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**TSETSE CONTROL, LAND USE AND LIVESTOCK IN THE
DEVELOPMENT OF THE ZAMBEZI VALLEY, ZIMBABWE:
SOME POLICY CONSIDERATIONS**

by

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Introduction

1. Throughout Africa the importance of land use issues in relation to tsetse control planning has been emphasized consistently in the tsetse literature (Ford, 1971; Jahnke, 1974; Putt et al, 1980; Jordan, 1986; Hendy and Makin, 1987). Because of inappropriate land use, concerns for the environment in tsetse-free areas have been expressed frequently (Matzke, 1983; Matthiessen and Douthwaite, 1985; Ormerod, 1986; Kempf, 1988).
2. This debate is very relevant to Zimbabwe, where extensive tsetse control operations in recent years have confined the remaining area of tsetse infestation to parts of the Zambezi Valley (see Map 1), a semi-arid region of the country with a fragile eco-system and limited agricultural potential. The Government of Zimbabwe has ambitious plans for rural development in the Valley, including proposals for tsetse control and the expansion of agro-pastoral peasant farming.
3. This paper examines the socio-economic objectives behind plans for development of the Zambezi Valley and the arguments for and against tsetse control operations in support of sustainable rural development in Zimbabwe.

Land hunger and rural agricultural development policy

4. Zimbabwe's population in 1989 is in the order of 9 million and has one of the highest growth rates in Africa. Most of the population is located in the so-called 'Communal Lands' which generally have much lower agricultural potential and received substantially less government attention prior to independence than the commercial farming areas in the highveld centre of the country. Land hunger and inequity of land distribution have been important political issues in Zimbabwe both before and after independence (World Bank, 1986). Accordingly, land resettlement and rural agricultural development have been central policies in national development planning since independence in 1980 (ZIMCORD, 1981; Republic of Zimbabwe, 1986 and 1988).
5. Following independence the Government declared in the Transitional National Development Plan its objective to resettle 162,000 peasant families within three years, to be achieved through acquisition of commercial farms on a 'willing buyer - willing seller' basis. Total cost of the three-year programme was budgeted at Z\$260 million (constant 1981 prices; equivalent to approximately US\$360 million at that time) which reflects the perceived political importance of resettlement. Progress in the programme has been much slower and more

difficulties have been experienced than expected (Whitlow, 1985; Republic of Zimbabwe, 1986). At the beginning of 1989, the total number of families resettled within the programme since independence is in the order of 45,000. Other avenues for relieving the pressures of land hunger more rapidly are therefore politically attractive.

6. Substantial areas in the more marginal, tsetse-infested, parts of Zimbabwe have been viewed by Government as underpopulated, underexploited and capable of supporting peasant agriculture. Accordingly ambitious rural resettlement and development programmes have been initiated in the Zambezi Valley within the tsetse belt, with the aim of expanding the frontiers of sustainable communal farming and increasing the number of settlers.

Land use planning in the Zambezi Valley

7. Land use planning in the tse-tse-infested area of the Zambezi Valley has been the subject of two FAO consultancies (Green, 1985; Brunt et al, 1986). The latter study made a broad assessment of the development potential of the Valley and made recommendations for strengthening and coordination of land use planning in the area. Emphasis was placed on the need to keep tsetse control, land use planning and the actual implementation of development projects in balance. The Zambezi Society (1988) recently compiled a directory of the many land use development projects in progress in the Zambezi Valley.
8. FAO is funding a project presently in progress to prepare a 'Master Plan' for the development of the Zambezi Valley and is providing manpower assistance to the planning unit of the Agricultural and Technical Extension Services Department (AGRITEX) of the Ministry of Lands, Agriculture and Rural Resettlement (MLARR).
9. Much of the tsetse-infested part of the Zambezi Valley comprises national parks and safari areas (protected areas; see Map 2), for which there is no present intention to change the designated land use. Outside these protected areas, three major land use planning projects at Omay, Kanyati and the Mid-Zambezi Valley (Map 2) cover much of the area remaining infested, or immediately threatened with reinvasion, by tsetse flies. The Omay (in preparation) and Kanyati (ARDA, 1987) schemes are being funded by the EEC. The Mid-Zambezi Valley Rural Development Programme (MZVRDP) is being funded by the African Development Bank (ADF, 1986). A donor is apparently interested to finance

another large land use planning project in the Zambezi Valley to the east of the MZVRDP.

10. Traditional agro-pastoralism is likely to be an important form of future land use in all of these rural development programmes. In Zimbabwe this involves individually-farmed arable plots and communal grazing. In the present Communal Farming Areas, household arable plots average about 3 hectares, and about 80% of all households keep grazing animals including an average of about five cattle (GFA, 1987). The large majority of households have less than 12 cattle, although some have substantially more.
11. The role of cattle in the traditional farming system centres upon provision of draught power and not beef production. Animal draught power enables farmers in the Zambezi Valley to cultivate larger areas and to achieve better yields as a result of more effective and more timely ploughing (Barrett, preliminary results^{1/}) as has been reported elsewhere in Zimbabwe (Shumba, 1984). Cattle also provide milk, manure and occasionally meat for the household. As a form of rural banking, surplus animals are sold for major cash requirements and livestock are used for bridewealth. Cattle ownership provides social status and livestock have ritual functions such as the honoring of ancestors.

Appraising tsetse control in support of livestock development

12. Decisions on whether to undertake tsetse control in the Zambezi Valley in support of the introduction of cattle should be based upon economic benefit-cost analysis, using techniques which have already been applied elsewhere in Africa (e.g. Jahnke, 1974; Habtemariam, 1983; Shaw, 1987; Brandl, 1988). The direct costs of tsetse and trypanosomiasis control operations can be quantified far more easily than potential benefits and disbenefits. An adequate basis exists for estimating the effect of disease control on animal productivity and the economics of alternative land uses. But the difficulty arises in projecting over a ten to twenty year period the pattern and intensity of economic activity that is likely to develop in a project area with and without tsetse control being undertaken (Shaw, 1987). Standard techniques of sensitivity analysis provide a methodology for appraising the implications of uncertainty providing there are plausible limits to such uncertainty.
13. Implementation of tsetse control can be justified only if there is confidence that subsequent rural development will be in accordance with the land use

plans and projections on which benefit-cost analysis has been based. In many respects the level of land use planning taking place in the Zambezi Valley is high. But there may be a real danger that land use plans will not be implementable in the long run. Planners themselves appear unconvinced that they know how the marginal, semi-arid lands in this part of Zimbabwe can be used in a sustainable and economically viable way. Plans are being prepared on the basis of experience in more established farming areas of the country, experience which may prove inappropriate in the Zambezi Valley.

The key issue: overstocking and sustainability of land use

14. The Zambezi Valley has been identified as one of the areas of very high potential erosion hazard in Zimbabwe (Whitlow, 1988). To date there is little evidence that environmental degradation is more severe here than elsewhere in Zimbabwe (World Bank, 1986; Whitlow, 1988), and indeed Whitlow (1988) points out that there is a very poor correspondence between potential and actual erosion at a national level. However, he asserts that the extension of settlement in the communal lands behind a retreating tsetse-fly frontier is likely to promote widespread degradation.
15. The environmental consequences of land use change following tsetse control in the Zambezi Valley are of deep concern not only to local conservation agencies (Greaves, 1985; Anon., 1987) but also to the Veterinary Department and the EEC, who are presently funding a Regional Tsetse and Trypanosomiasis Control Programme (RTTCP) covering Zimbabwe, Zambia, Mozambique and Malawi. This project was established in 1985 following an earlier feasibility study (PTA/Minster, 1983) with a view to the possible tsetse eradication in the common fly belt covering these four countries. In 1988 two land use studies^{2/} specifically relating to the RTTCP have been funded by the European Economic Community (EEC), one of which was jointly funded by the International Union for Conservation of Nature and Natural Resources (IUCN). It is understood that while neither consultancy considered that tsetse control should be discontinued in the Zambezi Valley, both underlined the need for greater attention to land use issues.
16. One of the central concerns is that, if overstocking with cattle were to occur in the Zambezi Valley, it could result in extensive environmental degradation. Land use plans recommend carrying capacities for different categories of land but commonly these stocking levels bear little relation to what communal

farmers perceive as appropriate. Unless the difference between planned and desired cattle ownership can be reconciled, land use plans will require a level of control of communal farming which will be objectionable to farmers. Such plans may therefore prove impracticable, particularly in a political milieu where communities are being encouraged increasingly to make decisions for themselves.

17. In examining the case for and against tsetse control in support of rural development it should be borne in mind that tsetse control is not necessary to allow introduction of livestock: in much of the tsetse-infested communal areas farmers are already keeping cattle, goats and donkeys. In areas of low trypanosomiasis challenge farmers either accept the losses due to morbidity and mortality or use trypanocidal drugs on their cattle. Those areas where there are no cattle are largely areas where the Veterinary Department has prohibited cattle ownership for strategic reasons relating to animal disease control, or where trypanosomiasis challenge is very high.
18. While it cannot be argued that introduction of livestock into newly settled areas is dependent on tsetse control, it is certainly the case that removal of the tsetse fly promotes livestock production. Where there is a real concern about likely overstocking, then it may well be justified to argue against tsetse control until everything possible is being done to ensure that subsequent land use will be sustainable.
19. What is the evidence concerning the likely sustainability of traditional farming systems in the Zambezi Valley, and what are the alternatives to tsetse control in support of sustainable rural development? Sufficient consideration has not yet been given to the questions of whether overstocking will actually occur in the Zambezi Valley, and if so, what can be done about it.

Will overstocking really become a problem?

20. Perhaps carrying capacity as perceived by planners is too conservative. Several workers have questioned the 'standard' planning parameters used for estimating carrying capacity in the communal lands, suggesting that higher cattle populations may be economically justified without reaching the ecological limits of carrying capacity (for example: Sandford, 1982; Jarvis and Erickson, 1986; Scoones, 1987). Such questions merit urgent attention in the Zambezi Valley if the gap can be narrowed between the planned herd size and the number

number of livestock desired by the local people.

21. Carrying capacity could possibly be increased above present levels by the intensive production of livestock feed. Sandford (1982, page 73) has advocated this approach as generally a more appropriate policy than attempting to limit livestock numbers. Improved range management, harvesting and conservation of crop residues, and production of fodder crops could all contribute to increased carrying capacity. However, the potential impact of such measures (in particular production of fodder crops) is probably limited in the semi-arid Zambezi Valley compared with higher-rainfall areas elsewhere in Zimbabwe.
22. Even if carrying capacities can be established at levels higher than presently assessed, a tendency towards overstocking still appears likely, at least in some parts of the Valley. This may be related to the minimum herd size perceived by individual farmers as necessary in order to be self-sufficient in draught power : human population density can simply exceed the level at which there are adequate grazing resources for each household to maintain a 'self-sufficient' herd. For example, in the Gutsa communal land area in the Zambezi Valley (under the auspices of the MZVRDP), the planned settlement density for the immediate future is 5 households per sq km. The officially recommended stocking rate for grazing areas in Gutsa is in the order of 10 LUs (rather less than 20 cattle) per sq km. This allows for an average of some two livestock units (three or four cattle) per household compared with a herd size in the order of 10 cattle per household which has been suggested as appropriate for subsistence (see for example Sandford, 1982: p. 103).
23. The problem will become worse as the population of the Zambezi Valley increases in the future through natural growth, so that there will be an increasing number of households each wanting to own cattle. Population growth will also bring increasing pressure to put some of the presently designated grazing land under arable farming.

What can be done about overstocking?

24. Possible approaches which might reduce this tendency towards overstocking require urgent consideration in planning the development of the Zambezi Valley. Control of livestock numbers is generally problematic, particularly under compulsion, but village-level management of livestock numbers through grazing schemes may have an impact in appropriate circumstances (Abel and Blaikie, 1988). Social cohesiveness appears characteristically weak within the

communities of new settlement schemes and government intervention may be valuable in encouraging the formation of farmer associations concerned with livestock. Agricultural extension workers are already involved in established farming areas in assisting cattle owners groups, grazing management committees and other forms of village-level natural resources management institutions.

25. Communal grazing schemes have had varying degrees of success elsewhere in Zimbabwe (Cousins, 1987 and 1988a) but have not yet been tried in any of the areas recently freed of tsetse flies. Ideally, grazing management should be planned and implemented in anticipation of an overstocking problem rather than in response to its actual development. This should be a priority in the Zambezi Valley in view of the fragility of the environment and the severe consequences which appear likely should overstocking occur. It may prove difficult to get farmers to cooperate effectively in communal resource management before the resource is under substantial and immediate threat, but no effort should be spared in this direction.
26. Overstocking may not be directly related to the number of animals required to provide adequate draught power for a given peasant farming community but to the large proportion of the overall cattle herd which is represented by breeding and unproductive animals: typically draught animals account for 30% or less of a communal cattle herd (Danckwerts, n.d.; Sandford, 1982; GFA, 1987). The tendency towards overstocking might be stemmed by measures to reduce the size of the total herd required to sustain a given draught capability. Such measures include oxenization schemes - for example, exchange of cows for oxen or sale of trained oxen with associated equipment on a soft loan basis. Encouragement of greater use of cows for draught purposes, already in practice to some extent, is another possibility (GFA, 1987). Schemes to promote draught sharing could be considered in newly emerging settlements (Muchena, 1988). Indirectly, reduced tillage farming methods could help mitigate the draught constraint (Shumba, 1984).
27. Promotion of the sale of unproductive or surplus cattle to the Cold Storage Commission by establishment of local sales pens could be feasible in some locations. Some of the difficulties associated with the present marketing system include the high cost of the sales pens and the fact that organized sales often do not coincide with the time the farmer needs to sell. A fresh look at alternative approaches to cattle marketing in rural areas appears needed.

28. Financial disincentives such as cattle taxes, grazing fees or charges for veterinary services could encourage removal of surplus animals from individual herds but this approach is likely to prove controversial. Another approach of doubtful social acceptability is the reform of land tenure to privatize the ownership of grazing land (Cliffe, 1986).

Towards an understanding of communal livestock production

29. The possibility of adverse environmental impact following livestock development in the Zambezi Valley could be reduced substantially if due care and attention is given to livestock development planning and appropriate policies are implemented. But if they are to be effective, interventions must be planned with a thorough understanding of the role of livestock in the peasant farming system and the dynamics of traditional herds.
30. By comparison with the commercial cattle sector, the traditional livestock sector in Zimbabwe has received little study (for example see ILCA, 1986). The most relevant reports published to date include those by Danckwerts (n.d), Sandford (1982), GFA (1987) and Cousins (1987 and 1988a). Cousins (1988b) of the University of Zimbabwe's Centre for Applied Social Studies (CASS) has reviewed literature on socio-economic aspects of communal livestock production in Zimbabwe, also the subject of a recent GTZ-funded workshop organized by CASS (Masvingo, September 1988) which included significant contributions from a range of University and Government departments.
31. Zimbabwe is gradually developing a more sound knowledge base upon which to evaluate interventions in traditional livestock production, a base that should be fully exploited but which needs to be developed further. Coordination of livestock development planning could be usefully strengthened at a national level, and specifically in relation to the areas such as Omay, Kanyati and the mid-Zambezi Valley where tsetse eradication accompanies agro-pastoral development.

Alternative strategies to the introduction of cattle

32. Whatever plans are made and implemented there will still remain some risk that livestock production in the Zambezi Valley could get out of hand at a future date. Is it possible to promote settlement and agricultural development in the Zambezi Valley without tsetse control and the introduction of livestock?

Draught assistance through mechanical tillage

33. Tractors are one alternative to the introduction of cattle for the alleviation of rural draught constraints. Zimbabwe has one of the best mechanical tillage support programmes for rural farmers in Africa, partly because of the infrastructure supporting the substantial commercial farming sector.
34. Mechanical tillage services are offered to peasant farmers through the Ministry of Local Government's District Development Fund. A number of tractors have been purchased privately by individual peasant farmers or by cooperatives under credit schemes offered by the Agricultural Finance Corporation (AFC), including schemes in the Zambezi Valley (e.g. Mutimba, 1984). Some Non-Governmental Organizations have also promoted rural tractor schemes (Oxfam, Lutheran World Federation, Freedom from Hunger) including a recent project at a resettlement scheme within the tsetse belt (The Herald, 1989).
35. Foreign exchange constraints for replacement and maintenance of equipment have been steadily increasing in the recent past and this situation may deteriorate even further. With appropriate government policies, mechanical tillage could make a significant contribution to the future development of tsetse-infested agricultural lands. However, for many rural farming communities, and particularly those in more marginal areas, the economics of animal draught power remain more attractive. Furthermore, tractors are unable to provide the other benefits (milk, manure, investment) offered by cattle.
36. Mechanical tillage should be seen as a complement rather than as an alternative to animal draught power. Indeed, policies directed towards the establishment of viable mechanical tillage programmes in tsetse-free areas could be important in reducing the likelihood of overstocking with cattle and consequent environmental degradation.

Draught assistance through donkeys

37. While donkeys are susceptible to trypanosomiasis they appear able to survive and remain productive in tsetse-infested parts of Zimbabwe at higher levels of challenge than local cattle can tolerate. Introduction of donkeys may offer an alternative approach to alleviating draught constraints.
38. The use of donkeys for draught power in areas cleared of tsetse by selective

game elimination has been officially encouraged in the past (Boyt et al, 1972). When the Nembudzia area of Sebungwe was first settled in 1963, donkeys were introduced in large numbers while cattle were prohibited; it was believed at that time that donkeys were unattractive hosts for the fly, which proved not to be the case (Robertson, 1983, pages 38 and 67). Since tsetse control at that time was based on host elimination, further introduction of donkeys was subsequently prohibited.

39. In the past donkeys have also been used extensively within tsetse areas by the Tsetse and Trypanosomiasis Control Branch itself, as pack animals for field teams. These animals required prophylactic treatment with Samorin while under trypanosomiasis challenge. A disadvantage of donkeys in comparison with cattle is that they sometimes suffer adverse reaction to the curative drug Berenil (Boyt et al, 1971).
40. Today in Zimbabwe donkeys are used extensively for ploughing, transport and general draught purposes in some rural communities while elsewhere the animal is not used at all. The advantages and disadvantages of donkeys in comparison with cattle do not appear to have been fully researched in this country. As with tractors, the value of donkey draught power may be more as a complement rather than as an alternative to cattle draught power.

Wildlife utilization

41. A more radical approach to land use planning is to suggest that, in substantial areas of the Zambezi Valley, peasant farmers should not keep cattle at all but rather develop wildlife utilization as an economic activity (Martin and Taylor, 1983). A wide range of options for wildlife exploitation has already been taken up by commercial farmers in Zimbabwe, with much success (Financial Gazette, 1988).
42. The Department of National Parks and Wildlife Management, under the auspices of its Communal Areas, Management Programme for Indigenous Resources (CAMPFIRE) is promoting wildlife exploitation as a form of land use in communal areas with very low agricultural potential (Martin, 1986). This programme has relevance to much of the remaining area of the country under tsetse infestation and indeed is being taken into serious account in the major land use planning exercises underway in Omay, Kanyati and the Mid-Zambezi Valley (Map 2).

43. As yet none of the CAMPFIRE projects has been fully handed over to local management, so that their long-term technical and economic performance remains to be demonstrated. There have been few independent studies of the comparative economics of communal wildlife utilization versus traditional agro-pastoralism in Zimbabwe. Brunt et al (1986) considered that the gross returns from communal land use based on arable farming combined with wildlife exploitation were comparable with those from traditional agro-pastoralism. Principally because of environmental and foreign exchange issues, they concluded that Zimbabwe's comparative advantage lies in exploiting wildlife resources. However, they emphasized the need for a more thorough comparative study of the cattle and wildlife industries.
44. Apart from the economic aspects of wildlife utilization, socio-cultural acceptability and organizational feasibility are open to question. Will local communities recognize and respond to social benefits associated with wildlife exploitation which may be higher and more sustainable but probably longer term than the private benefits associated with cattle ownership and hunting of game? What are the prospects that village-level organizations will be able to manage wildlife resources effectively? Only time will tell.
45. The prospect of extensive, successful wildlife utilization schemes under peasant management in the Zambezi Valley would be good reason for not undertaking tsetse control in this part of Zimbabwe, providing livestock were not also to be introduced. But it is unlikely that peasant farmers would be happy to completely forego cattle ownership: indeed there may be a case for including cattle in the farming system even where wildlife exploitation is the predominant land use. Multi-species animal production systems of this type are currently being investigated in Zimbabwe under the auspices of a project funded by the Worldwide Fund for Nature (Cumming, 1988). The project will be examining the economic viability of these schemes in 1989.
46. Where wildlife utilization is the best use for land of low agricultural productivity, this will generally remain the case after tsetse control. Tsetse control and the introduction of cattle, properly managed, should not be perceived as a 'threat' to wildlife utilization where this is indeed the best economic activity and recognized as such by the local community.
47. There are however other potential conflicts between livestock and wildlife

utilization in Zimbabwe, mainly relating to government policies for control of foot-and-mouth disease. These policies are outside the scope of this paper but of considerable importance in view of Zimbabwe's beef export trade with the EEC under the Lome Convention. Closer liaison between government departments and other organizations concerned respectively with livestock and wildlife could contribute to a more unified approach to development planning in the semi-arid areas.

The basis for future policy direction

48. With or without tsetse control, development of the Zambezi Valley is likely to be rapid in the coming years, with planned and spontaneous settlement continuing in response to the high population pressures elsewhere in the country. With or without tsetse control, environmental degradation is likely to occur through deforestation, streambank cultivation, poor arable land husbandry and other forms of natural resource abuse commonly associated with peasant farming under population pressure. The fragility of the Zambezi Valley is not threatened by livestock numbers alone, but overstocking is one of the more important factors contributing to the degradation of land in the communal areas of Zimbabwe (World Bank, 1986).
49. Without tsetse control livestock will be introduced to a limited extent with drug protection against trypanosomiasis where required. Support for mechanical tillage schemes or promotion of draught donkeys could alleviate draught constraints to a limited extent. However, the standard of living of communities settling in the Valley is likely to be depressed significantly without cattle ownership.
50. Without tsetse control, there is a significant risk of future outbreak of human trypanosomiasis in this area, a risk likely to be aggravated by the introduction of cattle (MacKenzie and Boyt, 1974). The Zambezi Valley is a smouldering focus of endemic human sleeping sickness, which has not proved a problem in the past as human settlement has previously been minimal in the area.
51. With tsetse control, given that traditional farming systems are likely to be important in the future development of the Zambezi Valley, widespread introduction of livestock under proper management could make a substantial and positive contribution to rural development.

52. Where tsetse control is carried out in support of sustainable new settlement, the benefits extend not only to the new settlers in the Valley itself but also to the overpopulated Communal Lands where these people are coming from. Tsetse control can indirectly help to alleviate the population pressure in existing Communal Lands which is the fundamental cause of the environmental problems already being experienced in these areas. While the relief may be limited and short-lived, given the rapid rate of population growth, it cannot be ignored in a country where land shortage is one of the main constraints to rural development.
53. Complete abandonment of tsetse fly control in Zimbabwe would result, within a few years, in extensive reinvasion of communal and commercial farming areas in which livestock play an important role. More than 30% of the country is at risk of reinvasion (Map 1), and consequently, the Department of Veterinary Services will continue tsetse control activities in Zimbabwe for the foreseeable future. The important decision to be made concerns where to draw the holding line beyond which no further fly control will be attempted until such time, if ever, that eradication of the fly beyond the borders of neighbouring Mozambique and Zambia is in immediate prospect.
54. Land use issues in the areas of infestation are only one of the factors to be considered in deciding whether or not to eliminate the tsetse fly from a particular area. The Government is currently spending some Z\$12 million (US\$6 million) per year to defend a 600 kilometre tsetse front extending from Lake Kariba to Mozambique to the north of the Eastern Highlands. It is considered cost effective to clear the western part of the tsetse belt in Zimbabwe for the simple expediency of reducing the length of the front. This could save considerable future recurrent expenditure even if the areas cleared of the fly were to be designated for wildlife rather than livestock-related use.
55. It may also be justified to undertake tsetse control in an area where there are no direct economic benefits likely to result from change in land use, but where major reservoirs of fly infestation exist and threaten neighbouring farming areas.
56. The rate of progress and priorities for tsetse control will have to be planned taking into account all the financial, socio-economic and land use factors

relevant to each part of the tsetse fly front, considerations which are likely to change from one year to the next as development of the Zambezi Valley continues. In this context, ongoing monitoring and evaluation of the socio-economic aspects of land use in the tsetse-infested areas will be prerequisites to sound planning of future tsetse control activities in the Zambezi Valley.

57. Economic evaluation will centre on benefit-cost analysis, ensuring cost-effective deployment of resources against tsetse and trypanosomiasis, and assessing the impact of tsetse control on the economics of alternative land uses, including both agropastoralism and wildlife utilization. But the work must also extend to the identification of projects, institutional and infrastructural support, policy measures and other inputs required to promote sustainable land use following tsetse control, in particular relating to livestock development and draught assistance.

58. The building of stronger links between tsetse control policy and rural development planning has the implication that future eradication of the fly from presently infested areas is likely to be a slow and cautious process. The lessons of tsetse control in Zimbabwe should have considerable value for decision-makers in neighbouring countries and for donors who could provide the funds required to eradicate tsetse from the common fly belt a reality. Resources may be allocated inappropriately unless full, proper and continuing attention is given to the social, economic and land use issues involved.

FOOTNOTES

1. Case studies are in progress to examine the impact of livestock introduction to farming communities in the Zambezi Valley following tsetse eradication.
2. Reports not issued at the time of preparation of this report in February 1989.

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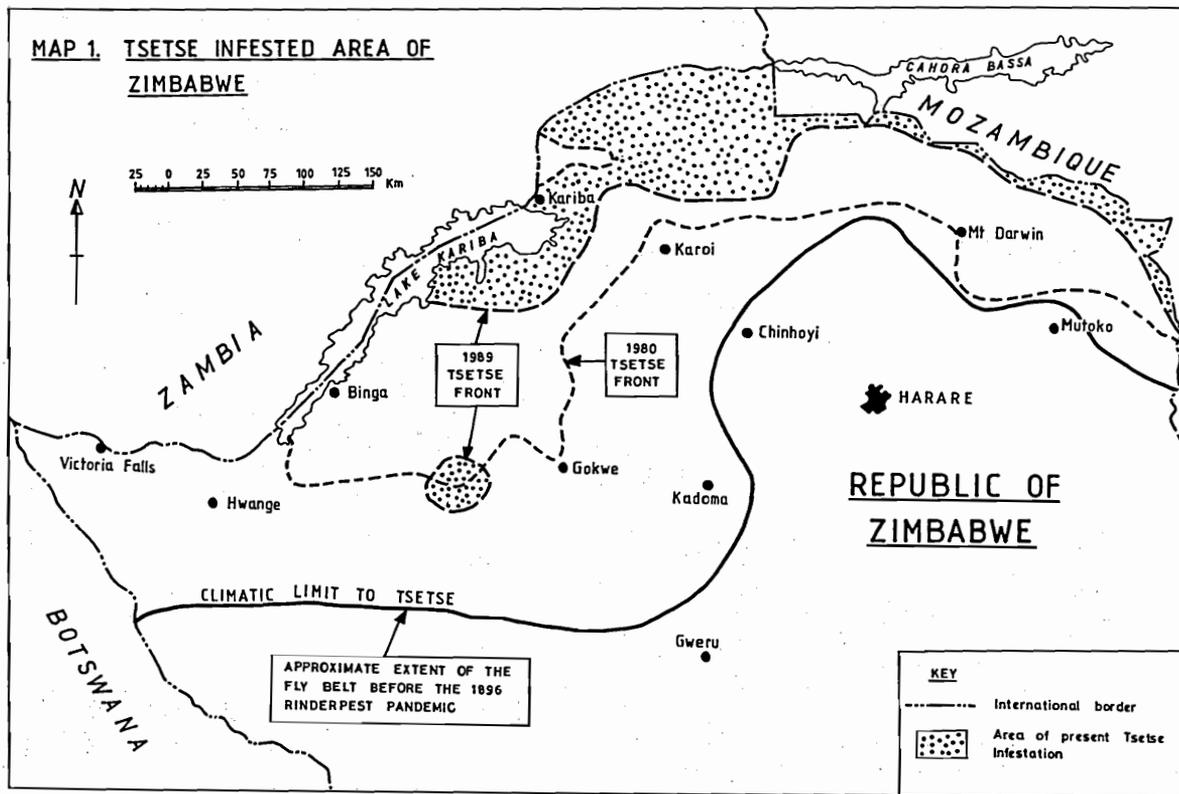
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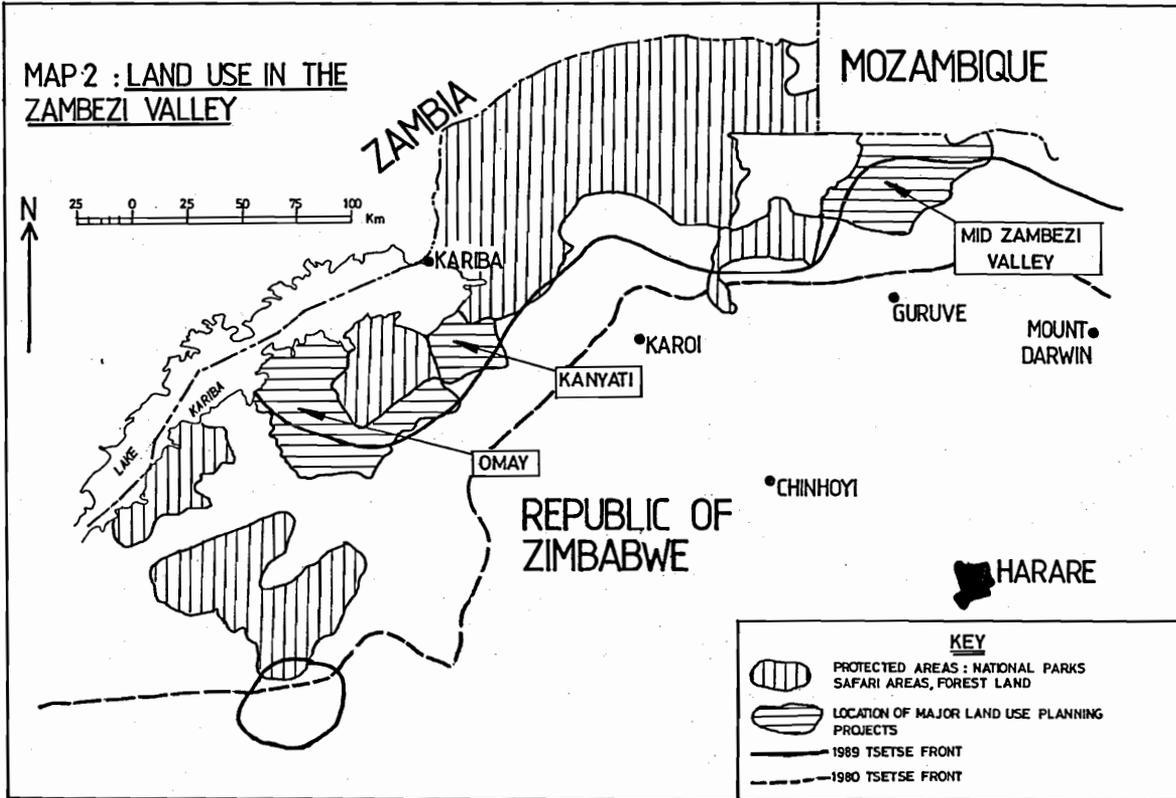
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MAP 1. TSETSE INFESTED AREA OF ZIMBABWE



MAP 2 : LAND USE IN THE
ZAMBEZI VALLEY



- KEY**
-  PROTECTED AREAS : NATIONAL PARKS
SAFARI AREAS, FOREST LAND
 -  LOCATION OF MAJOR LAND USE PLANNING
PROJECTS
 -  1989 TSETSE FRONT
 -  1980 TSETSE FRONT