

ZIMBABWE

COUNTRY REPORT ON THE STATE OF THE WORLD'S ANIMAL GENETIC RESOURCES

May 2004

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EXECUTIVE SUMMARY

Agriculture contributes about 20 per cent of Zimbabwe's GDP. In a normal rainfall year, agriculture provides the bulk of the nation's food requirements, 60 per cent of the raw materials for industry, 45 per cent of foreign exchange earnings and 26 per cent of formal employment. Livestock production contributes about 25 per cent of value of agricultural output in all farming sectors. The main livestock species are cattle, goats, sheep, pigs and poultry. Donkeys are becoming increasingly important in the semi-arid regions of the country. The main livestock products include meat, draught power, milk, eggs, fibre, hides and skins.

About 85 per cent of the 39 million hectares land area in Zimbabwe is agricultural land. At Independence, Zimbabwe inherited a racially skewed agricultural land ownership pattern where a minority 1 per cent of the population occupied 45 per cent of the agricultural land, 75 per cent of which was in the high rainfall areas of Zimbabwe.

The recent agrarian reform have transformed the structure of agriculture in Zimbabwe following the successful implementation of the Land Reform Programme during the last two to three years which resulted in Government acquiring 11 million hectares for the purpose of resettlement.

The land and agrarian reforms have restructured access to land by equitably distributing land and transforming farming systems and the institutions that deliver services to farmers. The objective of decongesting communal areas and de-racialising commercial agriculture has been achieved and the focus is now on agrarian reforms that will result in increased agricultural production.

Zimbabwe is endowed with diverse breeds of all species, comprising both indigenous and exotic types. The exotic breeds are dominant in the commercial sector, which is the main source of marketed livestock products. Indigenous breeds are numerically predominant in the country and these are reared mainly in the smallholder sector where they perform multiple functions. The indigenous Nguni cattle breed and the Sabi sheep breed are threatened with extinction. Measures to conserve them need to be established.

Several public and private institutions are actively involved in management and use of animal genetic resources (AnGR) in Zimbabwe. The most important of these institutions is the Ministry of Lands, Agriculture and Rural Resettlement (MoLARR) and its departments and parastatal bodies. Although Zimbabwe has some human capacity for the management of AnGR, there is need to increase this capacity and to develop greater awareness on the conservation and utilisation of

these resources in a sustainable manner. The country is endowed with good infrastructure that can enhance the development of AnGR.

The technologies currently available include artificial insemination, embryo transfer and performance recording mainly in the dairy sector. *In situ* maintenance of indigenous nucleus herds has been on-going on research stations and private breeding farms over the last three decades.

There is need to enhance further the capacity for the management, conservation and utilisation of AnGR. Such capacity building measures include setting up of performance recording schemes covering all farming sectors, promoting formation of farmer associations and indigenous breed societies, developing policy incentives for sustainable use of indigenous AnGR, and training. The main national priorities for the conservation and utilisation of AnGR include a comprehensive livestock breeding policy, appropriate use of indigenous versus exotic AnGR, human resources development in support of AnGR, development of an information management system for AnGR, and mechanisms for creating awareness on the importance of AnGR in national development and food security.

Zimbabwe shares some indigenous breeds with its neighbours, therefore cooperation in the conservation of AnGR that cut across political boundaries will be necessary. Such cooperation includes: harmonisation of policies and legislation in order to establish mutual ownership, protection and access to these shared AnGR; regional and international collaboration in research and development; improved capacity to detect trans-boundary diseases and to certify freedom from such diseases so as to facilitate trade in AnGR; and information sharing.

1. THE STATE OF AGRICULTURAL BIODIVERSITY IN THE FARM ANIMAL SECTOR OF ZIMBABWE

1.1 Overview of the Zimbabwe animal production system

Location and Size of Zimbabwe

Zimbabwe is a landlocked country in the Southern African region, lying between the 15° 33' S and 22° 24' S latitudes and 25° 12' E and 33° 03' E longitudes. It borders Zambia in the North, Mozambique in the East, South Africa in the South and Botswana in the West. The total land area is 390,759 km²

Main Climatic and Geographical Features

Zimbabwe is situated within the tropical savannah region. The climate is subtropical with four overlapping seasons: summer (mid-November to early March), autumn (March to May), winter (May to August) and spring (September to mid-November). The mean annual temperature ranges from 18°C to 23°C. Mean maximum temperature is 30°C in October and mean minimum temperature is 7°C in July. Some areas are susceptible to ground frost. Rainfall is seasonal, most of which falls during the summer months. Annual rainfall ranges from below 450 mm to over 1,000 mm depending on the agro-ecological region (Table 1).

Zimbabwe comprises an undulating landscape with mountain ranges in the east (the highest being Mount Inyangani with a height of 2,592 m) and low plains in the Zambezi valley and the Limpopo-Sabi basins where the altitude is below 600 m (the lowest is 162 m at the junction of the Runde and Save rivers). The country can also be described in terms of altitude. The High Veld is the area over 1,200 m above sea level (a.s.l.) and covering 24 percent of total land area, the Middle Veld lies between 900 m and 1,199 m a.s.l. (40 per cent), and the Low Veld is the area below 900 m a.s.l. (36 per cent) (See Annex 1).

Natural Regions and Land Distribution

The country can also be described according to five natural regions (NR). These are classified mainly by the soil type and average rainfall. This classification determines the type of agricultural activity recommended for the NR (Table 1; Annex 2, Map 1).

Table 1: Classification of Natural Regions and Farming Systems in Zimbabwe.

Natural Region ¹	Farming Systems	% Land Area	Mean Annual Rainfall (mm)	Rainfall Reliability
I	Specialized and diversified farming (Forestry, plantations; intensive livestock production)	1.8	>1000	Reliable all-year round
II	Intensive farming (Cropping e.g. tobacco and wheat; intensive livestock production)	15	750 - 1000	Reliable summer rain
III	Semi-intensive farming (Cropping can be risky; livestock production)	18.7	650 - 750	Erratic with seasonal droughts
IV	Semi-extensive farming (Drought resistant cropping; semi-extensive livestock production)	37.8	450 - 650	Frequent seasonal droughts
V	Extensive farming (Extensive livestock production)	26.7	<450	Low, prone to droughts

(Adapted from Ellis-Jones et al. (1994) and Morriss (1995))

¹See Annex 2

Human Population Trends

In 1992, the human population in Zimbabwe was 10.4 million and the annual growth rate was estimated at 3.14 per cent. By 1999 the population had increased to an estimated 11 to 12 million with a population density of 30 people/km². The 2002 national census results estimate the population at 11.6 million with an annual growth rate of 1.1 per cent. The decline in the annual growth rate since 1992 is mainly attributed to the impact of HIV/AIDS. Zimbabwe's population is projected to decline because of HIV/AIDS to 10.3 million in 2025 and 10.1 million in 2050.

The Zimbabwe Agricultural Sector

About 7 per cent of the country's land area is arable, 13 per cent is permanent pastures, 23 per cent is forest and woodland and the remaining 57 per cent represents urban areas, mines and water bodies. Of the arable land, about 200,000 ha is irrigated.

Following the successful implementation of the Land Reform Programme, the agricultural industry now comprises three major farming sectors namely: -

- Communal (farmers have access to small pieces of land with average land holding of 2.1 ha arable and they share grazing land).
- A1 (Resettled villagised and self-contained model which is aimed at decongesting the communal areas. Farmers have access to an average of 5 ha arable land and grazing land ranging from 6 ha in NR I to 20 ha in NR V).
- A2 - Commercial farm model through which farmers have access to land under four categories as follows:
 - Peri-urban commercial farms where sizes range from 15 to 50 ha
 - Small scale commercial farms with sizes ranging from 15 ha in NR I to 350 ha in NR V
 - Medium scale commercial farms with sizes ranging from 100 ha in NR I to 1500 ha in NR V and
 - Large scale commercial farms ranging from 250 ha in NR I to 2000 ha in NR V.

The A2 has indigenised commercial farming and has resulted in a de-racialised commercial farming sector.

Agriculture is the mainstay of Zimbabwe's economy contributing between 15 and 20 per cent of GDP, which rose from US\$ 6.7 billion to US\$ 8.2 billion between 1987 and 1997. Agriculture also provides the bulk of the nation's food requirements in a normal rainfall year, 60 per cent of the raw materials for

industry and 45 per cent of foreign exchange earnings. As at March 2001, agriculture provided 26 per cent of the formal employment in the country and 70 per cent of the population with employment or livelihood. The main crops grown are maize, tobacco and cotton. Horticultural production is fast becoming a major foreign currency earner, contributing about 4 per cent of GDP.

Livestock products contribute about 25 per cent of value of agricultural output in all farming sectors. Beef accounts for over 70 per cent of domestic consumption of marketed meat followed by poultry meat, pig meat and small ruminant (sheep and goat) meat.

About 64 per cent of Zimbabwe falls in NR IV and V in which rainfall is too erratic and unreliable for consistent and viable crop production (see Table 1). Except for a few situations where water for irrigation is available, range livestock and wildlife production are the most viable agricultural activities. On the other hand the higher rainfall regions offer potential for intensive production of all species of livestock because of the possibility of integrating crops with livestock. Consequently, commercial livestock production has been highly dependent on grain, particularly maize, as the energy source. Secondly, the cattle feedlot systems developed since the mid 1960s and now in common use in NR II depend primarily on availability of grain. This has made crop and livestock production highly complementary. It has also enabled cattle to be finished at a young age. This has enhanced production turnover and has made the high rainfall cropping areas a major source of beef for both domestic and export markets. For pigs and poultry, grain accounts for some 70 per cent of their diets.

The State of Food Security and Rural Development

Food Security

Over the years, Zimbabwe has been food self-sufficient and was a net exporter of food products. However, this food self-sufficiency has been disrupted by severe droughts of 1981-82; 1991-92; and 2001-02. After Independence in 1980, there was an influx of people into the urban areas from the rural areas. In 1999, however, it was estimated that 73 per cent of the population still lived in the rural areas and 27 per cent in urban areas. The HIV/AIDS pandemic is taking its toll on the adult population both in urban and rural areas. The exact impact of the pandemic on population growth needs to be determined. With the high death rate due to HIV/AIDS among the adult population, agricultural labour is increasingly relying on the elderly, the young and the infirm. It is estimated that 33.7 per cent of people in the age group 15 to 49 years are HIV-positive or have AIDS. This is impacting negatively on agricultural production. In addition, the on-going land reform program is likely to change urban to rural population

balance. Consequently, the implications to food security and rural development will need to be determined.

Ownership of Livestock

Smallholder farmers are the major owners of livestock in Zimbabwe. In 1988, they owned 68 per cent of all cattle, 99 per cent of all goats, 84 per cent of all sheep, 60 per cent of all pigs and almost all donkeys. Every rural household owned poultry.

Role of Livestock

The commercial sector is the major source of meat and dairy products sold through formal marketing channels. Livestock, particularly cattle, are an integral part of the smallholder farming system in which production of beef is of lower priority to provision of draught power and milk for subsistence consumption. Small ruminants (sheep and goats) and non-ruminants (pigs and poultry) are far less important than cattle in the lives of people in smallholder areas and these livestock are reared primarily to provide a source of meat and cash.

Per capita consumption of animal products in developing countries is expected to increase from 25.5 to 37 kg (meat); 45 kg to 66 kg (milk and dairy products) and 6.5 to 8.9 kg (eggs) between 1997 and 2030. These consumption levels will require increased livestock production. Livestock product availability in Zimbabwe remained relatively stable throughout the 1990s except for poultry, which has experienced significant growth. Consumer prices of animal products have a major effect on consumption levels. Sheep meat is the most expensive, while beef, which is traditionally the preferred meat, has also become expensive with price relativity moving in favour of cheaper meats. Goat meat is the next most expensive while poultry and pork are relatively cheap. Dairy products, particularly cheese, are especially expensive.

The State of the Production Systems

Production in the Semi-arid Regions

Livestock production systems in Zimbabwe are determined by the agro-ecological region and the type of farming sector. In the semi-arid NR IV and V and parts of NR III, the main production system is extensive grazing on natural rangeland as well as wildlife production. The major livestock species are cattle, goats, sheep, poultry and pigs. Cattle are the predominant species in this system followed by goats and sheep. Other specialized systems such as dairying, pig and poultry production and pen fattening of ruminants are also practiced where resources permit. Exotic beef cattle breeds are predominant in this system

comprising Brahman, Simmental, Hereford, Sussex, Aberdeen Angus, Beefmaster, Limousin, Charolais and others. Of the indigenous cattle breeds, the Tuli and the Mashona are the most commonly used followed by the Nguni.



Tuli cow



Nguni bull



Mashona cow

For dairying, the Jersey breed is predominant in the semi-arid regions, followed by the Holstein-Friesian the Red Dane and the dual-purpose Simmental. The predominant goat breed in the commercial sector is the exotic Boer reared primarily for meat production. The Saanen goat breed is reared for milk production while Angora goats are reared for mohair production. A few commercial farmers rear the indigenous Matebele goat for meat production.

The Dorper is the predominant breed in commercial production of lamb and mutton. Other important breeds are the Wiltiper, the South African Mutton Merino, the Blackhead Persian (BHP), the Dorset Horn, the van Rooy, the Corriedale and the Suffolk. The major pig breeds in the commercial sector are the exotic Landrace, the Large White, the Duroc and the recently introduced Dalland. Commercial poultry production is based on exotic hybrids. The main hybrids include Hyline Brown, Lohmann, Harvest, Hyline White, Cobb, Ross, Indian River, Nera, Rhode Island Red, Black Australorp, Light Sussex and White Plymouth Rock.

In view of the semi-arid nature of these natural regions, production can be risky particularly for pig, poultry and dairy which depend on substantial feed inputs. The success, therefore, will depend on availability of external inputs such as finance, labour, veterinary requisites, supplementary feeds, irrigation water and breeding stock for restocking after droughts.

In the smallholder sector in the same NR III, IV and V, production system is mainly of mixed livestock and crop production. Livestock production depends mainly on natural grazing with little or no supplementary feeding. Therefore, this is a low input and low output production system and livestock productivity is generally low. Cattle, goats, sheep, donkeys, poultry and pigs are the main species raised in this system. The animals are mainly the indigenous AnGR, which are adapted to the local environment. The cattle breeds are largely the Tuli, Nguni and Mashona. Several dairy improvement schemes have been established which use exotic dairy breeds crossed with indigenous cattle. The main goat breeds are the indigenous Matebele and Mashona (Small East African) types. There has been considerable infusion of the Dorper and the Blackhead Persian sheep breeds in the smallholder farming sector such that crossbred types are now predominant. The indigenous Sabi sheep breed is considered endangered.



Matebele goats



Mashona goats



Sabi sheep



Mukota pig

About 95 per cent of the goats are reared in the smallholder farming sector and as for pigs, the indigenous Mukota is the dominant breed in this sector. The bulk of the poultry population is also in the smallholder sector in which over 96 per cent of households own poultry, with average flock sizes of 15-20 birds. Both indigenous and exotic types are found in this sector. Smallholder farmers account for about 50 per cent of all day old chicks marketed in Zimbabwe, enabling a cash business to develop in this sector with very little capital. Thus broiler and egg production have become increasingly important in the smallholder sector and government has encouraged small scale poultry production in order for rural households to generate cash income and improve their nutrition.



Some indigenous chickens

Donkeys are increasingly becoming important for draught power in the smallholder sector. They are however, considered as “types” as no proper breed characterization has been conducted.



Zimbabwean donkeys

Production in the High Rainfall Regions

In the high rainfall areas (NR I, II and parts of III) the breeds across all livestock species are similar to those in the semi-arid regions. The Holstein-Friesian is the predominant dairy cattle breed in these areas. Donkeys are less important than in the semi-arid areas of the country. The system of livestock production is generally much more intensive than in the semi-arid regions. As a result of the intensification of production and the opportunity for integration with crop production, at least 60 per cent of production of all livestock species is from the high rainfall areas.

Whereas in the commercial sector, livestock production is specialized and individual farmers produce one or two commodities. In the smallholder sector, livestock perform the following multiple functions: provision of draught power, meat (including blood), milk, manure, fibre and skins, cash, and socio-cultural roles. The primary livestock products from the above system therefore are: draught power (cattle, donkeys), meat (cattle, pigs, sheep, goats, poultry, ostriches, rabbits), milk (cattle, goats), cheese (cattle and goats), eggs (poultry), breeding stock (mainly cattle, chickens, sheep, goats, pigs), fibres and feathers (sheep, goats, poultry, ostriches), hides (cattle, sheep, goats, ostriches), hair (Angora goats) and manure (all species).

1.2

State of Conservation of Farm Animal Biological Diversity

The indiscriminate introduction of exotic breeds has led to the genetic contamination of the more adapted indigenous AnGR, which are increasingly under threat. However, some nucleus herds and flocks of indigenous cattle (Mashona, Nguni and Tuli) and Sabi sheep have been maintained *in situ* on government research stations and individual farms. The Nguni cattle and Sabi sheep are considered to be at risk of extinction.

The *ex situ* conservation measures currently available in Zimbabwe are semen storage, artificial insemination (AI) and embryo transfer technology. This technology is available from two private breeding companies through which local and imported semen has been obtainable. In view of the potential financial constraints of *ex situ* conservation, conservation with utilization seems to be the more appropriate option whereby the communities are the custodians of the AnGR.

Characterization of indigenous livestock breeds has been conducted in terms of physical characteristics and production traits including a description of the production environment under which AnGR perform. This breed characterization has however been limited to beef cattle, sheep, goats and pigs. The Zimbabwe Farm AnGR Survey was conducted in 2000/01 on six species (cattle, sheep, goats, chickens, pigs and donkeys). The purpose of the survey was to obtain reliable estimates of population sizes and distribution of farm animal breed resources, as well as to determine management, production and socio-cultural practices employed by farmers in raising these animals. The full analyses of these surveys have not yet been completed.

Molecular genetic characterization, valuation of breeds and evaluation of risks have not been done in Zimbabwe, apart from some work conducted in collaboration with the International Livestock Research Institute (ILRI), University of Porto (donkeys) and the Irene Animal Improvement Institute in South Africa. Further DNA-level studies may help Zimbabwe to categorise livestock breeds in terms of genetic distances.

No information management system for breed conservation and use is in place. There is need for development of such a system to collect, process, store and disseminate all information on breed conservation and their uses.

1.3 State of Utilization of AnGR

Cattle

There is no deliberate policy against the use of certain breeds for domestic or export markets. However, the current carcass grading system discriminates against small breeds, which discourages the production of some indigenous breeds, yet the indigenous breeds are more adapted to the harsh environments than exotic breeds and have the potential to bring smallholder farmers into the mainstream market economy. Secondly, the absence of matching appropriate AnGR to specific environments or production systems leads to inefficient utilization of AnGR, particularly for the exotic breeds. In some societies the black Mashona and the red and white Nguni are preferred for ceremonial purposes.

The cattle industry comprises stud and commercial herds. In the stud herds pure breeding and selection are practiced. Crossbreeding is common in commercial herds mainly to exploit heterosis and upgrading indigenous breeds for milk production. In the smallholder sector breeding is unstructured. Over the years there have been substantial breed substitution in Zimbabwe. The Afrikaner dominated the commercial herd in the 1970s but the Brahman breed has since become the most predominant breed, accounting for 38 per cent of bulls used on commercial herds. The number of registered Tuli herds increased from three to 12 over the same period. The indigenous Tuli breed now constitutes 6 per cent of bulls used in commercial herds.

Advancement in technologies such as AI and embryo transfer has potential for application in the conservation of indigenous AnGR. Other biotechnologies such as embryo cyro-preservation, *in vitro* embryo production, sexing of semen and embryos and MOET, require certain levels of sophisticated technological support, which may require collaboration with external institutions. The stringent international policies and regulations of the Office International des Epizooties (OIE) standards, the requirement to trace the origin of animal products and animal welfare issues are a challenge to Zimbabwe.

Importation of exotic AnGR is allowed in Zimbabwe. Although there are stringent veterinary regulations regarding importation of live animals, semen and embryos, there is no thorough evaluation before the importation. In future, imported exotic AnGR need to be evaluated first against locally available AnGR before they can be released or multiplied for commercial use. In the dairy industry, however, the importation of exotic AnGR has been the basis for genetic improvement. Some government research stations and institutions are developing suitable dairy crossbreds using the indigenous breeds and locally

adapted Jersey and Red Dane breeds which are more suited to harsh environments than other exotic dairy breeds.

Goats and Sheep

Policies and regulations on the importation and movement of other livestock species, also apply to sheep and goats. The use and importance of goats varies between regions and ethnic groups. Milking of goats is more important in semi-arid NR IV and V compared with the high rainfall regions. Crosses of Boer and indigenous goats are common in smallholder farms in the proximity of commercial goat producers. In the commercial sector, systematic cross and straight breeding are widely practiced. Some exotic breeds have been used to a limited extent, either as purebreds or crossbreds, for mohair (for example, the Angora breed) and milk production (for example, the Saanen breed).

The importance of sheep also varies between regions and ethnic groups. While farmers in most parts of the country rear sheep primarily for meat production, some ethnic groups keep sheep mainly for socio-cultural purposes. The exotic Dorper breed is the most important breed in commercial sheep production followed by the Mutton Merino. In an effort to conserve the indigenous Sabi breed, nucleus flocks are maintained on government research stations and the University of Zimbabwe.

Pigs

Although there is no deliberate policy discriminating any pig breed, the exotic Large White, Landrace, Duroc and the Dalland breeds and their crosses are preferred for commercial production for both the domestic and export markets. The Large White, Landrace and Duroc breeds contribute 75 per cent of total pigs slaughtered annually. The Dalland breed, which was introduced in 2000, contributes the remaining 25 per cent. This breed is mainly used as a terminal sire and has had a major effect on the genetic composition of slaughter pigs. The pork processing industry shuns indigenous pig breeds such as the Mukota, principally because of their black hair follicles on the carcass and their small size. Therefore, their contribution to the formal pork market is very low. However, indigenous breeds are popular in the provision of fresh meat in rural communities where the meat is considered tastier than that from exotic breeds. Some religious sects do not consume pork, therefore this limits pig production in some areas of the country.

Breeding in the smallholder sector is commonly unstructured with rampant inbreeding in individual herds. In the commercial farming sector, and to a lesser extent in the smallholder sector, farmers commonly produce crossbred Large

White and Landrace sows and boars in order to benefit from heterosis. Techniques such as embryo transfer, marker assisted selection and pedigree confirmation, have not been used in Zimbabwe.

The main institutions involved in the development of pig AnGR are private breeding farms, government departments of extension and veterinary services, the Pig Industry Board (PIB) and the Agricultural Research Trust. There has been little attention given to indigenous knowledge on pigs, although this has been promoted for other species.

There are veterinary policies that control the importation of all livestock species including pigs to prevent the introduction of diseases. These policies require that imported live pigs are quarantined and examined before introduction into the national herd. The policies can potentially make it difficult to import new genetic material into the country. Some international policies such as the requirement to eliminate the Halothane gene in pigs, will impact on the pig industry. Farmers exporting pigs through COLCOM have to comply with this regulation.

Poultry

Commercial hybrids play an important role, particularly in urban areas where fast foods outlets thrive. The continual importation of the parent stock of these breeds provides opportunity for continued injection of improved genetic material into the national commercial flock. The indigenous birds provide the bulk of poultry requirements for the subsistence and smallholder communities. Trials have been conducted on-station to evaluate performance traits such as growth, feed conversion efficiency, mortality rates and egg production. Battery and cage housing systems have also been evaluated. There is particular interest in the Fayoumi breed from Egypt for introduction into the Zimbabwe poultry industry. There is also growing interest in turkey, guinea fowl, duck, pigeon and geese production in the smallholder sector.

There are standard veterinary requirements on importation and movement of animals and birds. However, these standards only apply to health. There is indiscriminate use of poultry genetic resources by producers. There is, therefore, need for a consolidated policy framework on the use of poultry genetic resources.

Ostrich

Ostrich production has been on the increase, particularly in the commercial farming sector. The main products are hides, feathers and meat for the export

markets. There is limited demand for ostrich products on the domestic market mainly due to the high prices for these products and the fact that consumption of ostrich meat is not a traditional practice in the country. Domesticated ostriches are used but no breed characterization has been undertaken.

Equines

The only known legal instrument regarding donkeys is the prohibition of the use of neck yokes on animals used for traction. Until the early 1990s, donkeys had been largely neglected by farmers as well as research and extension institutions despite their contribution to food and agriculture. However, their utilization as draught animals is increasing particularly in the drier semi-arid regions. It is taboo in many parts of the country to use donkey products such as meat. Some communities however use donkey milk for infants as it is considered therapeutic. Although different donkey phenotypes exist, no distinct breeds have been identified. There has been limited characterization, using mitochondrial DNA analysis, in collaboration with some international institutions. There has also been limited use of indigenous knowledge.

Unstructured breeding of donkeys is predominant in the smallholder sector. There are reports of crossbreeding of the local donkey type with some imported donkeys from South Africa. There has also been mule production on some private commercial farms.

The horse industry in Zimbabwe is mainly operated on a commercial basis. Most stud breeders are located in peri-urban areas and their main focus is production of thoroughbred horses for racing. The other uses for horses are riding, show-jumping, patrol of farms and national parks and for use by police and the army. There are very few or no horses in the smallholder sector.

Rabbits

Rabbits are produced under small-scale and/or backyard systems mainly for meat. All the domesticated breeds are exotic. The established breeds include the Chinchilla Giganta, New Zealand White and New Zealand Red, the Zika crossbred from Germany and Angora rabbit breed.

2. CHANGING DEMANDS ON NATIONAL LIVESTOCK PRODUCTION

Production

The 1991-92 drought, the worst in living memory, resulted in substantial loss of animals of all species. The smallholder sector was more affected because of the limited feed and water resources in this farming sector. In the case of cattle, the drought resulted in 8 per cent decline in the size of the herd in the commercial sector and 31 per cent decline in the smallholder sector. Growth of the commercial beef herd subsequent to the 1991-92 drought has been hampered by viability problems. It is estimated that the commercial beef herd has declined from 1.5 million head before 1991 to between 250,000 and 400,000 head in 2002. Over the same period, the number of dairy farmers and the size of the national dairy herd have also declined, from about 190,000 milking cows in 1999 to about 70,000 cows in 2002.

In the smallholder sector, one of the consequences of the 1991/92 drought was that many households were left without cattle for draught power. This has led to an increased use of donkeys particularly in the more arid parts of the country. At the same time cattle re-stocking programmes have been established by both government and NGOs, using cattle purchased from the large-scale commercial ranches. However, because very few commercial ranches rear indigenous cattle, these restocking programmes have been based on the use of the exotic AnGR that are less adapted to the smallholder farming system and can therefore be expected to be worse affected by subsequent droughts. These restocking programs have also accelerated the genetic contamination of the indigenous AnGR in the smallholder sector because mating is generally uncontrolled.

Institutional Arrangements and Trends

The last decade has witnessed major changes to the institutional arrangements in animal agriculture. Following market liberalisation in the 1990s, parastatal institutions were commercialised and others were privatised. Thus, the meat processing Cold Storage Commission was commercialised to become the Cold Storage Company Ltd. (CSC). In addition, many private abattoirs were established. Consequently, CSC market share has declined from 85 per cent before liberalisation to about 36 per cent. The Livestock Development Trust (LDT) was established in 1995 to spearhead livestock development and marketing in the smallholder sector. The Livestock Identification Trust (LIT) was established in 1999. The LIT is responsible for registering animals in order to meet international requirements for traceability of meat and other animal

products on the export markets. In the dairy sub-sector, the Dairy Marketing Board (DMB) was privatised to the new Dairibord Zimbabwe Limited (DZL). New private dairy companies were also established. The Dairy Development Programme (DDP) was established in 1983 to promote milk production and processing in the smallholder-farming sector. Prior to the establishment of the DDP, no milk was sold to the formal market by the smallholder sector. To date, 21 dairy schemes are in operation nationally and 18 milk-processing centres have been established throughout the country. The smallholder contribution to total national milk production is however still small at 5 per cent.

There have been institutional changes to the Zimbabwe pig industry in the last ten years. The major was in 1996 when COLCOM, the largest pork processing company, went public and the pig producers became minor shareholders. This period saw the establishment of small abattoirs. Over the past few years the contribution of smallholder farmers to total pig production has gone up substantially, following the implementation of the Land Reform Program.

The last decade has also witnessed the development of ostrich production as a new enterprise, focusing mainly on the export market. Initially live birds were the main export product, primarily to Europe, North America and some Asian countries. However, the export of live birds was discouraged and eventually phased out in favour of exporting processed products. At the same time, two ostrich abattoirs were established, one by the Bulawayo Ostrich Producers (BOP), a private venture renting premises from the CSC, and the other in Norton, near Harare by the Ostrich Producers Association (TOPAZ). Although many farmers went into ostrich production in the formative years, the very stringent veterinary regulations, the lack of facilities for incubating eggs, the cost of feed and the management levels required, forced many farmers from the smallholder sector to quit production. Consequently, ostrich production has remained in the hands of a relatively few specialized producers.

One important trend has been the development since the 1980s of the livestock research and extension programmes focusing on smallholder production of all species of livestock. This included feeding systems based on the use of crop residues, small grains, browse and other locally available feed resources, as well as characterisation of indigenous and exotic AnGR and their crosses. Although more research is needed, particularly characterisation of indigenous and exotic pig, goat and poultry breeds, research to date has contributed to greater understanding of the potential of indigenous AnGR, the need for their conservation, and the realisation that indigenous AnGR should form the basis of livestock production in the country. Recent research on the donkey has also led to greater understanding of the potential role of this species as a draught animal especially in the arid regions of the country.

Factors limiting animal production efficiency

The main factors limiting animal production efficiency include the following:

1. Inadequate feed resources in the smallholder sector due to limited grazing land. Secondly, the low crop yields result in little or no surplus food for non-ruminant livestock.
2. The effects of the frequent droughts and the limited development of water resources for livestock especially in the smallholder communal areas.
3. Insufficient numbers of animals of the improved indigenous breeds. Consequently, restocking programmes following droughts have had to rely on the use of the less appropriate exotic breeds.
4. Lack of a clear and consolidated policy on farm AnGR.
5. The national systems of grading carcasses of cattle, pigs and small ruminants penalize the indigenous breeds and therefore discourage the use of indigenous AnGR.
6. Lack of formal markets for small ruminants and poultry. While beef producers can market their animals through the private and public abattoirs, or on the hoof through public auctions, such facilities are generally not available for small ruminants and poultry producers. Consequently, many smallholder producers rely on the informal marketing channels. This discourages production.
7. Lack of funding for herd health programs and for provision of general animal health extension services for the newly resettled farmers. Consequently, disease control and prevention through planned and scheduled activities, such as vaccinations, dipping, de-worming and record-keeping, have been limited.
8. Frequent outbreaks of diseases, especially Foot and Mouth Disease (FMD) and Newcastle disease, disrupt production, marketing and trade.
9. Access to capital is a major limiting factor, especially in view of the current high interest rates and the long-term nature of investments in breeding stock.

Possible coping strategies

1. The use of locally available feed resources such as crop residues, wild pods, home-grown forages to supplement grazing could be enhanced. Where possible, bought-in commercial feeds can also be used where this is economically justified.
2. Better water-harvesting and conservation techniques such as pitting, brush cover, ridging and construction of small dams.
3. Establishing nucleus herds of indigenous livestock of all the species. This is necessary in order to build up numbers to meet current and future demand.
4. Encourage government to develop enabling and appropriate policies on AnGR. In addition it will be necessary to increase extension services and technical support to framers.
5. The systems of grading live animals and carcasses have been revised and are being implemented. This should enhance livestock production and marketing.
6. Deliberate programmes for training smallholder farmers on marketing of small ruminants and poultry should be developed and implemented in order to enhance their participation.
7. Increased funding of the veterinary department, particularly provision of foreign currency for importation of veterinary medicines, drugs, vaccines and dip chemicals.
8. Provision of adequate resources for the surveillance and control of notifiable diseases, such as FMD and Newcastle Disease.
9. Increased financial support to livestock development through provision of loans to farmers at more affordable interest rates than currently available from the private financial sector

Impact of HIV/AIDS

HIV/AIDS has exacerbated poverty by decreasing agricultural productivity thereby worsening household food security. HIV/AIDS increases the attrition rate of services provided and reduces the availability of labour. There is a need to create awareness among service providers, policy makers and farmers on the impact of HIV/AIDS on food security. Similarly, technologies requiring less labour need to be explored. Measures have been put in place to combat HIV/AIDS and these include:

- The AIDS Policy (the AIDS pandemic has been declared a National Disaster)
- The AIDS Fund that caters for the infected and the affected
- National AIDS Institutions (National, District and Village AIDS Committees)

- Programmes on HIV/AIDS being implemented by non-governmental organisations. These include prevention and awareness campaigns, as well as fighting the HIV/AIDS stigma and discrimination against HIV/AIDS patients, and promoting HIV/AIDS treatment.

3. THE STATE OF NATIONAL CAPACITIES AND FUTURE CAPACITY BUILDING REQUIREMENTS

Animal Genetic Resources play a critical role in the socio-economic fabric of Zimbabwe. Critical in sustainable management of Domestic Animal Diversity is the strengthening of capacities of farmers, local communities and their organisations and other stakeholders. Capacity building involves education and training, technology transfer, organisational infrastructure, policy and financial mechanisms.

3.1 National Capacities

Government and Public Sector Support Mechanisms

A number of public sector ministries and institutions have a direct or indirect effect on the management of AnGR. The Ministry of Lands, Agriculture and Rural Resettlement (MoLARR) and its departments and divisions is the most important of these. Other ministries with direct or indirect involvement in agriculture include the Ministry of Tourism and Environment, the Ministry of Industry and International Trade, the Ministry of Health and Child Welfare, the Ministry of Water Resources and Rural Development, the Ministry of Mines and Energy, Ministry of Local Government and National Housing, and the Ministry of Justice, Legal and Parliamentary Affairs.

Other organizations

Many other public sector institutions, parastatal organisations, statutory bodies, private sector associations or societies and Non-Governmental Organisations (NGO) support or have influence on the agricultural sector. Among these are the Commercial Banks, the Agricultural Research Council (ARC), the Livestock Development Trust (LDT), the Cold Storage Company (CSC), COLCOM, Private abattoirs, Dairibord Zimbabwe Limited (DZL), the PIB the Livestock and Meat Advisory Council (LMAC), the Livestock Identification Trust (LIT), the Zimbabwe Dairy Industry Trust (ZDIT) and the Veterinary Services Council (VSC). Most of these organisations have functions clearly related to their titles.

Public Extension Services

At Independence in 1980 the main challenge in the agricultural sector was to integrate smallholder farmers into the modern cash economy. The Department of Agricultural, Technical and Extension Services (AGRITEX) was then established with the mandate to provide technical, extension and advisory services to all agricultural related activities in Zimbabwe. However, the expansion in numbers of farmers to be served has not been matched by the budgetary increases necessary to sustain an effective service. Other public institutions providing livestock extension services include Department of Veterinary Services, Department of Livestock Production and Development, the universities, agricultural colleges and other parastatals.

Private Extension Services

Over the years reduced budgetary allocation to the public sector extension services has resulted in lowered effectiveness because it has not been possible to maximise contact with farmers in the smallholder sector. This situation has been mitigated to a considerable extent by delivery of extension by the private sector; stock feed companies, agro-chemical companies and other input suppliers.

Other private sector organisations involved in AnGR include the Zimbabwe Herd Book (ZHB), which is the central reference for all records of pedigree animals of all domestic livestock species. The ZHB operates closely with the LIT. Breed societies are groups of producers interested in the rearing and promotion of a particular breed. Many NGOs actively support animal production in areas as diverse as assistance in group formation, training and arrangement of credit facilities and re-stocking after droughts.

Farmers' Unions

There are three farmers' unions in Zimbabwe, namely the Zimbabwe Farmers Union, Indigenous Commercial Farmers Union and Commercial Farmers Union. Although these unions provide research and extension services to their members, emphasis seems to be more on crop production.

Research

Most livestock research used to be undertaken by the Department of Research and Specialist Services (DRSS), now part of Agricultural Research and Extension Services (AREX). Pig research is the responsibility of the PIB, animal health research is carried out by the DVS, while poultry research is done by AREX and poultry breeders. The University of Zimbabwe (UZ), Africa University (AU),

Midlands State University (MSU), National University of Science and Technology (NUST), Bindura University of Science Education (BUSE) and Zimbabwe Open University (ZOU) are also involved in livestock research. They co-operate with many multilateral and bilateral organizations.

It is generally accepted that technology is generated at research stations and transferred to farmers through extension. This model of technology transfer has not produced satisfactory uptake of many of the proposed technologies. Uptake has been low due to a number of reasons, which include weak links in the chain of message delivery, complicated messages and technologies that are inappropriate to the target group. These constraints have been recognised and have led to the on going restructuring of public research and extension services.

Education and Training

At least 63 training and education centres have the capacity to assist in human resources development in the agricultural sector. MoLARR is the major provider of various forms of agricultural training and education through its technical departments and divisions.

The UZ, AU, MSU, BUSE and ZOU conduct undergraduate and postgraduate degree programs in animal production, veterinary science and topics related to rural development. Agricultural institutes and colleges offer training programs that lead to the award of a certificate or diploma in agriculture. Other providers of training include Public Service Training Centres and the Ministry of Youth Development, Gender and Employment Creation. NGOs including some religious foundations provide training in agriculture on an *ad hoc* basis related to their particular short or long term objectives.

Infrastructure

Zimbabwe has a good infrastructure that enhances the development of AnGR. This includes livestock research stations throughout the country, marketing infrastructure (sale pens in the rural areas), livestock auction centres, public and private abattoirs, and extension and veterinary infrastructure. These are serviced by a good rail and road network as well as good communication through radio and the print media.

Policy on Management of AnGR

Long-term policy objectives for the agricultural sector as a whole are set out in the *Zimbabwe's Agricultural Policy Framework (ZAPF) 1995-2020*. However, there

is a need to develop a medium to long- term policy specifically on management of AnGR, which will address importation, screening, multiplication, distribution and use of AnGR. This policy should be in harmony with existing policies and regulations on Biosafety and Biotechnology.

Capacity building requirements

Capacity building requirements include:

- Setting up of Performance Recording Schemes for all species and covering all farming sectors. Support to current schemes has deteriorated substantially in recent years, with the performance recording scheme in cattle now virtually defunct. There will be need for strong financial and human resources to support and strengthen the existing schemes and to establish new schemes in those animal species where such schemes do not exist..
- Promoting and encouraging formation of farmer organisations and indigenous breed societies covering all farming sectors.
- Developing policy incentives (financial support and infrastructure development) for individual farmers, farmer groups and breed societies to promote sustainable use of indigenous AnGR. These incentives could be provided by farmers' organisations and/or by government, with possible support from donors and NGOs supporting the livestock sub-sector.
- Developing appropriate curricula for formal training at certificate, diploma, graduate and postgraduate levels in management of AnGR.
- Developing appropriate curricula for informal training including refresher courses for established farmers as well as research and extension agents.
- Training of farmers on water resources management techniques such as construction of small dams and shallow wells through government and/or donor support.
- Training of farmers on production, management and use of animal feed resources, home-grown and locally available feeds.
- Developing new technologies and strategies that suit the requirements and circumstances of the newly resettled farmers. The land reform program has in some instances resulted in changing production systems, resource allocation and species due to the changes in the size of land

holdings. Some of these changes need new approaches to livestock production, marketing and processing..

4. NATIONAL PRIORITIES FOR THE CONSERVATION AND UTILIZATION OF AnGR

The main national priorities for the conservation and utilization of AnGR are:

i. Livestock Breeding Policy

An enabling policy framework for livestock breeding needs to be developed to give guidelines on indigenous and imported AnGR, the need for their evaluation and screening prior to their multiplication and distribution to farmers. This policy should enhance the conservation with utilization of indigenous AnGR, promote creation of institutional structures to support conservation with utilisation, offer incentives for appropriate use of AnGR and harmonise policies to avoid conflict between stakeholders.

ii. Nucleus herds

Institutions that produce and multiply breeding stock for sale to farmers on sustainable basis need to be established, especially for the restocking programme. These multiplication centres could also produce crossbred genotypes appropriate for specific production systems. This is particularly important for beef and dairy production systems as well as for sheep and goats. Distribution of semen from improved and adapted animals of high genetic merit) for use in the smallholder and the newly resettled farming sectors should be encouraged. Currently, AI infrastructure is available in the country but it is confined to a few farmers, particularly those in the commercially dairy sub-sector in peri-urban areas. There is need to expand this service to cover a wider range of farmers.

iii Conservation

Animal breeding institutes or farms need to be established to conserve and sustainably use indigenous livestock breeds. Ideally, each species/breed should be kept in more than one location. Where a breed cuts across international boundaries, international collaboration should be considered. Establishment and enhancement of gene banks and embryo transfer of indigenous livestock species need to be considered. There is need to build the capacity of public research stations and private livestock breeding companies through financial and human resources development support. Where the animal genetic resources cut across

national boundaries, capacity could be built in collaboration with the relevant countries. International institutions could assist in the institutional capacity building.

iv. **Community Based Management of AnGR**

Community based management of AnGR needs to be encouraged, with government providing appropriate support services and incentives for communities to conserve indigenous AnGR. Grazing schemes will need to be considered in this regard. There is need to develop a *sui generis* system covering the ownership and use of indigenous AnGR. Such a system should recognize and protect the rights of farmers and communities, the protection of indigenous knowledge and protection of national AnGR from bio-piracy. Guidelines for formulating such policy and legislation are already available.

v. **Human Resources Development**

Training opportunities need to be created at all levels in order to sensitise the citizens on the value of promoting indigenous AnGR for the sustainable development of animal production and for poverty alleviation. The levels of training could include:

- Formal training at certificate, diploma, graduate and post graduate levels
- Informal training including farmer training, as well as short refresher courses for extension agents

Educational and training institutions need to develop appropriate curricula, which involve teaching and practical training in the identification, characterisation, conservation and sustainable utilisation of indigenous AnGR. Training in the use of AI for genetic improvement and/or conservation/preservation of AnGR should be encouraged.

vii. **Information Management System (IMS) for AnGR Conservation and Use**

An integrated IMS related to conservation and use of different breeds and species of farm animals needs to be developed, and to collect, process, store and disseminate information on conservation and use for all forms of farm livestock in all farming systems.

- Re-establish performance recording schemes on beef cattle, sheep and goats and extend the recording schemes to cover other species like pigs.

- Expand the Dairy Herd Improvement program to cover smallholder farmers.
- Strengthen the National FAnGR database at Matopos Research Station.
- Enhance the livestock identification and traceability programs in the country.
- Expand and promote the pedigree industry (Zimbabwe Herd Book and Breed Societies) to cover all species and farming systems.

viii. **Awareness of importance of indigenous animals**

There is a need to create awareness on the importance of indigenous AnGR in enhancing food security and sustainable development in animal production to farmers, researchers, extensionists, academics and policy makers. This awareness can be achieved through:

- Workshops on AnGR
- Wide dissemination of breed surveys results
- Wide dissemination of research results on breed comparisons

ix. **Molecular Genetic Characterisation of AnGR**

DNA-level studies to categorise livestock breeds in terms of gene maps and disease resistance are necessary. This will enable identification, estimation of population sizes, breed/type status and conservation of AnGR. This is particularly important for small ruminants, poultry and donkeys which have not been fully characterised. For those AnGR which cut across boundaries, molecular genetic characterisation would facilitate decision-making on mutual ownership, conservation, utilisation and access by the countries concerned.

x. **Herd Health Management**

Dissemination and application of herd health management practices (vaccinations, de-worming, dipping, identification/branding, record-keeping) for prevention rather than treatment of diseases especially for the newly resettled farmers should be intensified.

5. RECOMMENDATIONS FOR ENHANCED INTERNATIONAL CO-OPERATION IN FARM ANIMAL BIODIVERSITY

Zimbabwe shares some indigenous breeds with other neighbouring countries. Thus the Tuli breed is indigenous to Botswana and Zimbabwe, while the Nguni is indigenous to at least six other countries in the region. Many other breeds, such as the Boer goat and the Dorper sheep, are now common in many of the countries in the region. Cooperation in the conservation of AnGR that cut across political boundaries will be necessary. Such cooperation includes the following areas:

- Policies and legislation need to be harmonised to establish mutual ownership, protection and access to these shared AnGR.
- Cooperation with regional and international institutions and laboratories in research, technology and expertise.
 - Development of memorandum of understanding on the conservation, and utilisation of commonly shared FAnGR.
 - Exchange visits and secondment of scientists and technical expertise.
- Improved capacity to detect trans-boundary diseases and to certify freedom from such diseases, so as to facilitate trade in AnGR. This should result in international accreditation of local veterinary testing laboratories.
- Information sharing, including training through regional and international conferences and workshops, exchange programs at post-graduate level, visits and scientific publications.

6. HOW THE COUNTRY REPORT WAS PREPARED

Introduction of the Zimbabwe Country Report

The National Consultative Committee (NCC) comprising the National and Alternate Coordinators of the Management of Farm AnGR project, the Technical Secretary and members of the Livestock Commodity Sub-Committee (LCSC) of the Agricultural Research Council (ARC) was constituted in September 2001. The NCC comprised the following:

Chairperson: to coordinate and chair all NCC activities

Technical Secretary: to monitor and manage the work of NCC members, draft and circulate working documentation, and maintain the national databank on AnGR for contribution to the State of the World's Animal Genetic Resources (SoW-AnGR) databank.

NCC members: to actively participate in the preparation and development of the Country Report (CR).

A Consultative Workshop of the NCC and stakeholders was held in April 2002. Thirty seven participants attended the workshop. From the workshop participants, two teams were formed to develop and prepare the CR. The first team (referred to as the "Focal Points Team" (FPT)) comprised seven subject matter specialists who were given the task of coming out with the relevant Background Questions (BQs) and other information on cattle, goats, sheep, pigs, poultry and donkeys, and "other species" such as ostriches, rabbits, horses, ducks, geese and turkeys. These species were considered to be important to food and agriculture in the Zimbabwean context. For each species, the Terms of Reference (TORs) for the FPT members were to collect and collate information and data on Production Systems, State of Genetic Diversity, Utilization, Conservation and Policy Development, and Institutional Arrangements for these species. The FPT members were required to send soft or hard copies of the information and data referred to above to the Technical Secretary.

The second team (referred to as the "Writing-up Team" (WUT)) comprised editorial specialists. The TORs of the WUT were to:

- Analyse, synthesise and verify information and data provided by the FPT through the Technical Secretary.
- Write up sections of the CR covering: Assessment of the State of Agricultural Biodiversity in Farm Animal Sector; Analyses of the Changing Demands on

National Livestock Production and Implications for Future National Policies, Strategies and Programs related to AnGR; Review of the State of National Capacities and Assess future Capacity Building Requirements; Identification of National Priorities for Conservation and Utilization of AnGR; and Formulation of Recommendations for enhanced International Co-operation in Farm Animal Biodiversity.

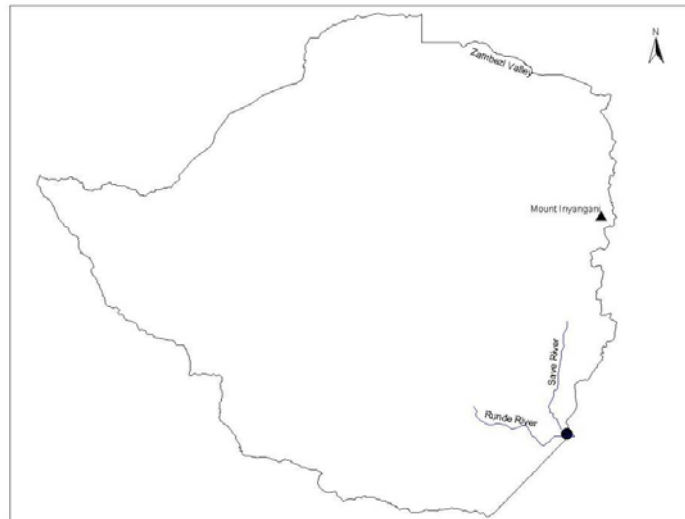
- Forward the written-up sections referred to above to the Technical Secretary of the NCC.
- Attend consultative meetings of the WUT and the Final National Consultative Committee/Stakeholder Workshop for review of the Draft CR.

Data and information were collected from July to September 2002. The WUT members began the process of compiling, analyzing and synthesizing the data and information and writing up the CR in October 2002. The WUT held two meetings to draft the CR. After completion of the Draft CR, copies of the document were sent to stakeholders who had attended the initial meeting. Stakeholders were requested to comment on the Draft CR and to suggest improvements. A Final National Consultative Committee/Stakeholder Workshop was held in November 2002 to review and discuss the Draft CR. Sixteen stakeholders managed to attend the workshop. The stakeholders presented their suggestions, comments and contributions and these were incorporated in the Final CR. A third and final meeting was held in January 2003 to finalize the CR. It was difficult to get accurate statistics required for the Predefined Tables, hence these were not included in the CR.

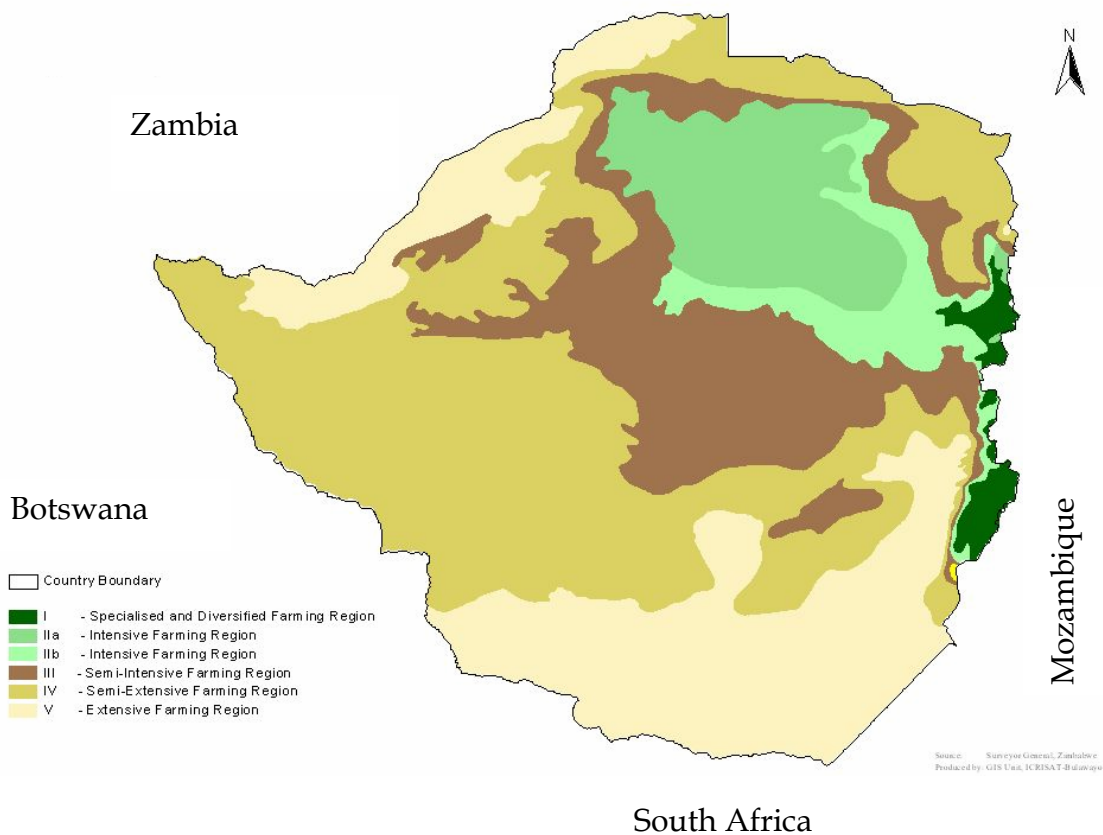
The names, institutions and addresses of the persons involved in the development and preparation of the CR are shown in the Annexes.

ANNEXES

Annex 1: Map of Zimbabwe showing highest (σ Mount Inyangani) and lowest (λ junction of Runde and Save Rivers) altitudes.



Annex 2: Map of Zimbabwe showing the Agro-ecological Zones.



Annex 3: Literature Consulted

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Annex 4: List of participants at the First NCC/Stakeholder Workshop (April 2002).

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Annex 5: Names, institutions, roles and addresses of persons involved in the preparation of the Zimbabwe Country Report.

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