basin, and a third would be to examine the archives for important material on the environment and cultures through time. I suspect there is much to be learned in the archives about changing perceptions of the Zambezi and its populations.

Clearly, such scope demands great flexibility and responsiveness to changing conditions, but it equally requires consistency in determining units of study that can be systematically followed for at least five years. Professor Murphree's suggestion of choosing random households from air photos to provide baseline data is a good one, this can be done by drawing grids on the photos. The criteria for stratified samples apparently would need to be generated after examining data from at least one year of household studies. Establishing a random sample from each of the communal areas within the Zambezi Basin may involve too many households. The 1982 FAO figure is 262,013 people, probably an underestimate, but one could restrict the study area as discussed above. Since drawing a random statistically significant sample for the whole basin may be too great an undertaking, decisions will need to be made about which districts from which to choose households. Those decisions, in turn, will be affected by the emphasis CASS places on districts where significant outside funded development is planned or ongoing, as opposed to areas where none is forecast. Random sampling, however, might miss households for which one might want to have comparable data. For example, one may want to examine households dependent on fishing or hunting, that are participating in irrigation schemes, and so forth. It would be best if a means could be found to determine from the aerial photos which households have these features, but this may not be possible.

The sampling can provide baseline socioeconomic data. Within households one needs to decide who should be interviewed, perhaps on a random basis and including children, the value of this latter is indicated by Pam Reynold's work. Of relevance could be people's views on their education, work responsibilities, and perceptions of the environment as well as data on their labour, economic contributions to the household, and eating patterns. It appears that for household surveys a combination of structured questionnaires and interviews (both open ended and closed) is desirable. Information could be sought on household histories, migration histories, household ceremonial and labour exchanges, adoption of recommended agricultural and other practices (such as healthcare) and attitudes about them, herding practices and techniques, knowledge and use of indigenous resources, and perceptions of what constitutes important changes.

Simultaneously with household surveys and interviews, a number of thematic studies might be launched. The nature of these could be determined (1) by CASS, (2) by CASS and other university units, or (3) by CASS and other units, and local populations, who might determine what kinds of information and analysis they may need. Defining the local population and the modalities of its participation is difficult. Local groups and communities usually are not homogeneous, nor are they same from one district to another or even within districts. There is also the important question of which administrative/political units with which to work - the VIDCOs and/or WADCOs, villages, or cooperatives. The principle that one should choose the smallest possible group dealing with communal property and resource management is a good starting place. However, the broader context of planning, policy, political economy, and ecology cannot necessarily be derived from micro-studies. In addition, thematic research, while focusing on communal areas, might include studies of safari operators, tourism, and other factors which greatly affect communal life. A major theme that appears highly significant is the presence of thousands of recent in-migrants to the region. One needs to know how they adjust, the land-use patterns they follow, the social reactions between them and the older residents, their outside sources of income in comparison to others, whether there are new patterns of conflict over resource use and management in the area, and so forth. Additional questions include what prompted migration, what services are provided to in-migrants, how they respond to years of drought, what cropping patterns they follow, what perceptions they have of their new environment, and how satisfied they are with their new home. These are only some of many themes that could be pursued. I would think that studies of in-migrants would be a high priority. Methodologically, one hopes that a relatively easy way can be found to identify recent in-migrants without having to carry out a census.

Other and broadly defined methodological concerns, revolve around assistance to local groups in implementing programs, specifically CAMPFIRE. Professor Murphree has indicated at least two domains in which social scientists would be of use: (1) assisting in overcoming "local-level deficiencies in managerial and administrative capacities, largely related to inexperience and a lack of communicative and educational inputs" and (2) assisting in the understanding of "marketing demands and the requirements of adequate marketing structures." In short, there needs to be an integration of specific applied dimensions with other aspects of the study. It is not an easy matter to select groups to assist and under what circumstances, since decisions are based on judgments about groups' effectiveness, commitment, and accountability to their local community.

Given the complex issues delineated and the brief for CASS that has been provided by Professor Murphree, a participatory research stance may be appropriate. It appears to me counterproductive to worry about some or most of the development plans being top-down and then design a research strategy to demonstrate they are top-down. One could anticipate a conclusion that it would have been preferable to have had greater community input, consultation, and participation in planning. Perhaps CASS should begin by

subjecting its overall research approach to local input, from the planning and design phase onward.

Participatory research is very difficult, and I certainly am not convinced that it will be appropriate for all parts of the study. In my estimation, and given the knowledge base of rural populations, it is fitting for some aspects. Sample household questionnaires might be altered to elicit data that planning agents and local groups might like to know, for example, the overall dependence on remittances and wage labour. It might be important to know how much wild game meat is being provided to local communities by safari operators and how significant a part of the diet that is. Or communities might like to be informed about current practice and returns from safari operations, about which they may know little, to better assess the likelihood of success in establishing CAMPFIRE.

One procedure would be to take a questionnaire to as many district councils, ward councillors, and households as possible to identify their view of their major problems. CASS clearly would and could not respond to all comments, but it could focus on those related to common property and natural resource management. Having obtained a range of views and identified problems, CASS then could return to those same groups to propose how a study might proceed and ways in which CASS might provide some resources for implementing CAMPFIRE. At the same time, CASS could also explain the wider basis of the study and arrange for people in different parts of the Zambezi to meet to discuss common problems, for example, the destruction of fields by wild animals and how one might devise compensation for such losses out of wildlife revenues. After these follow-up meetings, the research would have been partly redefined to pursue local interests as well as the broader issues defined by CASS. Periodic meetings might be held in relevant communities to discuss ongoing findings, although this may prove more difficult than it appears because of the high profile of donor agencies with whom CASS cannot compete in terms of providing resources. In addition, there might be added studies partially carried out with community resources, for example, a cataloguing of all trees and vegetation and their uses (ethnobotany) perhaps to demonstrate what might be lost through uncontrolled changes in land use as well as to document changes taking place.

As CASS will also be involved in researching the range of development initiatives in the Zambezi, discussing the results of those studies may be more sensitive since it will involve both international donor organizations and Zimbabwe implementing agencies. In this context, CASS will have to be responsible both to Zimbabwean administrative and technical personnel as well as to local communities for both the framing of questions to be researched and the sharing of results.

## VII. SUMMARY

This working document raises a series of issues relevant to Zambezi River Basin development. After reflecting on these matters, there is reason for

deep concern about the environmental consequences of current programs, which in turn will affect both residents and natural resources. Zambezi development cannot be theoretically separated from the national land question. Frontier or hinterland settlement will relieve some pressure on other communal lands but risks long-term environmental damage for short-term gains. I wonder about potential conflicts being created by providing external resources for Zambezi projects and to in-migrants when those services and inputs have not (until now) been provided to Zambezi populations or to other areas within Zimbabwe.

A second concern is who is generating the pace, scale, and timing of development? How much will the Zambezi become an experiment for donors, leaving out bottom-up concerns? This could be elaborated a great deal because the link between the EEC beef market and eradication of the tsetse, an externally generated program with vast consequences. But the point here is not to rehash what has already been said but to argue that CASS's role in studying the Zambezi should include trying to inject participatory research methods to help a counter current trends.

These concerns also have led me to perceive another role for CASS, in coordination with other university departments, namely, study of the mechanisms prompting migration to the Zambezi from the source areas. I would give this subject high priority, with special attention to migration patterns and whether particular communal areas are serving as the source. If this is the case, then brief studies of those communal areas could underscore that depletion of Zambezi resources will not resolve deeper issues.

My overview has focused a great deal more on agriculture than was the case in Professor Murphree's working document. Separating agriculture from other natural resource management can be done, but then one risks peripheralizing the foci and relevance of CASS's studies. Unless the dynamics of agriculture in different regions of the Zambezi are understood, it is hard for me to visualize how one would understand household decisions-making and use of wild game and other wild products.

In my estimation, the particular strength of CASS rests in its micro-level orientation, that is, studies focusing on indigenous systems, adaptations, and knowledge. However, to make these studies of more general use, they could be combined with broader issues. In particular, a range of macro-policy matters deserve much greater attention than I have provided. They will be better studied if there is a fuller understanding of the micro-level social, economic, and ecological contexts. If CASS desires to have more dialogue with policy makers, then such a dual focus is important. An excellent example would be the current study of grazing schemes. The extent to which Zambezi development rests on successful management of livestock in turn depends upon these schemes. Their likelihood for success or failure, in the Zambezi can be assessed by the present research if it includes examination of current development efforts.

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