

ZIMBABWE'S AGRICULTURAL REVOLUTION REVISITED

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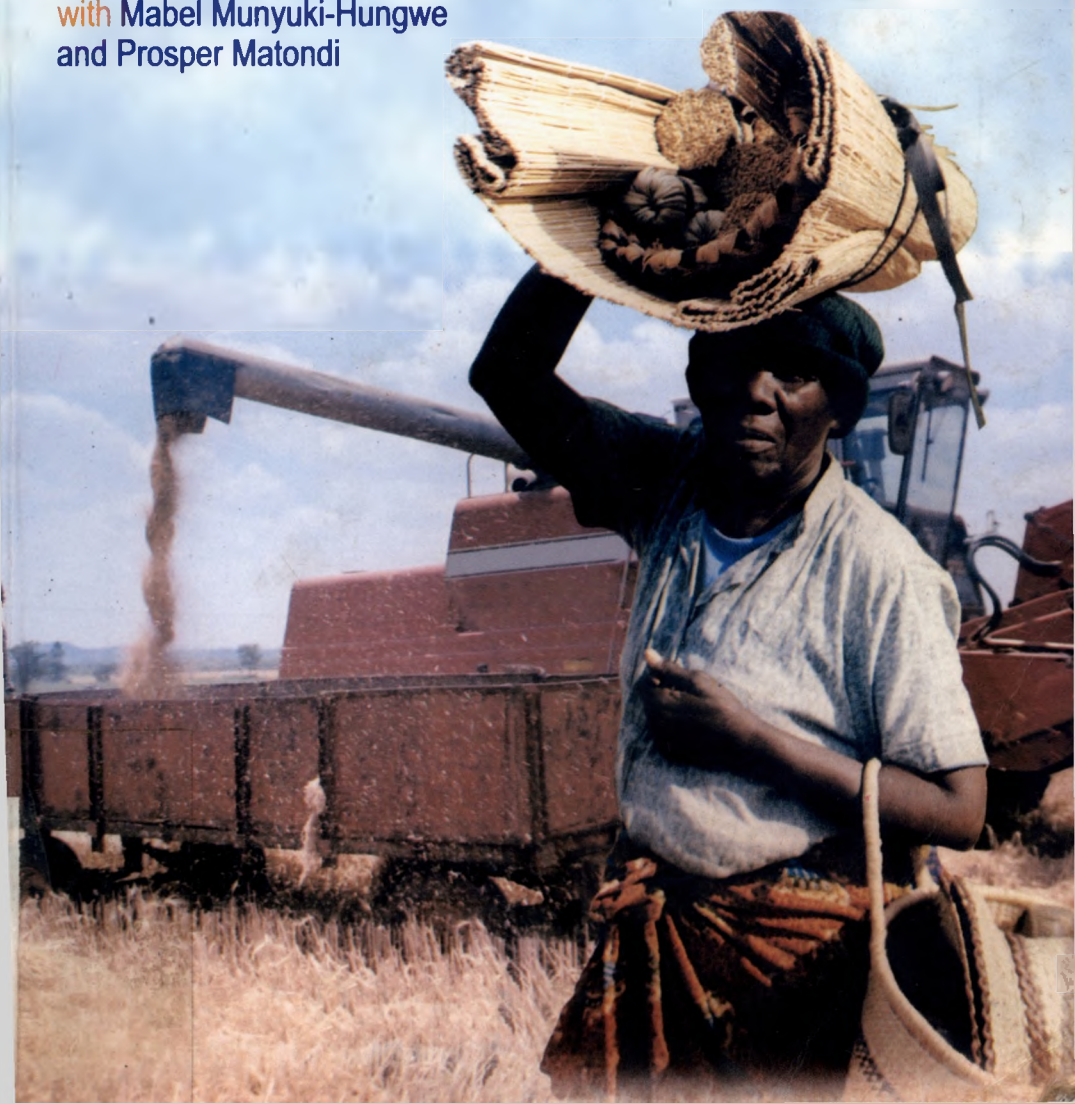
Mandivamba Rukuni,

Patrick Tawonezvi,

Carl Eicher

with Mabel Munyuki-Hungwe

and Prosper Matondi



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Mabel Munyuki-Hungwe and Prosper Matondi, 2006

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Biodiversity conservation for the future generation offers a sustainable alternative land use for the new farmers

Wildlife research and development

Ivan Bond and David H. M. Cumming

Wildlife as legitimate, viable and competitive land-use is now well established in several southern African countries. Zimbabwe played a leading and pioneering role in developing wildlife as a land-use in both commercial and communal farming sectors and by 1990 it covered 22 per cent of the country (Cumming, 1991a). By the late 1980s, the wildlife-based tourism industry was the fastest growing sector of the economy and ranked fourth in its contribution to gross domestic product. An important feature of the wildlife sector was that it generated wealth, and particularly foreign exchange earnings, from marginal lands and provided incentives to conserve the country's wildlife heritage and biodiversity.²⁰³ This is possible because, unlike meat, milk and hides, wildlife's main revenue earning products are service-based and only loosely coupled to rainfall and plant production. Importantly, extensive wildlife production systems maintain ecosystem services and retain options for future development.

Resource access rights, institutions and economic incentives are, however, complex and crucial issues in wildlife production systems. Unlike domestic animals, wild animals do not, by definition, belong to anyone until they are captured or killed. The state usually exercises rights of ownership over wildlife resources and allows for citizens to benefit from their use but with stringent controls. Consequently wild resources have always been readily appropriated by powerful élites, be they kings, chiefs or bureaucrats and large-scale commercial farmers with large landholdings. With the advent of colonial rule, access to wildlife was readily captured by the state and was protected as long as the state had the resources to do so. However, once government was either unwilling or unable to protect wildlife, it tended towards an open access resource, subject to the familiar 'tragedy of the commons' (Hardin, 1966) syndrome. The major challenge, therefore, in developing a sustainable wildlife industry is to develop appropriate institutions (laws and incentives) that both serve to protect the resource and provide incentives for sustainable harvesting.

This analysis outlines the key developments in legislation, research, in-

²⁰³ Wilderness areas are no longer viewed merely as areas of rich biodiversity for the concern of conservationists. They are now seen as commercial assets on which enterprise, investment and growth should be built for the economic and social benefit of marginalized social groups.

vestment and markets that supported the remarkable development in wildlife use and conservation between 1950 and 1995. Policy and legal change during the 1960s and 1970s, informed by ecological research, set the stage for rapid incentive and market-led growth in the industry from 1980 to 1995. Changes in policy and approach on the part of key government agencies after the 1995 elections steadily eroded the vitality of the wildlife and tourism industry and by the end of 2001 it was showing signs of collapsing. The only segments that maintained and in some cases extended their levels of production during the latter period were crocodile and ostrich farming – enterprises with minimal land requirements.

Historical background: before 1960

Epidemics of bovine pleuropneumonia during the 1850s, the great rinderpest epidemic of 1896–1897 combined with the exploitation by slave traders, hunter explorers, prospectors and adventurers left Zimbabwe and most of southern Africa with greatly depleted herds of both cattle and game. The result was that newly established colonial administrations, alarmed at the loss of once plentiful herds of wild animals, soon introduced protective and command type legislation.

The first Game Law Amendment Act of 1891 and the Game Preservation Ordinance Act of 1899 contributed to the recovery of wild herds but effectively dispossessed all (large-scale and smallholder) farmers of the right to use and benefit from wildlife on their land. As wildlife populations recovered, so did tsetse fly populations and by 1918 cattle were threatened by trypanosomiasis. Hunting to eradicate large mammals as a means of controlling the spread of tsetse fly and protecting the commercial livestock herd was introduced in 1920 and continued through to the 1970s (Child and Riney, 1987).

In Zimbabwe, the game preservation laws were replaced by the Game and Fish Preservation Act of 1929 which also provided for the establishment of the Wankie (now Hwange), Victoria Falls and Urungwe (now Hurungwe) game reserves (Cumming, 1983a). In 1938 the Act was amended to ‘give effect to the International Convention of 1933 for the Protection of the Fauna and Flora of Africa’. The amendments made additional provisions to control trade in wildlife products and movement of trophies but the provisions relating to national parks were only included later when the National Parks Act of 1949 was passed. Legislation to support development of a wildlife industry was introduced in 1961 but was only fully developed by 1975 (Cumming, 1983a).

By 1950 wildlife populations in many areas had recovered but were considered to be adversely affecting commercial cattle ranching interests by competing for grazing and harbouring diseases. Increasing wildlife/people interactions (particularly those involving elephants and livestock predators) resulted

in the appointment of a game officer in 1953 by the Department of Entomology (the agency then responsible for tsetse control) to deal with wildlife issues outside national parks. But recognition by government that wildlife was an economic asset resulted in the Department of Wildlife Conservation being created in 1957 to deal with wildlife matters outside national parks and it appointed the country's first wildlife research officers in 1958. However, tensions arose over the existence of two separate management principals for national parks and for wildlife outside national parks administered by two separate government departments. The department's brief included the designation of controlled hunting areas for sport hunting, game ranching, quelea control and Operation Noah – the rescue of animals trapped in the rising waters of Lake Kariba. A key development in 1959 was the involvement of three Fullbright scholars (Dasmann, Mossman and Riney) in examining the potential for game ranching and in initiating wildlife management research programmes in the country (Child, 1995). By now international interest in wildlife as a source of protein in Africa (Huxley, 1961) contrasted sharply with the wasteful slaughter of wildlife on cattle ranches and in tsetse control operations. The resulting tensions and controversy stimulated a crucial re-examination of the role of wildlife and wildlife conservation in Zimbabwe.

Foundations: 1960–1980

The period 1960 to 1980 was characterized by major changes in the perception of wildlife. The private sector was increasingly demanding control over wildlife in order to exploit the mounting international interest in African wildlife and the resultant demand for wildlife products and tourism. This combined with the improved knowledge and understanding of wildlife resources resulted in several innovations in policy and law (Child, 1995). Immediate changes in the sector were constrained by the effect of international sanctions and the ongoing liberation struggle that prevented Zimbabwe from becoming a major tourism destination. They were, however, crucial in providing a springboard for the wildlife industry to flourish after independence in 1980.

Legal and policy milestones

Key legal and policy developments (table 22.1) provided an enabling framework for the involvement of the private sector in wildlife management and conservation. As commercialization of wildlife and fisheries increased through the 1960s and early 1970s, so did the tensions arising from the constraints imposed on government and the wildlife sector by two outmoded Acts. The result was the development and promulgation of the innovative and farsighted Parks and Wildlife Act of 1975. The Act provided a coherent and comprehensive legal framework for managing and conserving the wildlife resource of the

Table 22.1. Major legislation and/or policy changes (1961 to 2004) and the implications for the wildlife sector

Year	Legislation or policy	Implications for the wildlife sector
1961	Wildlife Conservation Act	Designation of controlled hunting areas for sport and safari hunting and support for commercial cropping of game on ranches
1962	<ul style="list-style-type: none"> • Marketing of game meat regulations • Royal commission on tsetse fly control 	Unrealistic requirements on the slaughter and marketing of game meat (for example, presence of vet or meat inspector) which constrained development of game ranching
1964	Amalgamation of national parks and wildlife conservation departments into Department of National Parks and Wildlife Management	Unified administration of wildlife matters through the country and establishment of a wildlife research branch with a unit to service game ranching and another to research game/tsetse relationships
1965	First culling of elephants in a national park	Start of country's long-term involvement in the management of an erupting elephant population – later development of ivory carving and elephant hide tanning industries
1965	Crocodile ranching pilot schemes started	Start of National Parks and Wildlife Management and private enterprise partnership in the development of a flourishing crocodile ranching industry and recovery of Nile crocodile populations
1968	Game reserves established in communal lands	Four game reserves (Chirisa, Dande, Malipati and Ruenya) gazetted in former tribal trust lands and under control of Ministry of Internal Affairs. First attempt to provide a basis for channelling benefits from wildlife to communal land communities
1970	Appropriated commercial farms in Matetsi divided into seven safari hunting concessions	First major experiment in wildlife as a land-use in Zimbabwe that soon turned a depressed cattle ranching area into a set of profitable wildlife enterprises
1975	Parks and Wildlife Act	Act provided a coherent and comprehensive legal framework for managing and conserving the wildlife resources of Zimbabwe and particularly provision for the devolution of appropriate authority by government for wildlife to landowners or occupiers
1989–1991	16 major wildlife producing districts granted appropriate authority status	Rural district councils, wildlife producer communities and households begin to derive direct financial benefits from the management of wildlife
1995	Ministry of Natural Resources begins to recentralize control over wildlife decisions	Decisions on wildlife and wildlife management are increasingly made by the state rather than Department of National Parks and Wildlife Management
2000	Land redistribution process initiated by state	Demand for wildlife-based activities declines (tourism by 75 per cent and sport hunting by 10 per cent) Wildlife habitat in the large-scale commercial farming sector fragmented through designation for settlement and agro-pastoral activities
2004	Proposals on legal framework for wildlife	Proposal on 25-year leases for wildlife production on farms

country. The major provisions of the Act were as follows:

- 1 To confer on landholders and occupiers of alienated land the responsibility for the management and use of wildlife on their land;
- 2 To extend the definition of wildlife to include all indigenous plants and animals, both vertebrate and invertebrate;
- 3 To allow landholders and occupiers to invoke legislation to provide additional protection to wildlife on their land;
- 4 To provide for the creation of special conservation areas outside of the nationally administered parks and wildlife estates.

Contrary to popular perceptions, the Act did not confer ownership of wildlife resources on landowners. Under Roman Dutch Law, the predominant legal code in southern Africa, the legal status of wildlife is *res nullius* or *res nullis*. This means that wildlife belongs to no one. Ownership can only be exerted on an animal once it has been effectively controlled (confined), captured or killed. In terms of the Act a landowner can only exercise his right of use while the animal occupies his land. Once it moves on to a neighbouring farm he no longer has the right to kill or capture it.

What the Act did, however, was to provide incentives for landowners to manage and benefit from wildlife resources on their land without having to seek government permission. This Act and the Natural Resources Act of 1941 contained sufficient safeguards to control abuses by devolving a monitoring and caretaker role to the local and subdistrict level by forming wildlife subcommittees under the already established intensive conservation area committees.

Regrettably the privileges and principle established for the management and use of wildlife on alienated land were not extended to the communal lands in 1975 (other than to the Ministry of Internal Affairs and its designated officers). The devolution of wildlife and timber resource access rights in the communal lands has thus remained problematic. Consequently the highly visible disparities between relatively empty ranches stocked with wildlife and separated from overpopulated communal lands was an obvious source of conflicts and thus presented a microcosm of the land question (see Moyo, chapter 6).

Developments in research and training

Changes in policy and legislation and new demands of the expanding wildlife sector stimulated ecological research and training by both government and the University of Zimbabwe. Several important areas of research were initiated by the Department of National Parks and Wildlife Management during the period 1965 to 1980. These included censuring and managing elephant and other large mammal populations, carrying capacity of large mammals in African savannas, establishing sustainable quotas for trophy animals in safari hunting, capturing

and translocating large mammals, studies of animal movements using radio tracking techniques, basic biology and ecology of several important large mammal species and crocodiles, and domestication of eland and buffalo. The studies on crocodiles provided the foundation for developing the crocodile farming industry in Zimbabwe. Two research institutes were established during the early 1970s, the Sengwa Wildlife Research Institute at Sengwa and the Kariba Fisheries Research Institute at Kariba. The southern section of the Chirisa Game Reserve (later Chirisa Safari Area) formed the Sengwa wildlife research area and was the centre for continuing wildlife research under the aegis of the Department of National Parks and Wildlife Management and the University of Zimbabwe (Cumming, 1983b).

Private sector initiatives and investment

Private landholders played a key role in the initial and subsequent development of the wildlife industry. At the outset, in 1958, two large cattle ranches, Buffalo Range near Chiredzi and Doddieburn-Manyoli near West Nicholson, divided their ranches into cattle and wildlife operations. Several other ranchers ran mixed cattle and wildlife operations. By 1964 there were 40 active game ranches in the country with 50 registered game ranchers (Cumming, 1991b). Unrealistic veterinary and hygiene controls on the harvesting and marketing of wildlife products, coupled with subsidized commercial cattle production, served to undermine the development of viable game ranching enterprises. It was not until some wildlife ranches diversified into commercial safari hunting and developed and marketed mini-safaris that wildlife became a viable alternative to beef production (Cumming, 1989). Closure of trophy hunting in Kenya, the epicentre of the classic African safari popularized by Theodore Roosevelt and Ernest Hemingway, stimulated the rapid development of the hunting safari industry in southern Africa, particularly in Botswana and Zimbabwe, which were well poised to absorb the demand.

Development and growth of a wildlife industry: 1980–1995

Access to wild land is a requirement for a flourishing wildlife industry. The parks and wildlife estates of Zimbabwe, covering some 12 per cent of the country, formed a secure core for the industry. However, the conservation of wildlife outside these core areas required landholders and land managers to have access to wild land and to directly benefit from wildlife. This could only be achieved in both alienated and communal lands where the returns to the landowner or occupier from wildlife or tourism, or both, were greater than they would be from alternative uses of that land. In order for that to happen, appropriate policies and incentives are necessary as is the removal of perverse incentives and subsidies.

Production systems and indicators of growth

By 1990, a dynamic and diverse wildlife sector emerged in Zimbabwe with three broad classes of production:

- 1 *Intensive single species systems*: Both crocodiles and ostriches were produced in captivity for their leather with meat as a by-product. The semi-industrial approaches developed meant that these units were land, capital and management intensive.
- 2 *Semi-intensive multi-species systems*: Semi-intensive multi-species systems evolved on the private land mainly adjacent to urban centres. These enterprises were developed to take advantage of the domestic tourism market (educational tours and urban tourists) and the rapidly developing live-animal markets of the early 1990s (Bond, 1992). Typically these enterprises were developed on unused or underused sections of private land.
- 3 *Extensive multi-species systems*: Extensive multi-species production of either cattle and wildlife or wildlife alone were typically developed in the semi-arid areas of the country (natural regions IV and V) on both alienated and communal lands (through the Communal Area Management Programme for Indigenous Resources – CAMPFIRE). In both tenure systems the major sources of income continued to be from safari hunting.

In parallel with the development of the core wildlife production systems, numerous secondary industries developed to service the wildlife sector, such as taxidermists, wildlife capture units, and goods and service providers for tourism. By the mid-1990s one of the largest sectors of employment was the production and sale of wood carvings to tourists (Braedt and Gunda, 2000). Many smallholders became these service providers because they did not have access to land on which to venture into wildlife production. Lack of land rights tended to reinforce the dual economic development.

Markets for wildlife products and services

While less directly dependent on primary rangeland production than livestock, it has been argued that extensive wildlife producers are exposed to the vagaries of the market for wildlife products (Barrett and Arcese, 1995). Wildlife-based tourism which encompasses both safari hunting and photographic tourism, including boat trips, bird watching and visits to cultural sites, are luxury products with a high income elasticity. Similarly, intensive single-species production units are producing hides primarily for the international fashion industry. Exporting wildlife and meat is also a critical aspect of the industry.

For Zimbabwe, the number of in-bound tourists is determined primarily by domestic, social, economic and political stability, rather than changes in disposable income in the major source markets (Heath, 1990). As a result of the stable political situation between 1987 and 1997, the annual number of visitors

increased to over one million of whom approximately 13 per cent were from the Organization for Economic Cooperation and Development member countries. This stimulated investment in tourism and between 1980 and 1994, the total beds available increased by 63 per cent while employment in the sector was estimated to have increased to over 36,500 people (Bond, 1999). At the time, tourism was considered the fastest growing sector of the economy with the potential to become a major force for economic development (Muir and Bojo, 1994). The state's protected area system and liberal attitude were crucial to facilitating the development of wildlife-based tourism. This enlightened approach to the development of wildlife tourism provided a strong foundation from which it could expand into both the large-scale and the communal farming sectors.

Successful wildlife-based (non-consumptive) tourism requires, amongst other conditions, that the destination has either exotic or photographic appeal (Murphree, 2001). Typically, the prime tourism destinations in southern Africa are characterized by opportunities to observe and readily photograph a wide range of large mammals. In contrast, trophy hunting can be developed at significantly lower wildlife population densities. Furthermore the development of trophy hunting generally required much lower levels of capital investment. Consequently, it is often the entry point for wildlife producers into the market (Child, 2001). In Zimbabwe, this is reflected in the gross earnings from international safari hunting which increased from US\$2 million in 1984 to US\$22 million in 1998.

Since 1997, Zimbabwe has become increasingly perceived as a risky destination for tourists. Following the violence associated with the 2000 parliamentary and the 2002 presidential elections and the occupation of large-scale commercial sector farms, there has been a massive decline in the number of visitors to Zimbabwe. The safari hunting market appeared to be more resistant to political instability. In 2000, the gross value of the industry declined by only 10 per cent compared with the 75 per cent fall in tourists (Booth, forthcoming). This substantiates the long-held proposition that sport-hunters are less risk averse than tourists (Muir and Bojo, 1994).

The development of crocodile and ostrich farming

Intensive production and management of wild species, often with a view to domestication, has been tried on several African antelope species but with limited success. However, the rearing and farming of crocodiles and ostriches in Zimbabwe has been an economic success. Crocodile and ostrich are less land consuming than wildlife in general and do not require prime land. Because of a real scale production they tend to have higher financial returns per unit of land.

In both cases the hides were the major, high-value products initially, with meat production for ostriches following later. A key factor in the development

of both crocodile and ostrich farming has been the research carried out by Department of National Parks and Wildlife Management and particularly the Veterinary Wildlife Research Unit in the Department of Veterinary Services. The early formation of a Crocodile Producers' Association and the Ostrich Producers' Association of Zimbabwe and careful attention by these associations to markets and marketing and quality of products made for rapid progress.

The Nile crocodile was not protected before 1961. Unsustainable use including exports of live wild populations resulted in a drastic reduction in the species both within Zimbabwe and elsewhere on the continent. The result was that the species was placed on Convention for Trade in Endangered Species (CITES) Appendix 1 and international trade in skins was banned. The Department of National Parks and Wildlife Management established a crocodile-rearing scheme with four interested parties in 1965 where eggs from the wild were harvested, incubated and hatched under artificial conditions and the young crocodiles reared for slaughter. The department required that a percentage of the reared crocodiles be returned to the wild to boost wild populations. Under the careful control of the department and regularly monitored and reviewed CITES quotas, the skins of ranched crocodiles were exported to Europe. The scheme, coupled with protection of wild populations, resulted in a spectacular recovery of wild crocodile populations in Zimbabwe and, after the lengthy carefully controlled trial period, rapid growth in crocodile farming and export of hides (Blake and Loveridge, 1975).

Incentives for wildlife in the large-scale commercial farming sector

Security of tenure was a necessary but not sufficient condition for the management of wildlife by farmers in the large-scale commercial farming sector (Child and Chitsike, 2001). During the 1990s, however, changing macro-economic conditions and the strong demand for wildlife changed the incentive structure so that farmers increasingly began to allocate resources to the management of wildlife (Child, 1988). A survey in 1990/91 (Jansen, Child and Bond, 1992) showed that the average financial return on investment of wildlife enterprises increased from natural region III to natural region V. Only in natural region V, however, did the average return on investment across all ranches exceed 10 per cent, the level considered profitable by the survey. The reasons for increasing profitability of wildlife production systems with increasing aridity were not clear and needs further investigation. Conversely, the average return on investment to cattle was below 5 per cent in all natural regions (Bond, 1993). The significant changes in land-use, where ranchers have de-stocked cattle in favour of wildlife during the period 1990 to 2000, have fully substantiated the results of the survey. The most significant indicator of the relative viability of wildlife and livestock production systems was the formation of wildlife conservancies such as Save Valley, Bubianna and Chiredzi River (Price Waterhouse, 1994).

Incentives for wildlife as a land-use in the communal farming sector

The creation of game reserves in 1968 was intended to provide benefits to surrounding communities and the return of funds from hunting concessions through the district development fund for community projects but they did not involve communities in managing their natural resources. The Wildlife Industries New Development for All (WINDFALL) project (in the late 1970s) which returned meat to surrounding villages and revenue from elephant culls in Chirisa to the district council was similarly deficient. The development of the Sebungwe regional land-use plan involved a full range of government agencies but not people from the region. The failure of these efforts stimulated a reassessment of approaches to community involvement in wildlife management. The reassessment of communal wildlife production resulted in the development of the Communal Area Management Programme for Indigenous Resources (CAMPFIRE). The primary objective of CAMPFIRE was to establish functional common-pool institutions for the management of wildlife and wildlife habitat in the communal lands of Zimbabwe (Martin, 1986). The CAMPFIRE programme had strong financial backing from donors, particularly the United States Agency for International Development. Despite the development of CAMPFIRE as a concept, it was not until 1989 that the Ministry of Natural Resources granted authority to two district councils to manage wildlife. By 2004, 46 rural district councils had appropriate authority to manage wildlife and wildlife habitat, although only 16 rural district councils had a regular source of income from the use of large mammals.

Central to CAMPFIRE and common to all regional community-based natural resource management programmes is the role of economic incentives for institutional change for the management of wildlife and wildlife habitat. It has been proposed that institutional change will only take place when the net benefits of the new institution are much greater than the net benefits of the old institutions (or lack of institutions) which they seek to replace (Ostrum, 1998). Thus for wildlife to be a viable land-use option in the communal lands of Zimbabwe, the net benefits of allocating land to wildlife and managing it, should significantly exceed the previous institutional arrangements. Focusing on the process of institutional change rather than the viability of wildlife emphasizes the common pool nature of the problem.

Between 1989 and 1999, rural district councils earned a total of US\$15.87 million from wildlife-based activities (table 22.2), including 89 per cent from leases with private sector safari operators, 6 per cent from the sale of hides and ivory, 5 per cent from a combination of photographic tourism leases (2 per cent) and miscellaneous activities. Of the revenue earned from safari hunting, at least 60 per cent can be attributed to elephant (Bond, 1999). The development of photographic tourism within the communal lands has been constrained by the fragmented nature of most of the wildlife habitat and, relative to the

protected areas of Zimbabwe, low wildlife population densities.

Wildlife revenue is allocated annually, in arrears, to wildlife producer wards, wildlife management activities and to a rural district council levy. In 1991, as a response to highly variable subdistrict allocations by district councils, the Department of National Parks and Wildlife Management issued the *CAMPFIRE guidelines*. These recommended that at least 50 per cent of wildlife revenues was to be allocated to producer wards, up to 35 per cent should be retained by the rural district council for wildlife-specific activities and 15 per cent could be appropriated by the council for general revenues (Department of National Parks and Wildlife Management, 1991). At a national level, the guidelines have been largely implemented (table 22.3). At district level, however, the disbursements of wildlife revenue have been characterized by a high degree of variability both within and between districts. This has led to the conclusion that the weak and unenforceable policy framework is allowing rural district councils to control and allocate wildlife revenue to the exclusion of local communities' involvement (Bond, 1999).

Assuming the conditions for institutional change (Ostrum, 1998), the most important indicator of the incentives created by CAMPFIRE is the gross annual benefit per household. Typically, the benefits were highly skewed and in general very low. Between 1995 and 1999 the median benefit per household varied between US\$2.2 in 1998 (range US\$0.18 to US\$252.30; n = 86) and US\$5.8 in 1999 (range US\$0.16 to US\$197.53; n = 100). Comparisons of gross

Table 22.2. Income earned by rural district councils with appropriate authority between 1989 and 1999

	Safari hunting	Tourism	Hides and ivory	Other	Total
Income (US\$ million) by activity	14.1	0.37	0.94	0.46	15.87
% of income by activity	89	2	6	3	100

Source: WWF-SARPO

Table 22.3 The allocation of wildlife revenue earned by rural district councils: 1989 to 1999

	Producer wards	Wildlife management	Council levy	Other and not recorded	Total
Revenue allocated to	8.0	3.2	1.6	3.0	15.8
% of total revenue allocated	50	21	9	20	100

Source: WWF-SARPO

household benefits with agricultural production showed that in most wards the income from wildlife was purely supplementary to crop and livestock production (Bond, 1999; Logan and Mosely, 2001). The low benefits earned from wildlife were a function of both biophysical and institutional factors. Within CAMPFIRE only a handful of wards could produce significant annual household benefits due to their low human population densities. Institutionally, producer wards were constrained by the opportunistic attitudes of rural district councils towards wildlife revenue (Bond, 1999).

Given this analysis, it followed that CAMPFIRE was unlikely to achieve widespread institutional change for the management of wildlife and wildlife habitat. There were, however, local exceptions where the direct benefits from wildlife production were very high. In these wards, there were tangible changes in attitudes to wildlife, substantial local-level investment in the management of wildlife and locally initiated land-use planning in support of wildlife production (for example, Kanyurira ward, Guruve rural district council and Mahenye ward, Chipinge rural district council). The revenues generated by rural people's resource management and ecotourism efforts were received by the rural district councils which had considerable discretion as to how much money to pass on to the local level. This reduced the programme's effectiveness in the long run.

Post-independence research, development and policy failure

Investment in wildlife research compared with that in agricultural research in Zimbabwe has been remarkably low. Over the last two decades, however, the significant changes and progress in Zimbabwe's wildlife sector have provided a wide range of research opportunities to both local and foreign scholars. Locally initiated research projects have been conducted by a wide variety of academic and non-governmental organizations, including most members of the CAMPFIRE collaborative group.²⁰⁴ Internationally initiated research projects have generally adopted a comparative approach to lessons learned from CAMPFIRE and other regional community-based natural resource management programmes. Common to many of the research initiatives and projects are the methodological problems due to the complexity of the community-based natural resource management processes, which makes determining causality very

²⁰⁴ The CAMPFIRE collaborative group was a loose affiliation between the organizations implementing CAMPFIRE. Originally convened by the Department of National Parks and Wildlife Management, the group was headed by the Campfire Association from 1992. The group included, among others, the Campfire Association, Department of National Parks and Wildlife Management, Centre for Applied Social Sciences, Zimbabwe Trust, Africa Resources Trust and Action.

difficult. In addition many of these studies have suffered from spatially and temporally limited data sets.

In the first decade after independence, government agencies, particularly the research branch of the Department of National Parks and Wildlife Management and the Department of Veterinary Services, continued to lead wildlife-based research and development. Along with private sector partners they were responsible for many of the technological advances which stimulated the development of the ostrich and crocodile industries. In particular, large mammal research conducted within the Department of National Parks and Wildlife Management, continued to influence wildlife management decisions within the parks and wildlife estates (for example elephant management and reduction programmes). This maintained the cohesiveness between research and policy developed by Department of National Parks and Wildlife Management before 1980 (Child, 1995). This relationship reached a watershed in 1989 when CITES upgraded all African elephant populations to Appendix 1. By restricting elephant management options for the Department of National Parks and Wildlife Management, CITES contributed to reducing the department's influence on wildlife policy which in turn paved the way for the recentralization of wildlife matters by the Minister and the Ministry of Environment and Tourism in 1995. This was in line with government's objectives of exerting greater control over the wildlife sector and its stakeholders.

After 1990, the focus of wildlife-based research and the principal actors changed significantly. A movement towards participatory research in the 1990s provided space for community-grounded organizations to take the lead. Previously most of the applied research had been carried out by government agencies. After 1990, the socio-economic variables became the focus of the research effort. The research was conducted mostly by non-governmental organizations and academic institutes, albeit under nominal supervision of the Department of National Parks and Wildlife Management. The new direction of the research was fully justified by the need to understand and develop effective policies for wildlife and natural resource management in the communal lands. In contrast, however, with the close relationship between research and policy before 1990, the last decade has been characterized by an increasingly dysfunctional relationship. The result has been that recommendations derived from the investment in research appear to have had little or no impact on wildlife and natural resource policy. These themes and their possible causes are investigated below within the context of the opportunities that have been forgone by the wildlife sector.

In the large-scale commercial farming sector, despite the evidence from the changes made by landholders and predicted by research (Price Waterhouse, 1994; Jansen *et al.*, 1992; Child, 1988), wildlife as a land-use failed to achieve legitimacy within many sectors of government, the general public and the rul-

ing élite. This has been attributed to the highly inequitable allocation of land in Zimbabwe between the commercial and communal farming sectors, the dominance of the wildlife sector by white entrepreneurs and the perceived conflict between agriculture and wildlife as a land-use (Hill, 1993).

Wildlife as a land-use and the racial allocation of land are inseparable issues. The state has argued that wildlife production which requires large blocks of contiguous land is essentially incompatible with land reform. There has also been a suspicion that large-scale commercial farmers have used wildlife as a land-use ploy so as to be seen as making full use of their land, thereby avoiding compulsory acquisition for resettlement. Closely related to the land issues has been the dominance of the wildlife sector by white Zimbabwean entrepreneurs and the support by donors that this elicited. This has publicly been identified as a problem which needed to be resolved. Finally, it appears that wildlife has not achieved legitimacy, largely because of the intangible nature of its products which, it is argued, compromise national food security. The current and highly politicized nature of the land-use debate appears to consider only cultivated land as fully used. Consequently, it fails to recognize the value of ecological services and option values that are inherent in undisturbed natural habitats. It is possible but highly improbable that alternative research methodologies such as green accounting would have had any influence on the policy environment.

It is important to recognize that wildlife as a land-use in the commercial farming sector had some support from within government. From 1961 the Department of National Parks and Wildlife Management had made wildlife from state-protected areas available to wildlife producers as a 'conservation measure' (Child, 1995). After independence, the role of the Department of National Parks and Wildlife Management was critical in promoting wildlife production as well as wildlife as a land-use. The Department of National Parks and Wildlife Management played a critical role in the formation of lowveld conservancies through the provision of live animals for restocking (du Toit, 1999). During droughts, the state also allowed the transfer of wildlife to some conservancies with water and fodder. By 1995, in line with political processes, the support from Department of National Parks and Wildlife Management to the wildlife sector had started to erode.²⁰⁵

In April 2000, the redistribution of land in Zimbabwe entered a new phase with a constitutional amendment which allowed government to compensate large-scale commercial farmers for land improvements only. Concurrently the state supported and subsequently legitimized land occupations as part of the

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redistribution process. This legislation, together with legislation which restricts farm sizes to 2,000 hectares in some natural regions, has placed the future of the wildlife sector on private land in serious jeopardy. Ironically, however, it is those ranchers who were involved in wildlife as a land-use who pursued the most innovative and creative mechanisms for addressing equity issues between themselves, their communal land neighbours and black Zimbabwean entrepreneurs. Their capacity to enter into dialogue was facilitated by the cohesiveness resulting from common pool approaches to wildlife management through the formation of wildlife conservancies. This was supported by the various baseline research projects conducted by non-governmental organizations, the private sector and the conservancies themselves. The future economic and ecological contribution of wildlife as a land-use in the large-scale commercial farming sector depends on the evolution of political attitudes to land ownership, wildlife and the success of local-level initiatives towards addressing resource ownership and participation in the wildlife sector.

The effort made and the resultant body of research that has been carried out under CAMPFIRE and on natural resource management in the communal lands of Zimbabwe far exceeds similar work in the large-scale commercial farming sector. This reflects the growing natural resource crisis in the communal lands and the interest generated by CAMPFIRE. This effort has considerably advanced the state of knowledge of both natural resource management and the implementation of CAMPFIRE and other community-based natural resource management initiatives (Hulme and Murphree, 2001). In Zimbabwe, case studies and cross-sectional research projects have shown that wildlife use can be an appropriate and economically viable form of land-use for communal land residents (Murindagomo, 1997). The incentive structure however at household level is constrained by high human populations, limited and fragmented wildlife habitats and, crucially, the financially opportunistic role of rural district councils (Bond, 1999). Further, the mismatch of what communities obtain and the huge foreign currency generated which benefits private entrepreneurs remains a sore point for communities. This has led Murphree (1997) to observe that CAMPFIRE's greatest contribution has been to expose communal land farmers to the possibilities that might exist under full and genuine devolution. The overwhelming conclusion of the research effort to date, however, has been that major institutional changes are required if CAMPFIRE and wildlife as a land-use are to remain viable.

There is widespread agreement that further devolution of appropriate authority to subdistrict units is urgently needed. However, in parallel with the processes that have eroded the legitimacy of wildlife as a land-use in the large-scale commercial farming sector, the state and rural district councils have steadfastly refused to consider further devolution of appropriate authority. It could be argued that over the last ten years, the state has failed to enforce the original

conditions under which appropriate authority was transferred to rural district councils. It is therefore a paradox that while research has contributed significantly to society's understanding of land and natural resource management in the communal lands, it has failed to achieve the fundamental policy changes required by CAMPFIRE for long-term viability.

Some of the reasons advanced for the loss of legitimacy of wildlife as a land-use in the commercial farming sector might equally apply to CAMPFIRE. As in the large-scale commercial farming sector, the benefits of wildlife production are largely invisible compared with conventional agricultural production. The industry is highly dependent on international markets which local communities have no access to. Thus, middle persons tend to benefit more. However, using a corporatist model of policy making, Hill (1993) shows how African states use conservation together with all other policy instruments to 'extend and establish their own interest'. Thus in the Zimbabwean context, further devolution and the concomitant decrease in state control, have not happened under CAMPFIRE because it is a direct contradiction of the state's own objectives. The importance of the 'strategic compromise' which allowed CAMPFIRE to start has been discussed by Murphree (1997). It can however be argued that the compromise actually represented the short to medium term limits on meaningful decentralization and that no further devolution is likely in the near future. The reluctance of the state can be seen in many other facets of land and natural resource legislation such as the limited one-year permits granted to the former model A resettlement farmers or the maintenance of pre-independence legislation for forestry management in the communal lands.

One exception has been the changes to quota setting which have been achieved by World Wide Fund's support to the CAMPFIRE project (1994–2001). The project used a highly participatory approach to develop a new way of quota setting. The new process, which now starts from the producer ward level and works upward (Taylor, 2001), is one of the few, albeit major, institutional changes achieved over the last ten years.

The land reform process has had several important effects on CAMPFIRE. Firstly, the effective destruction of institutions for the control of land and natural resources in the large-scale commercial farming sector has been mirrored in the communal farming sector. This has severely undermined some of the evolving institutions for the control and management of wildlife and wildlife habitat. The demand for land created by deindustrialization and movement of people (labourers) off large-scale commercial farms has exacerbated the situation. Consequently, wildlife habitat is now under greater pressure than at any time since the start of CAMPFIRE. Secondly, the land reform process has focused society's attention on the large-scale commercial farming sector. This has reduced the attention that is needed to resolve or address the ongoing land and natural resource problems within the communal areas.

Decline and loss of institutional memory

The ideas and policies adopted by Zimbabwe between 1960 and 1995 had a major influence internationally and in southern Africa, particularly in the development of community-based natural resource management in the region. The result is that between 1996 and 2000 the area of land under wildlife expanded in Namibia, Mozambique and Zambia by approximately 10 per cent (40 per cent in Namibia). In contrast to the regional trend the land under wildlife in Zimbabwe declined by 5 per cent during the same period (Cumming, unpublished data). The decline during 2001 was even greater and will require detailed field data to ascertain. While intensive production systems continued to grow after 1997, semi-intensive and extensive wildlife production systems declined after the 2000 general election.

Declining growth followed by actual declines can be traced back to 1995 and to changes in the application of policy and law following the 1995 general election. With the appointment of a new minister in mid-1995 drastic changes were made in senior staff positions in the Ministry of the Environment and Tourism and the Department of National Parks and Wildlife Management. Institutional memory was lost and decisions were no longer informed by research and monitoring; they were centralized and based on the interests of a few rather than the welfare of the resource and a once flourishing and sustainable industry.

The overall pattern of growth and decline in the Zimbabwe wildlife industry follows the path, quite closely, of that expected under a command and control system described so clearly by Holling and Meffe (1996) in their paper aptly entitled 'Command and control and the pathology of natural resource management'. Inevitably, new opportunities will arise out of the current land reform process. If, however, the lessons of the last 25 years are not appreciated and acted upon, then these opportunities too will be wasted. Therefore, for the maintenance of wildlife as a land-use option, it is essential that new policy options are explored in which farmers and communities are granted secure and tradeable rights over wildlife and wildlife habitat. In the communal sector, the knowledge gained and the fledgling subdistrict institutions already developed for the management of wildlife must be secured and used. Using this base, policies that further devolve appropriate authority must be considered at a level below the rural district councils. The recovery of wildlife-based tourism will, as in the 1980s, depend on leadership from government and effective and timely use of research. In this respect, government must return to a policy whereby it facilitates the development of all wildlife production systems. Failure to adopt a proactive approach will result in protected areas becoming isolated islands of resource abundance. The pressure on these areas will be too great to ensure their integrity and eventually wildlife-based tourism will wither.

increased to over one million of whom approximately 13 per cent were from the Organization for Economic Cooperation and Development member countries. This stimulated investment in tourism and between 1980 and 1994, the total beds available increased by 63 per cent while employment in the sector was estimated to have increased to over 36,500 people (Bond, 1999). At the time, tourism was considered the fastest growing sector of the economy with the potential to become a major force for economic development (Muir and Bojo, 1994). The state's protected area system and liberal attitude were crucial to facilitating the development of wildlife-based tourism. This enlightened approach to the development of wildlife tourism provided a strong foundation from which it could expand into both the large-scale and the communal farming sectors.

Successful wildlife-based (non-consumptive) tourism requires, amongst other conditions, that the destination has either exotic or photographic appeal (Murphree, 2001). Typically, the prime tourism destinations in southern Africa are characterized by opportunities to observe and readily photograph a wide range of large mammals. In contrast, trophy hunting can be developed at significantly lower wildlife population densities. Furthermore the development of trophy hunting generally required much lower levels of capital investment. Consequently, it is often the entry point for wildlife producers into the market (Child, 2001). In Zimbabwe, this is reflected in the gross earnings from international safari hunting which increased from US\$2 million in 1984 to US\$22 million in 1998.

Since 1997, Zimbabwe has become increasingly perceived as a risky destination for tourists. Following the violence associated with the 2000 parliamentary and the 2002 presidential elections and the occupation of large-scale commercial sector farms, there has been a massive decline in the number of visitors to Zimbabwe. The safari hunting market appeared to be more resistant to political instability. In 2000, the gross value of the industry declined by only 10 per cent compared with the 75 per cent fall in tourists (Booth, forthcoming). This substantiates the long-held proposition that sport-hunters are less risk averse than tourists (Muir and Bojo, 1994).

The development of crocodile and ostrich farming

Intensive production and management of wild species, often with a view to domestication, has been tried on several African antelope species but with limited success. However, the rearing and farming of crocodiles and ostriches in Zimbabwe has been an economic success. Crocodile and ostrich are less land consuming than wildlife in general and do not require prime land. Because of a real scale production they tend to have higher financial returns per unit of land.

In both cases the hides were the major, high-value products initially, with meat production for ostriches following later. A key factor in the development

of both crocodile and ostrich farming has been the research carried out by Department of National Parks and Wildlife Management and particularly the Veterinary Wildlife Research Unit in the Department of Veterinary Services. The early formation of a Crocodile Producers' Association and the Ostrich Producers' Association of Zimbabwe and careful attention by these associations to markets and marketing and quality of products made for rapid progress.

The Nile crocodile was not protected before 1961. Unsustainable use including exports of live wild populations resulted in a drastic reduction in the species both within Zimbabwe and elsewhere on the continent. The result was that the species was placed on Convention for Trade in Endangered Species (CITES) Appendix 1 and international trade in skins was banned. The Department of National Parks and Wildlife Management established a crocodile-rearing scheme with four interested parties in 1965 where eggs from the wild were harvested, incubated and hatched under artificial conditions and the young crocodiles reared for slaughter. The department required that a percentage of the reared crocodiles be returned to the wild to boost wild populations. Under the careful control of the department and regularly monitored and reviewed CITES quotas, the skins of ranched crocodiles were exported to Europe. The scheme, coupled with protection of wild populations, resulted in a spectacular recovery of wild crocodile populations in Zimbabwe and, after the lengthy carefully controlled trial period, rapid growth in crocodile farming and export of hides (Blake and Loveridge, 1975).

Incentives for wildlife in the large-scale commercial farming sector

Security of tenure was a necessary but not sufficient condition for the management of wildlife by farmers in the large-scale commercial farming sector (Child and Chitsike, 2001). During the 1990s, however, changing macro-economic conditions and the strong demand for wildlife changed the incentive structure so that farmers increasingly began to allocate resources to the management of wildlife (Child, 1988). A survey in 1990/91 (Jansen, Child and Bond, 1992) showed that the average financial return on investment of wildlife enterprises increased from natural region III to natural region V. Only in natural region V, however, did the average return on investment across all ranches exceed 10 per cent, the level considered profitable by the survey. The reasons for increasing profitability of wildlife production systems with increasing aridity were not clear and needs further investigation. Conversely, the average return on investment to cattle was below 5 per cent in all natural regions (Bond, 1993). The significant changes in land-use, where ranchers have de-stocked cattle in favour of wildlife during the period 1990 to 2000, have fully substantiated the results of the survey. The most significant indicator of the relative viability of wildlife and livestock production systems was the formation of wildlife conservancies such as Save Valley, Bubianna and Chiredzi River (Price Waterhouse, 1994).

Incentives for wildlife as a land-use in the communal farming sector

The creation of game reserves in 1968 was intended to provide benefits to surrounding communities and the return of funds from hunting concessions through the district development fund for community projects but they did not involve communities in managing their natural resources. The Wildlife Industries New Development for All (WINDFALL) project (in the late 1970s) which returned meat to surrounding villages and revenue from elephant culls in Chirisa to the district council was similarly deficient. The development of the Sebungwe regional land-use plan involved a full range of government agencies but not people from the region. The failure of these efforts stimulated a reassessment of approaches to community involvement in wildlife management. The reassessment of communal wildlife production resulted in the development of the Communal Area Management Programme for Indigenous Resources (CAMPFIRE). The primary objective of CAMPFIRE was to establish functional common-pool institutions for the management of wildlife and wildlife habitat in the communal lands of Zimbabwe (Martin, 1986). The CAMPFIRE programme had strong financial backing from donors, particularly the United States Agency for International Development. Despite the development of CAMPFIRE as a concept, it was not until 1989 that the Ministry of Natural Resources granted authority to two district councils to manage wildlife. By 2004, 46 rural district councils had appropriate authority to manage wildlife and wildlife habitat, although only 16 rural district councils had a regular source of income from the use of large mammals.

Central to CAMPFIRE and common to all regional community-based natural resource management programmes is the role of economic incentives for institutional change for the management of wildlife and wildlife habitat. It has been proposed that institutional change will only take place when the net benefits of the new institution are much greater than the net benefits of the old institutions (or lack of institutions) which they seek to replace (Ostrum, 1998). Thus for wildlife to be a viable land-use option in the communal lands of Zimbabwe, the net benefits of allocating land to wildlife and managing it, should significantly exceed the previous institutional arrangements. Focusing on the process of institutional change rather than the viability of wildlife emphasizes the common pool nature of the problem.

Between 1989 and 1999, rural district councils earned a total of US\$15.87 million from wildlife-based activities (table 22.2), including 89 per cent from leases with private sector safari operators, 6 per cent from the sale of hides and ivory, 5 per cent from a combination of photographic tourism leases (2 per cent) and miscellaneous activities. Of the revenue earned from safari hunting, at least 60 per cent can be attributed to elephant (Bond, 1999). The development of photographic tourism within the communal lands has been constrained by the fragmented nature of most of the wildlife habitat and, relative to the

protected areas of Zimbabwe, low wildlife population densities.

Wildlife revenue is allocated annually, in arrears, to wildlife producer wards, wildlife management activities and to a rural district council levy. In 1991, as a response to highly variable subdistrict allocations by district councils, the Department of National Parks and Wildlife Management issued the *CAMPFIRE guidelines*. These recommended that at least 50 per cent of wildlife revenues was to be allocated to producer wards, up to 35 per cent should be retained by the rural district council for wildlife-specific activities and 15 per cent could be appropriated by the council for general revenues (Department of National Parks and Wildlife Management, 1991). At a national level, the guidelines have been largely implemented (table 22.3). At district level, however, the disbursements of wildlife revenue have been characterized by a high degree of variability both within and between districts. This has led to the conclusion that the weak and unenforceable policy framework is allowing rural district councils to control and allocate wildlife revenue to the exclusion of local communities' involvement (Bond, 1999).

Assuming the conditions for institutional change (Ostrum, 1998), the most important indicator of the incentives created by CAMPFIRE is the gross annual benefit per household. Typically, the benefits were highly skewed and in general very low. Between 1995 and 1999 the median benefit per household varied between US\$2.2 in 1998 (range US\$0.18 to US\$252.30; n = 86) and US\$5.8 in 1999 (range US\$0.16 to US\$197.53; n = 100). Comparisons of gross

Table 22.2. Income earned by rural district councils with appropriate authority between 1989 and 1999

	Safari hunting	Tourism	Hides and ivory	Other	Total
Income (US\$ million) by activity	14.1	0.37	0.94	0.46	15.87
% of income by activity	89	2	6	3	100

Source: WWF-SARPO

Table 22.3 The allocation of wildlife revenue earned by rural district councils: 1989 to 1999

	Producer wards	Wildlife management	Council levy	Other and not recorded	Total
Revenue allocated to	8.0	3.2	1.6	3.0	15.8
% of total revenue allocated	50	21	9	20	100

Source: WWF-SARPO

household benefits with agricultural production showed that in most wards the income from wildlife was purely supplementary to crop and livestock production (Bond, 1999; Logan and Mosely, 2001). The low benefits earned from wildlife were a function of both biophysical and institutional factors. Within CAMPFIRE only a handful of wards could produce significant annual household benefits due to their low human population densities. Institutionally, producer wards were constrained by the opportunistic attitudes of rural district councils towards wildlife revenue (Bond, 1999).

Given this analysis, it followed that CAMPFIRE was unlikely to achieve widespread institutional change for the management of wildlife and wildlife habitat. There were, however, local exceptions where the direct benefits from wildlife production were very high. In these wards, there were tangible changes in attitudes to wildlife, substantial local-level investment in the management of wildlife and locally initiated land-use planning in support of wildlife production (for example, Kanyurira ward, Guruve rural district council and Mahenye ward, Chipinge rural district council). The revenues generated by rural people's resource management and ecotourism efforts were received by the rural district councils which had considerable discretion as to how much money to pass on to the local level. This reduced the programme's effectiveness in the long run.

Post-independence research, development and policy failure

Investment in wildlife research compared with that in agricultural research in Zimbabwe has been remarkably low. Over the last two decades, however, the significant changes and progress in Zimbabwe's wildlife sector have provided a wide range of research opportunities to both local and foreign scholars. Locally initiated research projects have been conducted by a wide variety of academic and non-governmental organizations, including most members of the CAMPFIRE collaborative group.²⁰⁴ Internationally initiated research projects have generally adopted a comparative approach to lessons learned from CAMPFIRE and other regional community-based natural resource management programmes. Common to many of the research initiatives and projects are the methodological problems due to the complexity of the community-based natural resource management processes, which makes determining causality very

²⁰⁴ The CAMPFIRE collaborative group was a loose affiliation between the organizations implementing CAMPFIRE. Originally convened by the Department of National Parks and Wildlife Management, the group was headed by the Campfire Association from 1992. The group included, among others, the Campfire Association, Department of National Parks and Wildlife Management, Centre for Applied Social Sciences, Zimbabwe Trust, Africa Resources Trust and Action.

difficult. In addition many of these studies have suffered from spatially and temporally limited data sets.

In the first decade after independence, government agencies, particularly the research branch of the Department of National Parks and Wildlife Management and the Department of Veterinary Services, continued to lead wildlife-based research and development. Along with private sector partners they were responsible for many of the technological advances which stimulated the development of the ostrich and crocodile industries. In particular, large mammal research conducted within the Department of National Parks and Wildlife Management, continued to influence wildlife management decisions within the parks and wildlife estates (for example elephant management and reduction programmes). This maintained the cohesiveness between research and policy developed by Department of National Parks and Wildlife Management before 1980 (Child, 1995). This relationship reached a watershed in 1989 when CITES upgraded all African elephant populations to Appendix 1. By restricting elephant management options for the Department of National Parks and Wildlife Management, CITES contributed to reducing the department's influence on wildlife policy which in turn paved the way for the recentralization of wildlife matters by the Minister and the Ministry of Environment and Tourism in 1995. This was in line with government's objectives of exerting greater control over the wildlife sector and its stakeholders.

After 1990, the focus of wildlife-based research and the principal actors changed significantly. A movement towards participatory research in the 1990s provided space for community-grounded organizations to take the lead. Previously most of the applied research had been carried out by government agencies. After 1990, the socio-economic variables became the focus of the research effort. The research was conducted mostly by non-governmental organizations and academic institutes, albeit under nominal supervision of the Department of National Parks and Wildlife Management. The new direction of the research was fully justified by the need to understand and develop effective policies for wildlife and natural resource management in the communal lands. In contrast, however, with the close relationship between research and policy before 1990, the last decade has been characterized by an increasingly dysfunctional relationship. The result has been that recommendations derived from the investment in research appear to have had little or no impact on wildlife and natural resource policy. These themes and their possible causes are investigated below within the context of the opportunities that have been forgone by the wildlife sector.

In the large-scale commercial farming sector, despite the evidence from the changes made by landholders and predicted by research (Price Waterhouse, 1994; Jansen *et al.*, 1992; Child, 1988), wildlife as a land-use failed to achieve legitimacy within many sectors of government, the general public and the rul-

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