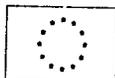

BOTSWANA



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Front cover:

Pumping water in a rural area. Water is an important resource in Botswana and Botswana recognise the need to use it carefully.

Opposite:

Zebra in Nxai Pan National Park. Zebra is the national animal.

Overleaf:

Homestead near 'the lands'. Over 70 per cent of the nation lives in rural areas.

The Nature of

BOTSWANA

A GUIDE TO CONSERVATION
AND DEVELOPMENT



The Nature of Botswana is the fourth volume in a series of information books about conservation and development issues around the world. Called The Nature of . . . series, it is not a profit-making venture, but forms part of the education and awareness work of IUCN's Field Operations Division. This edition was produced in partnership with the Kalahari Conservation Society.

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The Nature of Pakistan
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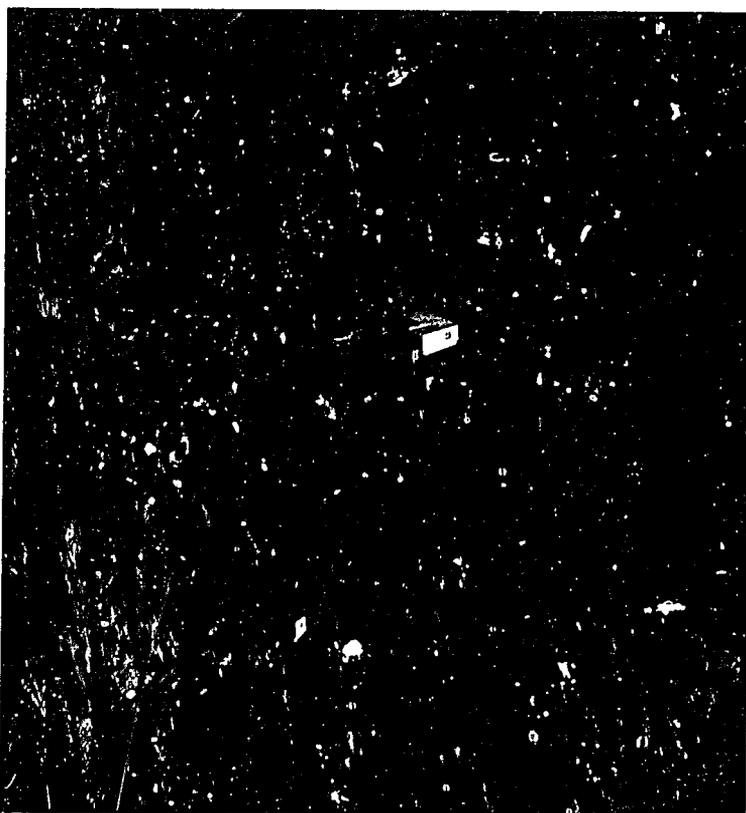
In preparation:

The Nature of Costa Rica
The Nature of Jamaica
The Nature of Kenya
The Nature of Panama



Founded in 1948, the International Union for Conservation of Nature and Natural Resources (IUCN) is the world's largest and most experienced alliance of active conservation authorities, agencies and interest groups. Its 650 members include States, government agencies and most of the world's leading independent conservation organizations, in 119 countries.

The Field Operations Division (formerly the Conservation for Development Centre – CDC) is the entrepreneurial arm of IUCN. It specializes in the application of conservation principles to the process of economic development. Since CDC's establishment in 1981, IUCN has become known worldwide for its work in ensuring that the utilization of natural resources is done on a sustainable basis – ultimately to yield greater benefits for mankind – rather than for short-term gain. A small staff of under twenty, based in Gland, Switzerland, coordinates a worldwide network of consultants and experts for this work and is currently establishing regional centres in a number of developing countries.



The Kalahari Conservation Society is a non-governmental organization committed to the wise use of Botswana's natural resources. It is a member of IUCN, and is frequently consulted by international organizations on issues concerning Botswana's environment.

KCS aims to increase knowledge of Botswana's wildlife resources and environment through education and publicity; to encourage research into resource and conservation issues, and to promote conservation policies.

A message from the President

"The Nature of Botswana is written for people who care for their country. Thus, it does not only celebrate the great natural beauty and diversity of Botswana; it seeks to open eyes and minds to the dangers of environmental damage that grow daily around us. The underlying theme of the book is that each and everyone of us has an impact on the environment, and that we therefore have a responsibility to ensure that we use our resources wisely. This is the message which I urge you to take and act upon in your daily lives."



Dr. Q. K. J. Masire, M.P., N.Y.B.,
President of the Republic of Botswana
and Patron of the Kalahari Conservation Society



Cattle numbers before the 1980s drought exceeded three million, six animals per sq km compared to about one and a half persons to the sq km.

*F*oreword

In the beginning when God created the universe, the earth was formless and desolate. Then God commanded, 'Let there be light' and light appeared. God was pleased with what he saw. Then God commanded, 'Let the earth produce all kinds of plants, those that bear grain and those that bear fruit' and it was done. God was pleased with what he saw; and God created every living creature that moves and every winged fowl and God saw that it was good.

That is the heritage humankind received from God. A planet covered by plants of all kinds and all types of animals. They were meant to ensure the good living of man and the animals that God had created.

How have we looked after this priceless heritage? That is the question we have to address. Can we, in good faith today, say that God can be pleased with what he sees? Has humankind ensured that the earth retains the form in which God gave it to us? I am afraid not. If current trends of resource utilization or abuse continue, the earth will soon be formless and desolate as in the beginning. And God will certainly be unhappy. And we shall be the worse for it.

Today, if we could ask the children of a thousand years hence what they would like to be when they grow up, they might answer: 'Alive, and able to enjoy all the things you had, the clean air and pure water, the fertile soil and the minerals, all the plants you had, and all the wild animals.'

Are we ready to pick up the challenge to ensure sustainable developments? I hope and urge that we should. There is no other way. The question is, what is the way forward?

Only through wisely using our resources of air, soil, water, minerals, plants and animals can we improve the quality of our lives, and only by ensuring that adequate supplies of resources remain available for the needs of future generations will we know that developments are going to be sustainable.

To achieve this, all resources should be used in the best possible ways. We should use our resources without reducing their annual productivity. If anything, we should strive for an increase in annual productivity of our resources.

Only 100 years ago, eastern Botswana was filled with zebra and impala as well as many other species, but today, they are gone, except for a few on freehold land. Rock paintings, place names and oral history all describe a country of tall trees, large animals and open plains. Today, in eastern Botswana, only a few wild animal species remain, mostly on freehold land, and most of the large trees are no more. As population increases and even greater pressures are brought to bear on the land, so resources will continue to disappear. Is this what we want? Do we want to leave for our offspring a formless and desolate Botswana? I hope and pray not.

Through appropriate conservation strategies, involving all sectors of our population, we can make Botswana a happy place. All the large trees and big animals can be resuscitated. I urge us all to take up the challenge. With dedication and seriousness of purpose we can make Botswana the beautiful country it was only 100 years ago. And, no doubt, God will be pleased.

Hon Dr GKT Chiepe
Minister of External Affairs and President of the Kalahari Conservation Society

Sir Seretse Khama, first President of the Republic of Botswana, whose ideals of fairness and democracy prevail in all we do, and whose government recognized sustainable development as one of the four principles to be incorporated in all planning for the future.



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Introduction

WHICH WAY BOTSWANA?



*L*ooking from the Moon

In 1969, Neil Armstrong stepped off the surface of the Moon and climbed into his spaceship for the return to Earth.

Plunging towards our planet, and with Earth growing bigger and bigger, he could see the whole continent of Africa; he could see all Botswana at a glance. At that moment, he realised that the size of our world is limited.

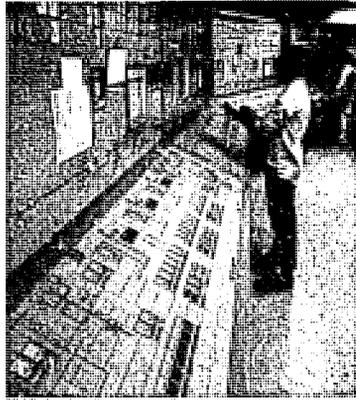
He could see the boundaries of all our soils, waters, plants and animals, and he knew that if they vanish, there is nowhere else for us to go. It was like holding an orange in his hand; once eaten, it was gone.

The future of our planet is in our hands. If the children of a thousand years hence are to enjoy all the things we have today, it is up to us to make sure that the clean air, the pure water, the fertile soil, the minerals and all the plants and animals we have will remain for future generations.



Opposite:
The Kalahari covers about 84 per cent of Botswana. Its sand dunes are well vegetated, but it lacks surface water.

Left:
Our planet from space. (NAH)



The Book and its Purpose

How special is our planet, and how special is Botswana? Worldwide, concern is escalating over the so-called greenhouse effect, disappearance of rain forests, spreading deserts, loss of animal and plant species, pollution on a frightening scale, and an ever-increasing world population which will soon number six thousand million people, more than one for every year of our planet's existence. Can we afford to allow our life support systems, soil, water, air, animals and vegetation, to be eroded and disappear? If we do, we are destroying ourselves, for there is nowhere else to go.

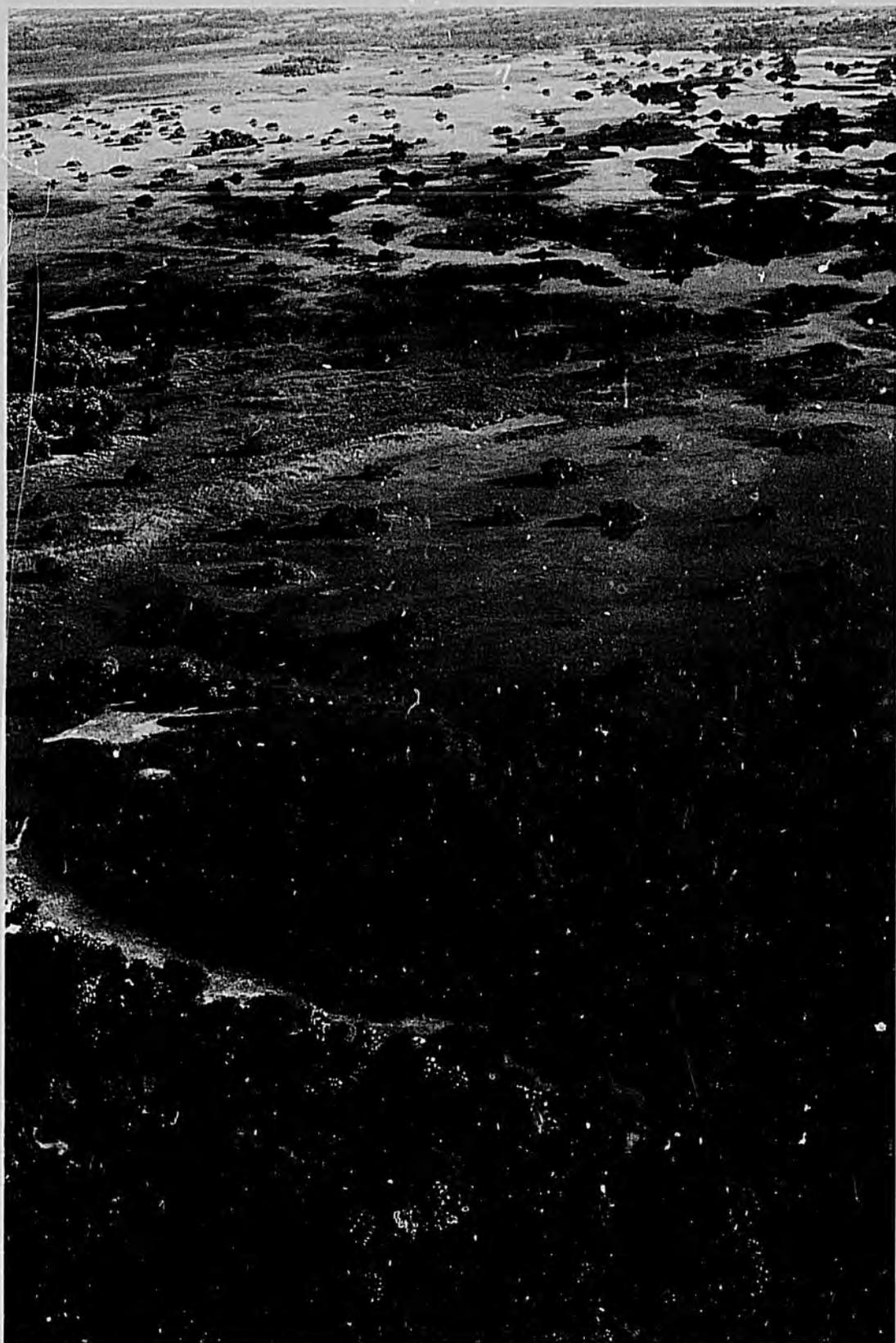
This volume, one of a world series, focuses only on the nature of Botswana and has been prepared with its individuality, its needs and its people's aspirations held firmly in mind. Even so, we are a part of the world, sharing our climate and waters with neighbouring countries and possessing unique features such as the Okavango Delta, which are a part of the world's heritage. We have a duty to hand on to our children a land in better shape than we found it, and to all the nations of the world a duty to protect our shared assets and unique features.

This book has been written for everyone, including people who know little or nothing about Botswana, but it is aimed primarily at Botswana's younger generation who will be the decision-makers and major consumers of tomorrow (more than 60 per cent of the entire population is under 20 years of age). Readers should not be depressed by the emphasis on problems, since there would be no book if there were no problems. For these reasons, the book is written in a clear and comprehensible style and designed to appeal to the young. The illustrations and their captions tell most of the story while the text covers the issues in greater detail. Its message is equally important for all.

Environmental problems lie not with the rich, nor with the poor, but with all of us. If the poor scratch a living from the soil, creating vegetation problems and erosion, so the rich in the towns use sixty times as much energy as the poor. We are all involved. Only by recognition of this fact and personal commitment from everyone will the problems be solved.

The aim of this book is to look at the nature of our land, to recognise our resource problems and the issues involved with them, to view the opportunities for putting them right, and to examine some of the ways this can be done. The book recognizes that environmental conservation and sustainable development are intimately related and that one cannot exist without the other. By so doing, benefits flow in every direction: the range improves, there are assets for all, employment is created in every area and the quality of life improves for everyone.

What should we do as individuals, as employees or employers, as planners or administrators, alone or with others? This book offers some answers: opportunities for involvement range from simple actions like picking up litter to the complicated planning process of conducting Environmental Impact Assessments.



Chapter One

BOTSWANA: THE LAND AND ITS HISTORY



Shape of the Land

Botswana lies squarely on the Southern African plateau, 950 metres above sea level and over 600 kilometres distant from the nearest coast. It is primarily a flat land of endless savanna, but also one of sudden contrasts. In the east, firm soils, rocky outcrops and ephemeral rivers rapidly give way westwards to the gently rolling dunes of the Kalahari; and in their midst are the lush delta of the Okavango and the swamps of the Kwando River. In the basin of the Kalahari lies the huge dead lakebed of Makgadikgadi, endless expanses of smooth, shimmering brine.

Earth-coloured, arid landscapes change over night to verdant green as blue skies fill with cloud and drench the dry soil. Cool days and cold nights of winter give place to the heat of summer. Years of good rains are succeeded by years of drought in an endless cycle.

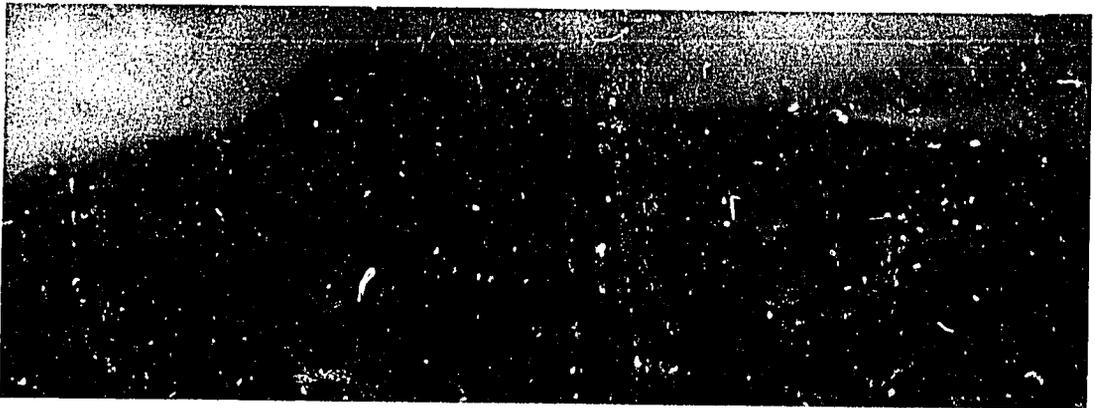
The well-wooded areas of the north, rich in plant and animal species, fade towards the south and west into more arid lands with fewer plants, and animals adapted to drier conditions.

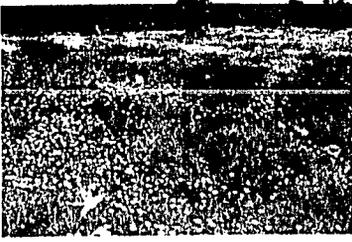
Opposite:

Into the permanent swamp of the Okavango Delta flows on average 11 billion cubic metres of water a year. This is enough for all the needs of an industrialized nation, yet 97 per cent of it is lost in the hot desert sun.

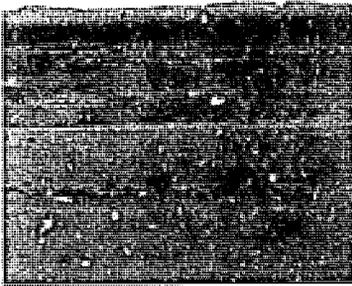
Below:

Baratani Hill and an approaching storm. The eastern hardveld supports 80 per cent of the population on its firmer soils. Erratic rainfall during summer months makes agriculture difficult.





Top left:
The desert blooms after a storm. Looking east towards Ngeako Pan.



Above:
Ploughed fields in the eastern hardveld where soils are firmer. About 70 per cent of the population grow crops, although drought and attractions of urban life tend to impede problematic rainfed agriculture.

Above right:
The Okavango Delta, 15,000 sq km of swamp, floodplain, island and lagoon, set in the dry Kalahari Desert. It attracts tourists to view its unblemish and wildlife.



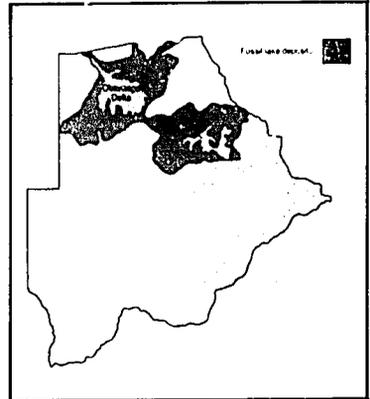
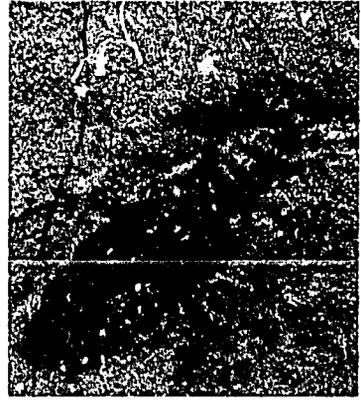
Desert and Delta

When rains come in October, and even before they arrive, the dry thorn-trees of the Kalahari bloom and the pale brittle grass, which has protected the gently rolling dunes from the hot sun, sprouts green above the sand. Dark clouds build up on the horizon, lightning flickers and the first large drops fall into the orange sand. In a moment, the wind comes, the heavens open and rain thunders down until small trickles of water wend their way across harder ground, forming shallow pools on pan floors, the first surface water seen in this dry land in seven long months.

Pula means rain, and rain is life. With rain, cows grow fat, calves give milk, corn sprouts green, the wild herds of the Kalahari follow the lightning, grazing on new grasses, and the veld blossoms bringing forth a bewildering array of wild foods for both man and beast. So valued is rain that its name has been given to the local currency with one hundred shields, *dithebe*, making one *pula*.

But the Kalahari is a hard land of windblown sands, the longest unbroken stretch on earth, and it covers over four-fifths of Botswana. Its local name, *Kgalagadi* or *Khalahari*, depending on dialect, was corrupted by Europeans in the 19th Century to Kalahari Desert. Its very name, *Khalagari*, The Great Drying Up or The Great Thirst, implies a desert; yet it is so only in name, for its impermeable sands hold moisture, giving life to grasses, herbs, succulents and woody plants.

Into this dry land flow the Okavango and Kwando Rivers. The Okavango spreads over a 15,000 sq km delta lying on a rift now filled with sand. The Kwando is caught by the same rift, spreads through an area of swamp, breaks into Lake Liembezi, and, as the Chobe, flows eastwards to join the Zambezi River. Each year, the Okavango brings down some 11 billion cubic metres of water, sufficient to supply more than the whole country. Yet most of it is dissipated in the Delta through evapo-transpiration and only three per cent sometimes emerges in the east to flow into the Boteti River.



This is the miracle of Botswana: Southern Africa's third largest river feeding a swamp in a land of sand. Because of its aridity and windblown sands, its size and difficulty of access, much of the Kalahari remains wilderness, inhabited by animals adapted to its nature, and by hardy people who understand its vagaries and eke out a living from its dry soils.

Above left:
The Okwa Valley, once a mighty river which helped to fill the prehistoric lake of Makgadikgadi, lost its flow as the climate became drier and is now partially filled with windblown sand.

How it was Formed

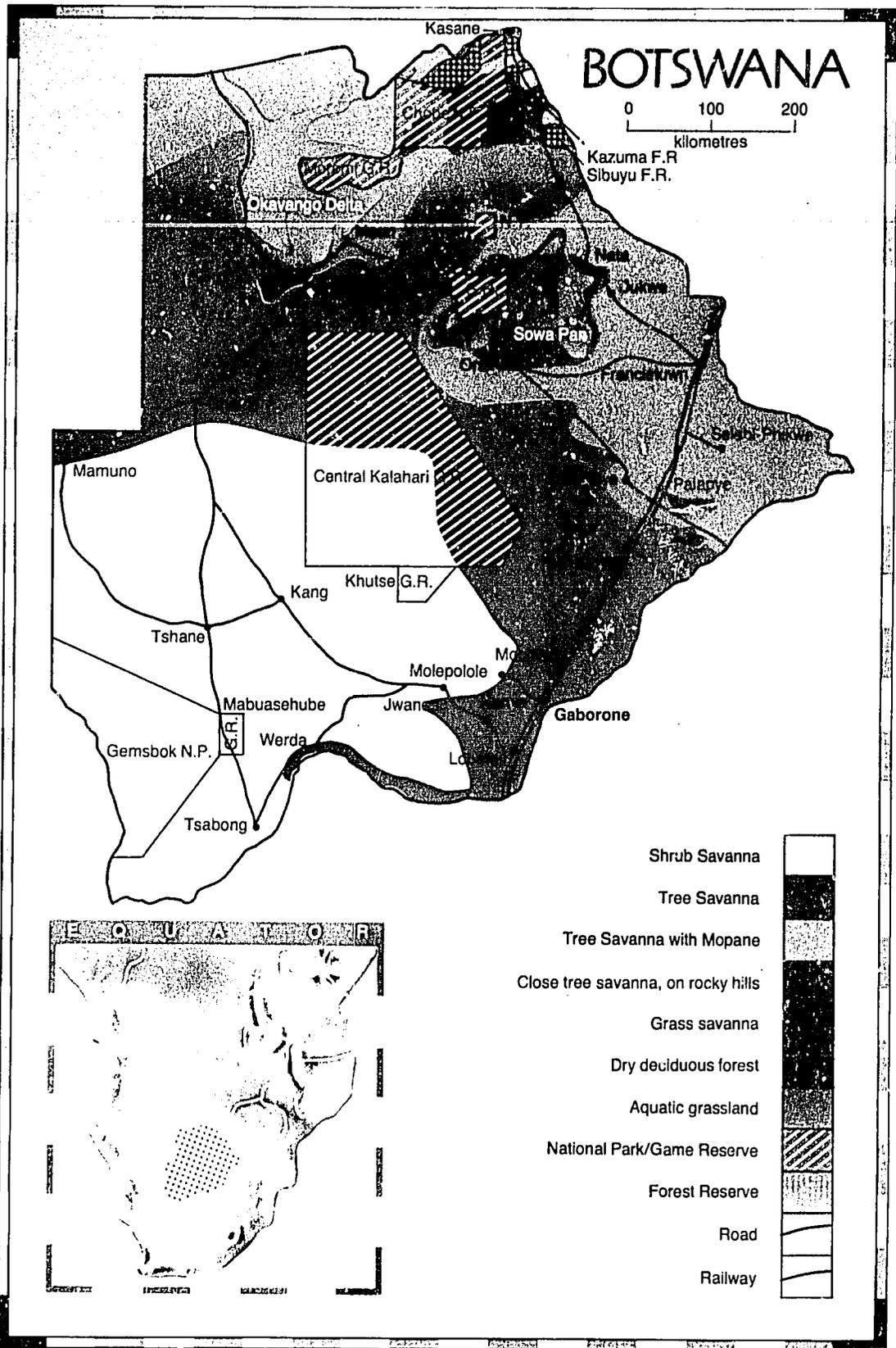
Top:
A fossilized insect from the sediments resting on the Orapa diamond pipe suggests a wetter climate 90 million years ago.

More than 200 million years ago, this land lay at the centre of a vast super-continent, Gondwanaland, which split apart to form new continents until Africa stood alone some 100 million years ago.

Above:
The ancient lake of Makgadikgadi once covered much of Northern Botswana.

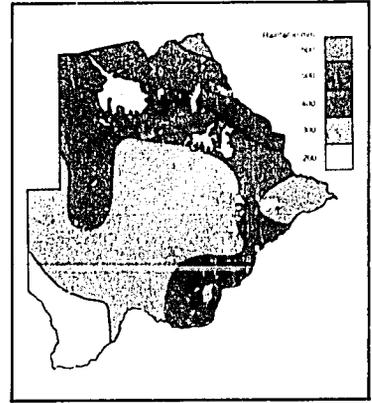
Strong winds, blowing back and forth for millions of years, spread sands across Southern Africa to form the modern Kalahari. About 90 million years ago, volcanic action built huge pressures beneath the sands, forcing upwards gushes of gas and volcanic materials which burst through the surface. In this 'kimberlite', are found the diamonds which today are changing the face of Botswana.

More recent world changes in climate also helped to shape the land. It is thought the Okavango, Kwando and Zambezi once joined to form a vast river which flowed down the Boteti, into the Motloutse, to the Limpopo and so to the sea. An upward warp of the land west of Francistown pooled the river backwards, forming a lake larger than Victoria in East Africa. Such a lake could only have formed if rainfall was perhaps four times greater than that of today. Rivers like the Okwa and Naledi then flowed across the Kalahari which was covered with tall forest. Declining rainfall changed forest to savanna and dried up desert rivers. Movement of the earth's crust produced faulting which has altered the direction of river flows. The Zambezi was captured by its present valley and directed away from Botswana. As a result, the water supply to the lake steadily diminished and a thousand years ago the lake had become dry.

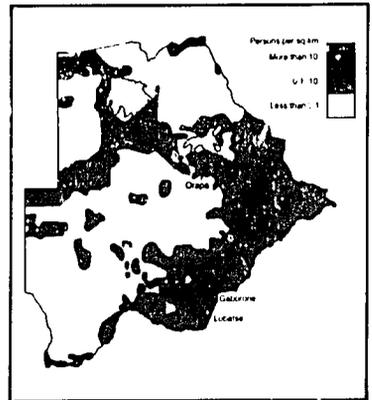


Botswana at a Glance

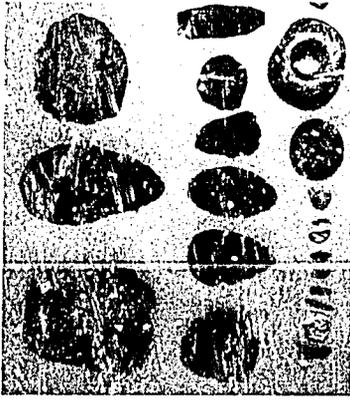
- Botswana:** Landlocked democratic republic in Southern Africa.
- Total area:** 581,730 sq km, about the size of France or Kenya.
- Neighbouring countries:** Zambia, Zimbabwe, South Africa, Namibia.
- Nature:** A flat country with little surface water and 84 per cent covered by Kalahari sands.
- Altitude:** An average 950 metres above sea level.
- Climate:** Divided by the Tropic of Capricorn: in the north tropical, in the south sub-tropical. Rain falls in summer between October and April. Winter months are dry and cool. Mean temperature is 24°C, but in summer it can rise to over 40°C and in winter night temperatures can fall below freezing. Long periods of below average rainfall intersperse periods of above average rainfall in an approximate 20-year cycle.
- Major features:**
- | | |
|-------------------|---------------|
| Kalahari Sandveld | 435,600 sq km |
| Okavango Delta | 15,000 sq km |
| Makgadikgadi Pans | 14,000 sq km |
| Eastern Hardveld | 146,130 sq km |
- (Note: The Okavango Delta and Makgadikgadi Pans fall within the Kalahari)
- Population:** 1.3 million (1990 estimate) with 3.5 per cent annual growth rate.
- President:** His Excellency, Dr Q K J Masire.
- Capital:** Gaborone in the southeast. (Population 125,000, 1990 estimate)
- Natural resources:** Diamonds and some semi-precious stones. Coal and Soda-ash. Copper, Nickel, Manganese, some Gold and other minerals. Savanna capable of supporting large numbers of wild and domesticated animals. Wildlife including 164 mammal species, 550 birds, 80 fish, 157 reptiles and 38 amphibians. Veld products, numerous edible and some medicinal species. Water, unevenly distributed, fossil, saline and potable groundwater, with major surface supplies only in the northwest.
- Main exports:** Diamonds, Copper-Nickel, Beef, Soda-ash, Textiles.
- Crops:** Maize, Sorghum, Millet, Beans, Melons, Squashes, Groundnuts, Gourds, Sunflower (and some Cotton).
- Livestock:** Cattle (2.6 million) goats and sheep (about 2 million), donkeys and horses.



Mean Annual Rainfall



Population Density



Out of the Earth

Man-made stone tools, some over 300,000 years old, have been found throughout the country, suggesting the whole land has been inhabited, even if sporadically, for a great length of time. The earliest known modern inhabitants are the ancestors of the San, locally called *Basarwa*.

Agricultural practices entered northern Botswana about 2,000 years ago, bringing first sheep and cattle. Goats and crops like millet, sorghum and gourds followed with knowledge of pottery and metal-workings, new forms of political organization and long-distance trade.

At first, the new arrivals lived in scattered communities, but complicated organizations developed with those rich in cattle living on hilltops and their followers scattered below them. By AD 900 mini-states began to form, stretching from Sowa Pan eastwards across the Limpopo, and in the northwest around Tsodilo Hills. They grew rich in livestock, lasted 300 years and then collapsed, perhaps through increasing population, overuse of the land and drought.

Within 100 years, new states arose in western Zimbabwe and spread far into Botswana. The upper Shashe River was populated by ancestors of the Bakalanga who grew crops, mined iron, copper and gold, hunted elephant, traded and formed an important production area of the Great Zimbabwe State.

In the south, groups of farmer-herders, known by science as 'agropastoralists', spread westwards into Botswana and the fringes of the Kalahari. These may have been early ancestors of the Bakhalagari who were soon followed by Bakwena, Bangwaketse, Bangwato and other Botswana groups.

An archaeologist described this southern influx as:

A movement of peoples, each with its single settlement and herds of cattle. They grew crops, hunted, collected wild food, split up when they became overlarge, and moved frequently to new water and pasture as land became less productive.

By 1885, when the land was declared a British 'protectorate', these communities or states had become so large that most of the better land was occupied, common boundaries recognized, and further movement greatly restricted or impossible.

The Protectorate brought together many different peoples within a common boundary and established the borders of a new nation, the Bechuanaland Protectorate which, in 1966, was to become the Republic of Botswana.

During the years of protection, Britain could afford little interest in a country seen as a sparsely populated desert, lacking in both mineral resources and water, and having no obvious potential for development. Some attempts were made in the 1930s to locate groundwater for an increased livestock industry which would export beef and cattle, and a little manganese and asbestos mining started in the southeast; but always powerful South Africa was seen as a neighbour which could incorporate Botswana.

At 'Independence', little had been done. As one planner said:

We have got to catch up on a hundred years' lack of development in the next ten. We've got a single-track railway through the east of the country, owned and managed by our neighbours, no tarred roads, few schools, poor health services and an industry based only on cattle. But we have ourselves and we must get on with it.

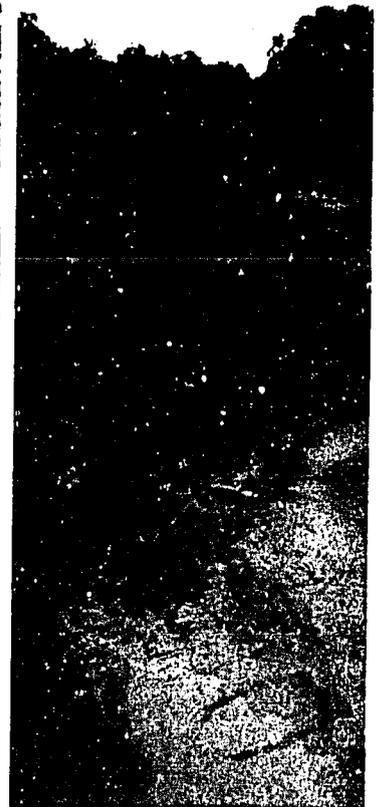
The next two decades were to see staggering developments: diamonds, coal, and copper-nickel mining, new roads and airports, new dams, a vastly expanded cattle industry, a small textile industry, new Parks and Reserves, growing tourism, massive water development, new schools and hospitals, new abattoirs and a new capital at Gaborone. It also saw the population double in size.

Top:

The Stone Ages lasted for perhaps two million years with the last stone tools being made in the 17th Century or later. With time, large chipped tools were replaced by much smaller ones with a wide variety of uses from arrowheads to drills, from scrapers to sickles.

Above:

Ancestors of Baswana started to build in stone in the 15th Century. Settlements grew large covering hundreds of hectares. Today, there remain complexes of stone-availing which once enclosed homes, dikgotla and stock kraals. Seoke (from seoka, a huge my animal beast), situated just northeast of Lobatse, was occupied by the Bangwaketse in the late 18th Century.



In the Beginning

Different peoples have different stories concerning their origins. For instance, the Hambukushu believe that God, *Nyambe*, lowered their ancestors and cattle on a rope from heaven to the top of the Tsodilo Hills, and point as proof of this to skid marks which they say were made in the wet rock by the cattle's hooves.

The San recognize two gods. One is a creator who made the earth, animals, plants and people, and the other is a trickster continuously causing trouble. They believe that to harm unnecessarily the creator-God's possessions also brings harm on themselves.

Culture is an anchor; it provides a base on which to build our lives; it is the roots of our existence. Culture also gives us national pride and its firm evidence should be preserved for the appreciation of future generations. The physical aspects of culture: archaeological remains, traditional settlements and rock paintings are also an important tourist attraction, bringing people from afar to enjoy our country and spend valuable foreign exchange.

Left:

3,000 rock paintings at Tsodilo Hills testify to long occupation by the San or Basarwa. Images of stick-like people, wild animals, domestic cattle, and strange designs express San relationships with the natural and supernatural world. Excavations in the hills suggest that cattle had arrived in the area by AD 550. (AC)

Above:

Ka setswana or according to our traditional beliefs, Matsieng, a one-legged giant, lived at the time of Loue (shortly after the 'creation'). He dwelt beneath the ground with the ancient peoples, ancestors of Batswana, holding up the surface of the world lest it fall and crush them.

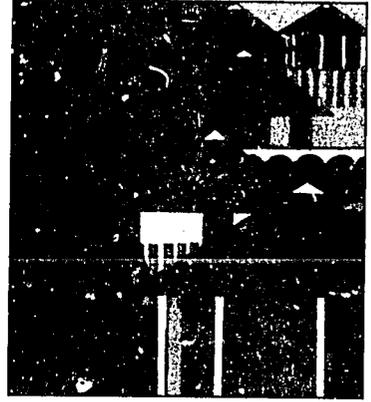
One day Matsieng heard the song of birds and, looking upwards, saw the sky through a hole in the surface of the earth. Climbing out, and followed by his people and all the animals, Matsieng left a line of footprints in the soft rock as he walked forward to a new life beneath the sun.

The hole in the rock is situated three kilometres north of Ravesa and many engravings of a single footprint attest to the legend. Such a creation site validates Tsuana claim to the land, although the etchings are probably of San origin.



Chapter Two

OUR WAY OF LIFE



Peoples of the Land

A visitor coming to Botswana was heard to remark, 'Everywhere I go, I see young people, particularly school children; where do they all come from?'

There are many young people in Botswana. Half of the entire population is aged less than 15 years. It is a growing population and will continue to grow. Only 25 years ago, there were just over half a million people. The 1991 census will probably count almost one and a half million people, three times the number counted in 1964.

By the year 2010, official estimates are looking at two and a half million people; five times the number there were only 25 years ago.

'How is this possible, a population which multiplies by five times in 50 years?' the visitor asked. The answer is simple: a growth rate of nearly 3.5 per cent each year, improved health facilities, declining infant mortality, increasing life expectancy, and a very young population.

'Do you know?' the visitor was told, 'on average every woman gives birth to six babies; that is why our population is growing at such a rate.'

'And where do you all live?' he asked. 'There seems to be lots of space, but I hardly saw anybody in the west of the country.'

Where does everyone live? About 70 per cent of the population live in rural areas subsisting off agriculture and a little stock raising. Many people must leave home to find cash employment. Urban areas are growing fast, by more than 10 per cent each year. The capital has over 100,000 inhabitants. It is new towns like Gaborone, Selebi-Phikwe and Jwaneng which grow faster than old ones like Lobatse and Francistown.

'What will happen in the future? Will the towns just grow and grow, or will the rural areas also develop?'

Population density varies greatly throughout the country. In some rural areas, there are 30 people to the square kilometre, while in places in the Kalahari, there are thirty square kilometres to each person. Most people live on the better land in the east, often in large settlements. As the population grows, these settlements change their nature from being rural to becoming urban.

Who can guess how big the population will be, where people will live, and what they will do by the year 2010?

Opposite, top left and centre:

Children number far more than half of the entire population. The average age is 15 years and 9 months, one of the lowest in the world.

Opposite, top right:

Bored in rural areas where there is little to do, school dropouts head for town trying to find any type of work. Lack of opportunities puts some on the streets. Only employment in rural areas can alter this situation.

Opposite, bottom:

The Government offers free education and its aim is to provide a place in school for every child. Increasing population requires constant school expansion. To contain present growth, the school system must double within 18 years.



Top:
People derive their own entertainment. In rural areas there is little for young people to do and all day in which to do it.

In a minute, a piece of wood, some wire, some glue and a lot of skill make a guitar. This young Osho is a very skilled guitarist able to play a wide variety of traditional melodies on his home-made instrument.

Above:
Jobs are scarce in rural areas, particularly for young people. Mostly, they involve part-time work during the agricultural season. This young man has a good job herding cattle for one of the ranchers in Ngamiland. Often the cattle become lost during the rains. There is water everywhere and they do not come to the borehole to drink. The horse helps me to find stray cattle in the bush.

Top:
A Game Scout of the Department of Wildlife and National Parks. Our work is very varied depending on our station. We are both public relations officers and policemen, clerks and researchers. We man the gates of National Parks; sometimes accompany visitors to help them enjoy all the things the area has to offer; perform patrolling duties both within and outside protected areas; keep a constant watch for poachers, walk transects and record wildlife and vegetation information; issue licences to hunt and check trophy dealers. We are trained at Maun Wildlife Training Institute and also receive in-service training mainly from senior staff. There is one major problem: the country is very large and there just are not enough of us to cover it.

Above:
The Ovambandeni were some of the first pastoralists to settle in Namibia. After the German-Herero War of 1904-5, Ovaherero and Ovambandeni escaped to settle in Botswana. Traditionally, they lived off their cattle herds and did not plough. Strict traditionalists, women wear long dresses introduced by missionaries in the 19th Century which, for them, have become traditional dress. Once refugees, they are now Botswana citizens of their adopted country.

Top:
I live on the lands near the Taung River in the South-East District. Yes, this is my child, the youngest of them all. For women, children are a great source of pride. On average, every woman bears six children, although not all will grow to adulthood. The population is increasing at about 3.5 per cent each year which means that it will double itself within twenty years.

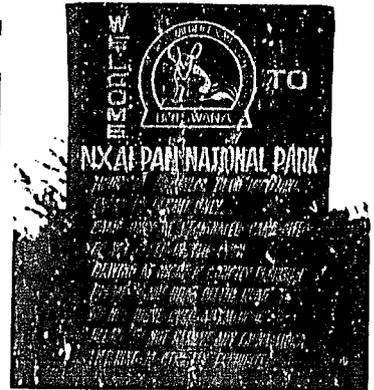
Above:
'What future is there for my children?' asks a Remote Area Dweller of Khoisan stock. There are over 40,000 such people who have lived by collecting wild food, raising a few goats and sometimes cattle, and by hunting. The extension of ranching through the Kalahari reduces areas available to them. Government schemes offer health and education services but little land and no employment.



Left:
Livestock graze over almost 60 per cent of the country. About half of all families own some cattle, although 5 per cent of the population owns about half of the national herd.



Below left:
New towns, roads and wealth have changed the face of the country. Garages are found in every main centre servicing transportation throughout the land.



Above:
Entrance to Nxai Pan National Park, east of Maut, part of the Park and Reserve system which covers 17 per cent of the land.

*P*atterns of Landuse

Most people live on tribal lands, inheriting rights of use which cannot be sold, entitlement to build homes and plough, and common rights to herd cattle. They may freely collect natural resources for personal consumption, wild food, building materials, medicinal plants, firewood, fish and unscheduled animals such as hares; for them hunting licences were only introduced in 1967.

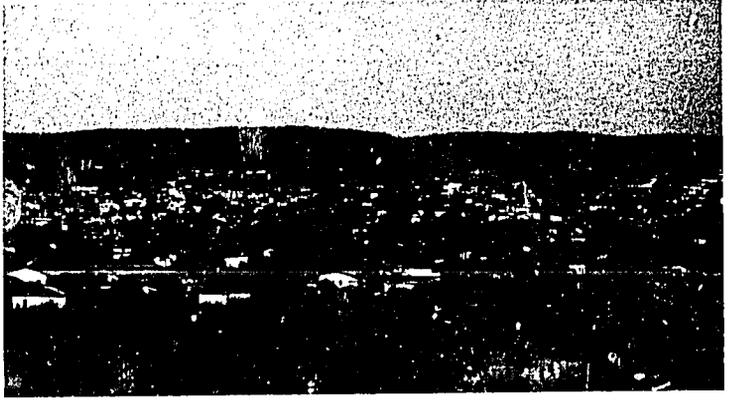
Traditionally, all land was tribally owned. During the Protectorate period, some land was allocated for State use while a very little was declared freehold and sold to individuals. During the last two decades tribal lands have increased, and a few farms have been added to freehold areas, both at the expense of State Land.

The country is divided into ten districts for administration conducted through Central Government, District Councils, Land Boards and Tribal Authorities. Landuse planning is initiated at district level and centralized in the Ministry of Local Government and Lands.

Increasing population is creating land shortages and in some areas it is now difficult to obtain ploughing land or a place to sink a borehole for stock-raising. Land cannot be sold and, if abandoned, returns to the tribe for reallocation by the Land Board.



Top right:
Molepolole, capital of the Kweneng houses some 50,000 people and is turning from a rural settlement into an urban area



Bottom right:
Sprawl around Molepolole are agricultural lands, where temporary homes are becoming more permanent as people shift their residence from capital to farm

Above:
Homesteads and land areas are being grouped into villages with supplies of borehole water, and access to schools and health facilities.

Traditionally young girls have played an important part in agriculture, but today education is taking the young from rural areas to swell urban population.

My Village

My grandfather says the village moved when he was a small boy, but only from one side of the hill to the other. He says his grandfather told him it moved all the way from Dithejwane when he was young; so Molepolole is not so old.

We live in a *lohwapa* or courtyard with a stone wall between the *kgotla* and the District Commissioner's offices. My uncles live close to us and all the people in the area seem to be related to each other.

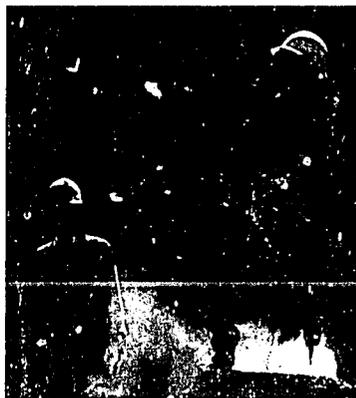
The cattlepost is far from home, near Boatlaname. We go there in the holidays and sometimes stay for a week. It is nice to drink milk and learn to look after the cows, but we always seem to have trouble with the borehole engine.

We also have another home at our fields near Magagarape. That is where my grandmother lives and my mother joins her to help plough, weed and harvest the crops. During school we walk there each weekend, and sometimes stay there in December and January to help with the ploughing. If the crops are good, my sister takes leave in June to help with the threshing.

This year we spent a lot of time building new houses at the lands. My mother says that now we are older, she wants to live all the time at the fields and that we can stay with my uncle during the school term.

I like Molepolole better because many things happen there. We can take the bus to Gaborone on Saturday and see our friends in the town. It is much bigger than Molepolole and very exciting.

My father says when he finishes teaching he wants to live at the cattlepost, but I don't think he will go there because it is so far. He is too interested in his committee work and also he wants to plant trees. I think he will join my mother at the lands.



*E*conomics of a Growing Nation

Only 25 years ago, this was a poor country, listed by the United Nations Organization as one of the poorest in Africa. Today's Botswana is a very different place.

It was the discovery of diamonds that changed the whole picture, making Botswana one of the most progressive of African countries.

Diamonds, copper-nickel, beef, textiles and now tourism are establishing foreign exchange assets which are the envy of many small countries and some not so small. Diamonds are providing revenues to Government to establish facilities such as towns, roads, electricity and water supplies. Beef brings money to the people and tourism is helping to increase rural employment opportunities.

Opinions about the economy vary. Five people see it in five different ways:

Mineral revenues provide funds to build an infrastructure, expand education, improve health, veterinary and other services, build good roads, power stations and new dams. It should be wisely used because once the minerals are sold they are gone. Future generations must benefit from what we spend today.

Towns are developing, but foreign investment has not been as fast as we had hoped. We need more factories and other industries to employ our growing urban population. Many people are still unemployed.

All this money has done little to raise the rural economy. Government has improved rural education and health services out of all recognition, built better communications and put clean water into most villages. Rural development is seen as an absolute priority, but Government has yet to face up to problems of creating employment in rural areas.

The economy still depends too heavily on mining revenues and cattle export. Greater use should be made of assets like wildlife, veld products and tourism in rural areas.

We can do anything, but first we have to be trained to do it. I see the problem as one of training. If industry isn't there, then where do we get our training?

Careful spending, conditions attractive to foreign investors, diversification, particularly in rural areas, and better training are recognized as a basis for a good economy, both by Government in its Sixth Year Development Plan and for the nation as a whole. Government has done much to improve social services everywhere and developed a good infrastructure in towns. The Gross Domestic Product has increased by more than a hundred times since 1970 and new industries in towns are common; however, the real problems of employment in rural areas have yet to be addressed.

Left:

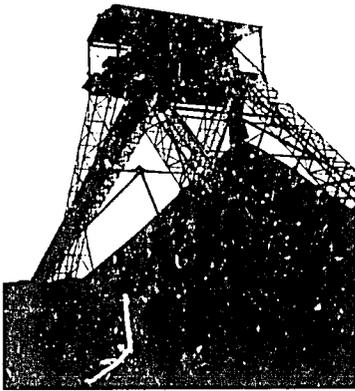
Cattle are the backbone of the nation. They are the bank account for many people, but also provide employment in rural areas, draft power for ploughs, wagons and sledges, and milk, particularly soured milk known as madila, a staple food of Botswana.

About one in two of all families own some cattle. As a nation, cattle are important to us; don't we say:

'Modimo o o nko e metsi,' 'God with the wet nose', thus placing cattle on a pedestal.

Above:

Drilling blasted rock at Kgale Quarries before it enters the crusher. Stone chippings are increasingly needed for road construction, railway ballast and concrete work throughout the country.



Top left:

In the 1870s, all mining equipment, like this heavy three-stamp mill, had to be hauled in wagons through the deep sand, the journey taking more than three months from the railhead to Francistown. Steam engines drove the mill, the open stamps crushing ore to extract gold. (AC)

Above:

Vast quantities of low grade coal lie below the soils of Central District. At Morupule, coal is transferred by belt from mine to power station.

Above right:

Morupule Power Station is linked into a national grid supplying eastern Botswana, Orapa, Jwaneng and Letlhakane Mines as well as the copper-nickel mine in Selebi-Phikwe. Morupule can produce 600 MW of power supplementing Selebi-Phikwe's 750 MW and Gaborone's 250 MW. The brain of Morupule Power Station is the Control Room where complex banks of switches, dials and computers allow minimum staff to control this massive station.

Mining Wealth

If you hear people talking about mining in Botswana, they could be talking about gold, or copper, or nickel, or soda-ash, or even coal, but it is likely that they are talking about diamonds. And the reason is that the country's diamond mines are amongst the world's richest and have helped to bring unexpected wealth, suddenly catapulting national revenue to an extraordinary level and making possible exciting developments in our country.

The story of diamonds is easily told and goes back to the late 1950s when the first prospecting permits were issued. Operating out of Lobatse, De Beers Prospecting Botswana, a part of the huge Anglo American corporation, started to scour the country. They soon found diamonds, but under the wrong conditions and less in number than you can count on the fingers of two hands. The diamonds existed, but where had they come from? The first finds had been on the Motloutse River and its upper reaches were searched centimetre by centimetre, but there was nothing. Gavin Lamond, Senior Geologist heading De Beers' team, knew they were there and continued the search even after it appeared hopeless. And then he realized that the Motloutse's valley was too big for the river and that long ago it must have been a huge river flowing through Makgadikgadi.

Sure enough, geological examination showed that an upthrust of the earth's surface had cut the river by lifting part of its valley and pooling its waters backwards into a huge lake. Now he knew that the diamonds already found could have been carried by the river from somewhere far to the west. The search moved and within months evidence of a magnificent kimberlite pipe rich in diamonds had been found at the little cattlepost of Orapa.

Since then other diamondiferous pipes have been opened at Letlhakane and Jwaneng, swelling production to put Botswana amongst the world's foremost diamond-producing nations. The search continues and evidence of diamonds has been found in many places, but the deep



overburden of Kalahari sands puts mining costs too high for current exploitation.

The diamond story is exciting but diamonds form only a part of the wealth that lies below the sand. Extensive beds of low-grade coal and promising signs of natural gas and oil deposits may one day make Botswana less dependent on outside supplies. Already, coal mined at Morupule helps to fire the nation's power stations at Morupule, Selebi-Phikwe and Gaborone.

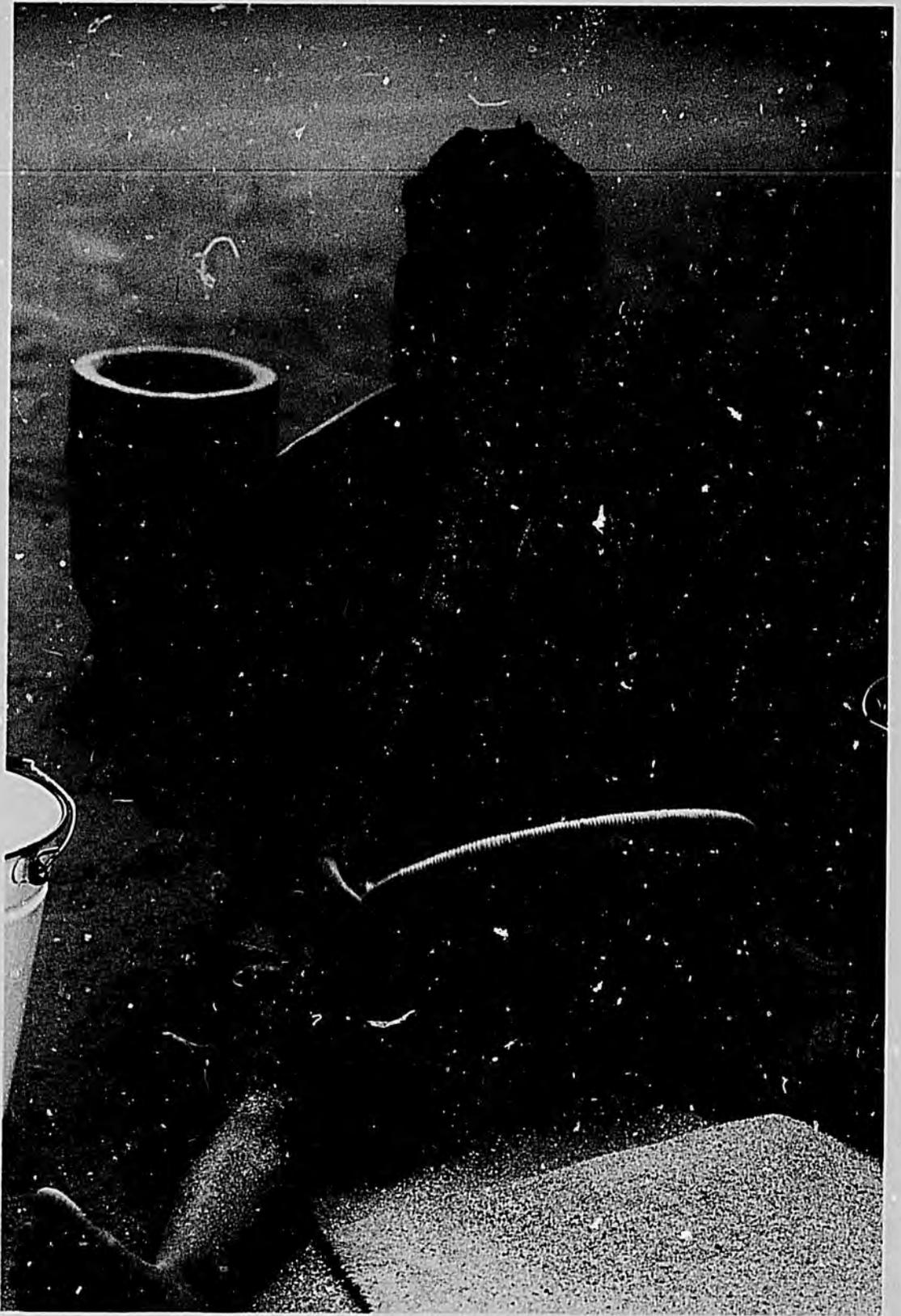
But gold was the first precious metal to be exported from Botswana. Early mining and export started 800 years ago around modern Francistown. Ancestors of the Bakalanga followed the goldreefs down to the level where underground water prevented them digging deeper, crushed the ore, extracted the gold and traded it eastwards through the Zimbabwe State.

And then in 1867 Karl Mauch announced to the world that he had discovered gold near Francistown, precipitating the first goldrush in Southern Africa. Mauch did not realise that much of the minable gold had already been extracted; but the miners rushing from Australia and New Zealand soon found this out and only the hardiest stayed to work what was left of the deposits.

Copper was also mined in ancient times and the remains of those diggings have helped prospectors to locate rich deposits in many areas. In 1974, the P173 million copper-nickel mine at Selebi-Phikwe came into production. Unfortunately, world copper prices have fallen and the mine has had to struggle to stay in production. Today, the picture looks a little brighter with a new mine opening near Francistown. A major benefit of the mine is the high level of employment it offers in a rural area.

Perhaps the most exciting recent development is the opening of the soda-ash mine at Sowa Pan which needs a new 175 kilometre railway branchline and a new township above the eastern shore of the Pan. The deposits in Sowa Pan are enormous, including 400 million tonnes of soda ash, over 1,600 million tonnes of common salt, and large quantities of potash. The mine will become a major supplier to Southern Africa and will help to develop other industries which could include glass and fertilizer.

Diamonds, both gem and industrial from Orapa, Letlhakane and Juwaneng mines, are sorted at Orapa House in Gaborone before despatch to the Central Selling Organization in Europe. Revenues from diamonds can provide Botswana with opportunities to improve natural resource uses. The future of rural Botswana depends on a much expanded economy making optimal and sustainable use of its renewable resources. In 1989, over 15 million carats were mined, worth some P1.5 billion. (De Beers)



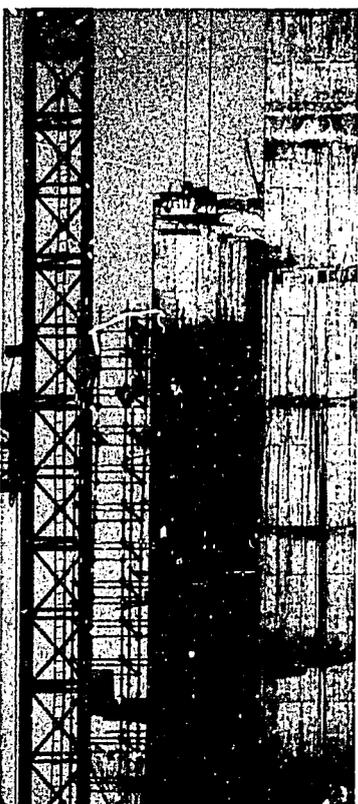


Making use of wildlife products is another way of making money. Zebra skins, tanned and mounted at BGI Tanning in Francistown, put money in the pockets of rural hunters, give employment in the factory, and bring foreign exchange to Botswana.



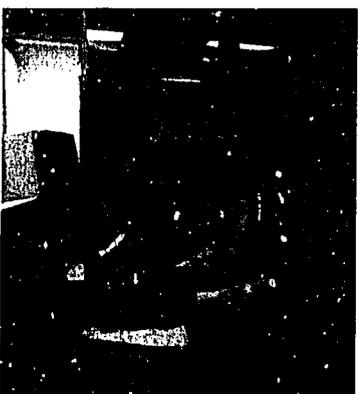
Far left:
Lentswe-la-Odi Weavers is a co-operative with over 60 members, producing tapestries depicting rural scenes, bed-spreads, bags and bedcovers which have been exhibited in Africa, Europe, North America and New Zealand.

Left:
Working at a feedlot in Lobatse, grain is mixed with food byproducts to blend into cattle feed.



Far left:
Nowhere in Africa is the building boom greater than in Botswana. Buildings arise overnight and visitors gaze in surprise. 'I was here only five years ago, but I hardly recognize Gaborone.' And why should he when the capital city is growing by 12 per cent a year.

Top left:
Work is scarce, but the enterprising find ways to make money. This young man sells vegetables in the street, purchased from wholesalers.



Below left:
Computerization helps Barclays Bank of Botswana Ltd. to deal with its ever increasing number of accounts. Four commercial banks cover all larger population centres and have agencies in some rural areas.

Opposite:
Young people are beginning to question rural life with its endless agricultural round, droughts and lack of entertainment. With education behind them, many are looking towards urban centres for a better life.



Chapter Three

RESOURCES AND USES

The People's Views

What are resources? Everything we use and need to live comes from the world around us. These are the things we call 'resources'. They range from the air we breathe to the food we eat. A resource we need is also needed by other forms of life. Rainwater moistens the soil, swells our rivers and fills our dams, and is vital for every form of life. Most resources depend on the existence of others. The loss of only one could affect many others. We must look after all of them carefully, not only for our own sake, but for the whole world in which we live.

Our Natural Resources

- Our land, 581,730 square kilometres of Botswana.
- The landscape with its hills and valleys, rivers and delta, floodplain and swamp, desert and pan, forest and open grassy plains.
- Soil in all its varieties from clay to sand.
- Minerals from agates to zinc, diamonds to brine.
- Climate from sun to rain, wind to cloud.
- The air we breathe.
- Water, fresh or fossil, surface or ground, saline or potable.
- Plants from baobab to lichen, edible or poisonous, weedy or leguminous, aquatic or xerophytic.
- Animals from ants to elephants, bats to swallows, cobras to cows.
- The diversity of life, or 'biological diversity', its variety in genes, species and ecosystems.
- Ourselves, the people of Botswana.
- Our culture from Early Stone Age to today, the things we make, the values we hold, the way we live.



Opposite:

A scene in the Mall, Gaborone. Urban areas are increasing both in spread and in population; the size of the capital is likely to double within 10 years.

Bottom, left:

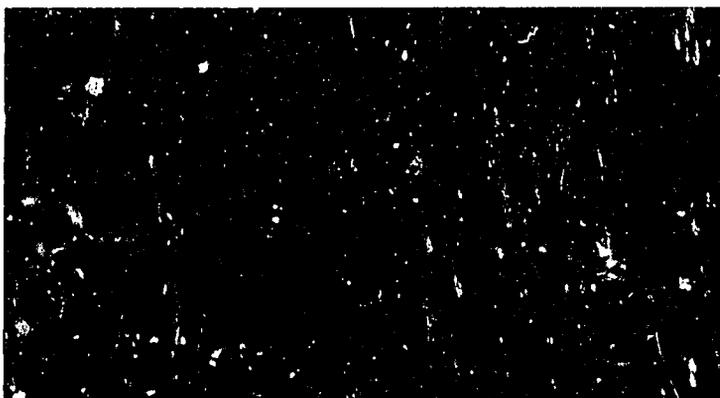
Wildlife (Kudu)

Below:

Water and Food (Lilies)

Bottom:

Grazing and Wood (Plants)





Giraffe once found throughout the country, are now confined to the middle and north. Completely protected in 1967, numbers are increasing, but distribution is not widening.

National Parks, Game Reserves and Wildlife Resources

Total area protected:	17 per cent of Botswana	sq km
National Parks:	Chobe National Park	11,000
	Nxai Pan National Park	2,100
	Gemsbok National Park	26,000
Game Reserves:	Central Kalahari Game Reserve	52,800
	Moremi Wildlife Reserve	3,900
	Mabuashube Game Reserve	3,900
	Makgadikgadi Game Reserve	2,500
	Khutse Game Reserve	1,800
	Manyelanong Game Reserve	3
	Mam Game Reserve	3
	Gaborone Game Reserve	4
Private Reserve:	Mashatu Game Reserve	450
Habitats Protected: (by Park and Reserve Legislation)	All major habitats including river, river banks, swamp, floodplain, island, dead lakebed, forest, mopane woodland, shrub and tree savanna, aquatic grassland, fossil river, dune and rocky outcrop.	
Species of mammals:	164 species including elephant, rhinoceros, buffalo, lion, leopard, cheetah, brown hyaena, wild dog, warthog and wild pig, zebra, many species of antelope, hippopotamus, otter, mongooses, hares, aardvark, ratel, caracal.	
Birds:	About 550 species including eagles, vultures, falcons, owls, kites, flamingo, pelican, ostrich, storks, herons, cranes, geese, ducks, sandgrouse, bee-eaters, swallows, crakes, shrikes.	
Reptiles:	157 species from crocodiles to lizards, from python to skinks, from tortoises to worm lizards.	
Amphibians:	38 species including frogs, tree frogs, a burrowing frog, toads and bullfrogs.	
Fish:	Over 80 species including tigerfish, tilapia, silverfish, catfish, pike, carp and mormyrids.	
Species of plants:	Over 3,000 species and too numerous to enumerate in any detail, but including baobab, ivory and date palm, camelthorn, acacias, mahogany, teak, fig, mopane, leadwood, sausage tree and paperbark tree.	



Springbok once numbered hundreds of thousands in the Kalahari, but human expansion and drought have drastically reduced their numbers. Now Parks and Reserves protect breeding herds allowing for overspill to be hunted in surrounding areas.



Only 100 years ago, eastern Botswana was filled with zebra and impala as well as many other species; but today, although a few herds persist on freehold land, they are gone.

A Land once filled with Wildlife

Less than 150 years ago, eastern Botswana was the home of countless herds and huge varieties of wild animals. Rock paintings, place names and oral history all describe a country of tall trees, large animals and open plains. Diaries of the 19th Century travellers confirm the sources.

Andrew Bain accompanied Kgosi Sebege and the Bangwaketse army when they drove the Bakololo from the Kweneng. Bain witnessed a *letscholo* used to strengthen and feed the army before the battle. His diary entry for 26 August, 1826, written not far from Molepolole, records:

... the slaughter among the quaggas (zebra) and wildebeests became terrible; seventy of those large animals fell pierced with assegais in the course of a few minutes and three fine eland.

On 18 June, 1844, Gordon Cumming camped near Lephepe and in his diary described a nearby pan:

... and its margin was imprinted with the fresh spoor of a variety of wild animals, such as giraffe, rhinoceros, buffalo, sassaby, pallah, zebra, lion, &c.

All described the magnificent trees and permanent springs they saw, the open plains and the endless herds of animals. Within 150 years only a few remnant species remain, mostly on freehold land, and most of the large trees are no more. As human population increases and even greater pressures are brought to bear on the land, so resources will continue to disappear.

Although terrible losses have occurred, we still have trees and animals in eastern Botswana. We have also realized what has happened. Careful land use planning and the will to rectify the situation could see the trees grow tall again and wild animals spread back into areas where they have not been seen for 50 years or more.

Animals Belong to Us All

'Dumela, Mokwena.' 'Greetings, Mr Crocodile.'

Mokwena, the personification of *kwena*, the crocodile, is a sign of great respect and such a greeting is common amongst older people in the Kweneng District. The Bakwena are the people of the crocodile and by implication of the river, since they hold sacred the rivers' animals, eating no fish, nor wearing the skin of any riverine beast. All groups in Botswana respect some animal species. The Bangwato hold sacred the dunker, *phuti*, because it saved the life of an early Kgosi by distracting the enemy's attention from him. Species respected range from *kgabo* the monkey to *tlou*, the elephant, from *ntlole* the spring hare to *tan* the lion. Animals are important to us and one way we express this is through honorific terms.

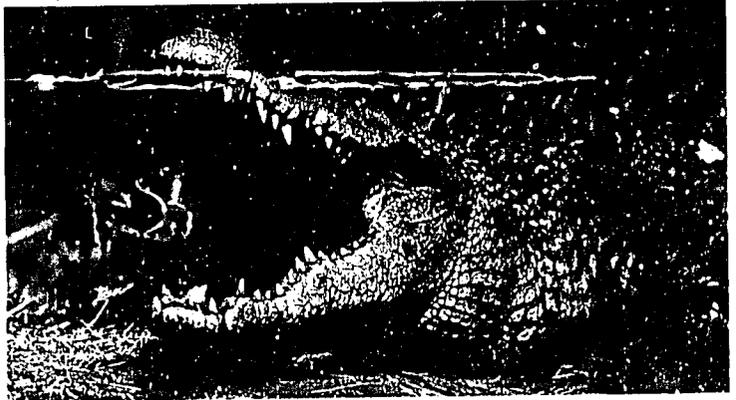


Above:

Thomas Baines visited Lake Ngami in 1861, and with his pantheist, skillfully recorded Kgosi Letshathabe selling ivory to white traders. In a few short years, thousands of elephants had by the bullet until so few remained, the traders looked elsewhere.

Right:

Once, crocodiles were the lords of the river, respected by all. The drying up of permanent pools and rivers has eliminated crocodiles from most of eastern Botswana, yet place names like Dibaneakwena, Crocodile Pools, still record their existence. (A.C.)



The San or Basarwa believe that long, long ago, people, animals and plants were all able to communicate with each other and that to hurt an animal or plant unnecessarily would rebound on oneself. Such a close relationship with nature made them a part of their environment instead of outside and above it, participants rather than manipulators.

Numbers and species of animals have been systematically reduced worldwide. As we people increase and need more land to feed ourselves, and as we pollute air, land and water, so conditions for the survival of wildlife decrease. During the 19th Century, huge elephant populations were destroyed in Southern Africa so that the world's rich, and not so rich, could buy ivory made into jewellery, carved figurines, and ivory-backed hair-brushes.

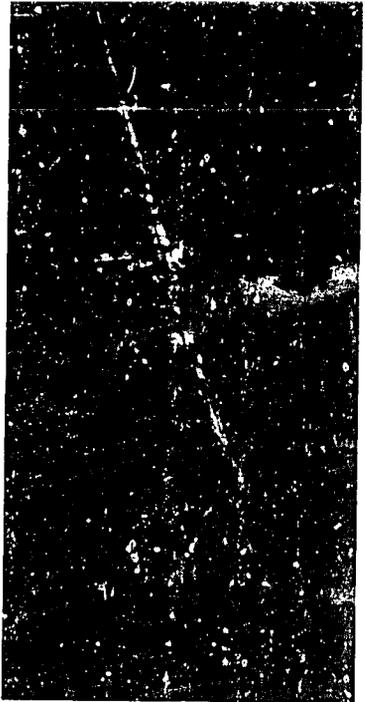
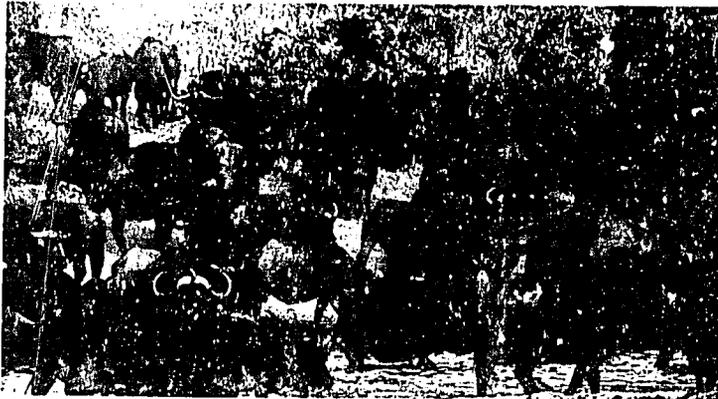
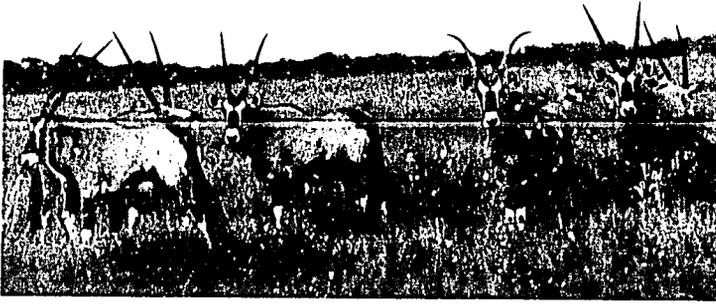
As those elephants were being slaughtered in Africa, an Indian Chief in America tried to tell the United States Government that all life belongs to God who put animals on earth for us to use, but not to destroy. 'How,' he asked, 'can we live without the buffalo which gives us food and blankets, a cover for our tents and shoes for our feet?' Unfortunately, nobody listened and the buffalo are all but gone. In Africa, the same can happen. But we have seen what has occurred in other countries. If we let this happen in Botswana, then we are doubly to blame.

'Mokwena, do you want all the crocodiles destroyed? By destroying them are you not destroying a part of yourself?' And then again, 'Mr Tlou, when the last elephant dies, your name will have no meaning.'

How do we feel about wildlife today? These are opinions of people from around the country.

We have always hunted wild animals, it is a right which we own. If the animals disappear, we will lose a right, and we will also lose a part of our heritage.

Is it really good to protect all this land for wild animals when our population is growing and it is needed to herd their cattle?



Wildebeest carry nasal catarrh and buffalo carry foot-and-mouth disease both of which affect our cattle. They must be kept separated or else they must go.

All lions should be exterminated; they feed off our cattle.

I believe in protecting wildlife because they bring tourists. I sell my baskets to the tourists who come to visit Moremi.

I also believe in protecting wildlife because I work for a safari company. Living here in Shakaue I would never find cash employment if the wildlife industry did not exist.

I need wild animals to feed my family. We own no cattle and no goats. If we could not kill wild animals we would not eat meat at all.

Obviously, opinions differ. For those who own cattle, wildlife is not so important and can be a hindrance; but for those without cattle, wildlife can help them to earn a living.

An ecologist had this to say:

Many areas of Botswana have poor grasses and low rainfall. Water is both difficult to find and expensive to develop. Often these areas are only marginally suitable for raising cattle. On the other hand, they carry many different species of wild animals like gemsbok, eland, springbok and ostrich which do not need water. Such areas could be developed for wildlife which can bring as big a cash return as cattle and with less threat to the land. Often such benefits will reach many poorer people.

Top left:

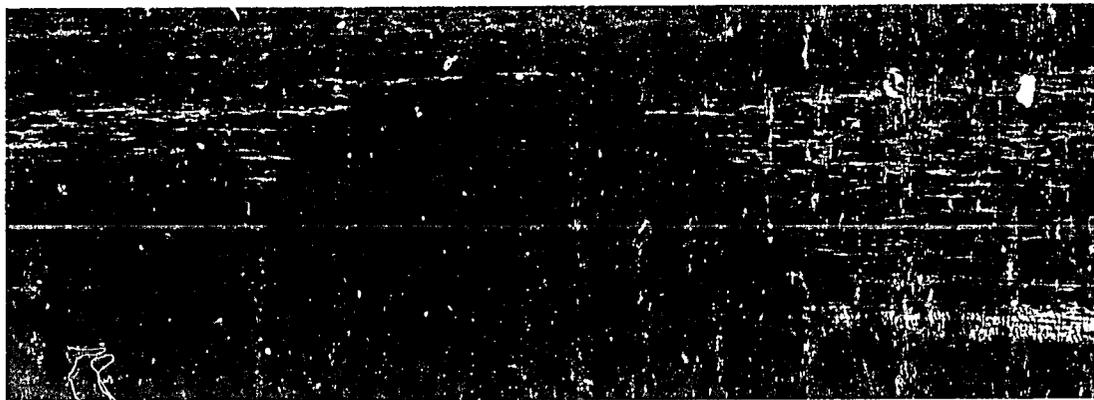
Gemsbok are peculiarly adapted to dry conditions being able to obtain moisture from plants and dew, by digging succulent roots and tubers with their hooves, thereby surviving in the Kalahari without permanent water.

Above left:

The African or Cape buffalo once roamed most areas of Botswana. Today, it is found only in the northwest, particularly in the Okavango and Chobe areas. It is an important species for trophy hunters and as meat for local consumption. Its continued existence depends on availability of extensive forests and water. (AB)

Above:

Buffalo are believed to be carriers of foot-and-mouth disease. To separate cattle and buffalo a fence was erected around much of the Okavango Delta. The fence also helps to protect the buffalo's habitat by excluding cattle from it. (AC)



Hippopotamus graze on floodplains at night. They force open reedbeds as they move around, allowing floods to permeate through the Delta, ensuring widespread flows which prevent drying out.

A Letter to my Teacher

Dear Teacher,

This was the first time for me to travel beyond Francistown and it was very good.

We leave Ramotswa in a big lorry. We had to sit on our blankets because the lorry had no seats in it and it was very dusty.

We arrived at Moremi gate when it was dark. The gate was closed and the Game Scout told us to camp there. He gave us wood and we made a fire. We cooked meat and porridge and ate at the fire. Then we sleep at the fire.

In the night we woke up and heard a terrible noise. We heard trees breaking and the noise came close to us so that we were very frightened. The noise went away, but we sat at the fire waiting for the sun.

In the morning the Game Scout said a big herd of elephants had walked passed but we did not see them; when we drove in the truck we found they broke trees across our road.

We drove into Moremi to see the animals. We saw giraffe, lechwe, hippopotamus, kudu, big birds called *mahududu* (ground hornbills *Mahututu*) and some zebra.

We went to a campsite to sleep. In the night we heard a snorting noise and the Game Scout who was with us said it was a hippopotamus.

On Tuesday, we went to Mboma which is a big island. You drive over a wooden bridge to get there. On Mboma we saw a big herd of buffalo. They stood close to the lorry.

On the last day we went to the Khwai River where we saw waterbuck, impala, wildebeest and a lot of pigs. We did not see the elephant. We camped at the North Gate and on Thursday we left the Reserve to drive home.

On the road the lorry suddenly stopped and our driver suddenly shouted 'lion, lion.' We all looked in the mopane trees and saw two big lions. We thought all the animals stayed inside the Reserve. These lions were outside.

I thank the Wildlife Clubs for taking me to Moremi and I thank the school because we use the school lorry.

This is the first time for me to see wild animals and the Moremi. I did not know how beautiful it is and I congratulate the Batawana for protecting these animals so that we also can see them.

From

A Girl at School.

The Importance of Plants

We are more fortunate than some others, since the surface of Botswana is covered by plants; unlike Namibia, where the Kalahari has less vegetation with large areas of open sand, and near the coast where there is hardly any vegetation at all.

Have you ever been to Bokspits and seen sand dunes bare of grass and trees? Can you imagine what Botswana would look like if the vegetation disappeared? It would look like Bokspits.

The trees, grasses, herbs and other plants play an important part in our lives. They provide all the basic food on which animal life survives and they provide shade for animals and the earth, so helping to keep temperatures down. They hold rainwater in the soil slowing the flow into rivers and so to the ocean, and they stabilize the soil so that it is not blown away. They help to control our climate, and they remove carbon from the atmosphere through their breathing apparatus.

At school, we are taught that there is an inter-dependence between plants and animals, the one cannot survive without the other. There is a balance in nature which regulates the populations of each species of plant and animal, preventing one from dominating the others. Because humans have brains which can think and plan, we have learned to use plants and animals so that we can increase our own population. This started about 10,000 years ago when we became food producers rather than food collectors or 'foragers'. We learned how to keep wild animals which became domestic stock, and how to grow wild plants in gardens and fields.

It is worth remembering what we were taught at school about plants and animals because the whole future of our land, and even our planet, depends on the complex relationship between plants and animals. If the plants disappear, then there is nothing left for the animals to eat; conversely, if the animals disappear the plants will die because animals ensure the distribution of many plant seeds, cross-pollinate plants, keep plants in balance with each other, and help to fertilize the soil in hundreds of ways. Did you know that baobab trees (*morima*) are cross-pollinated by bats (*Bonamathuane*)? If certain species of bats, not even all bats, were to disappear, then baobabs would also disappear.

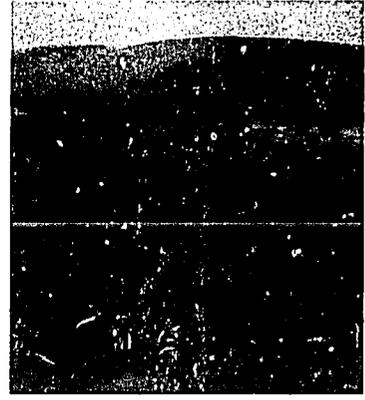
Animals can also help to protect plants against other animals. Certain species of *pseudomyrmecinae* ants, which are foul tasting and emit a nasty odour, live in the thorns of some acacia trees. When animals come to browse these trees, they eat a few mouthfuls and dislike the taste of the ants and so move away to another tree. This prevents the animal from browsing the tree bare of leaves and killing it.

Elephants also control tree growth in many ways. They eat seeds and later pass them out in their dung some distance away. They can press them into the soil with their feet. This spreads the plant and helps it to grow. They open patches of thicket and reedbeds for access by other animals which spread plant growth as well.

Often, there is a close relationship between certain plants, the one needing the other to be able to grow. Often tall plants give shade to smaller plants which could not grow in the sun, and the small plants provide the ground habitat for the tall plants which could not grow under other conditions.

For humans, plants are vital, not just for food but also for many of the things we use every day. Many of our clothes are made from cotton. Paper is made from wood, our furniture is made from wood and throughout rural Botswana wood provides heat for warmth in winter and cooking the year round, light at night, rafters for our houses, posts for our fences and shade to keep us cool in summer.

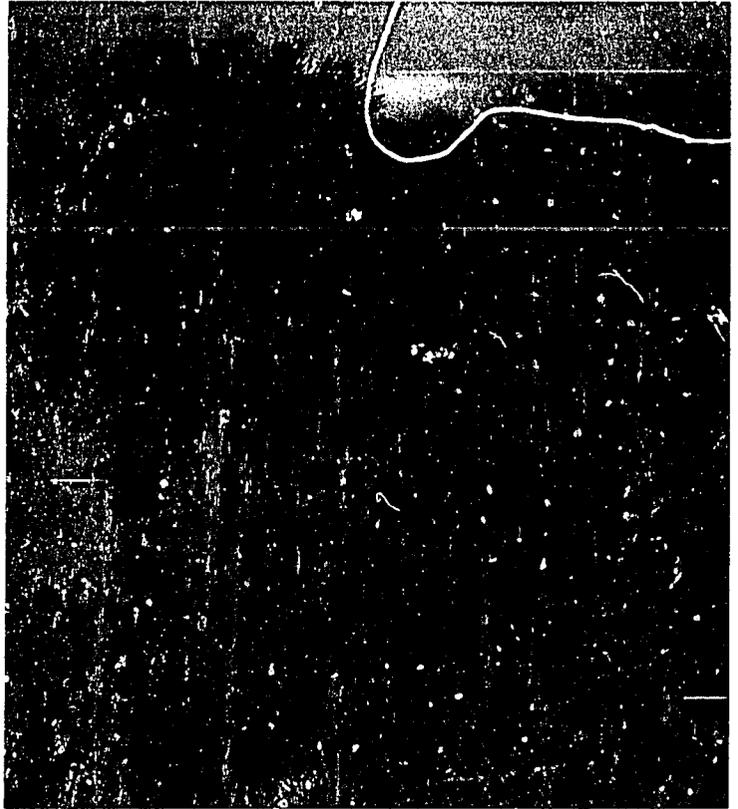
If you ever go to Bokspits where there are few trees and little grass, ask the people how they live; ask them what they use for cooking and heating; how they make their houses and what their animals eat. Ask them to list the different species of plants, birds, mammals and insects which occur at Bokspits. You will find that the variety is much smaller than it is at your home. The reason is that heavy use of this fragile area in the last century severely reduced plant life and thus all other life forms.



Bokspits has lost many of its plants over the last 100 years. (AC)

The Palm tree, Hyphaene petersiana or Mokola, grows in the Okavango and around the Makgadikgadi. Once it was prolific on the Limpopo and Shashe Rivers but now is almost gone.

The fronds are used for basketry, the sap for wine, and the heart of the leaves, gau, tastes like bitter lettuce.



A Plant Economy

Alec Campbell once asked an old man if he could list a few plants which have some economic value. After thinking, he answered,

If a plant has a name, someone, somewhere uses it for something.

Plants are widely used for many things, and could be used for so many more, that it is impossible to list them all here. However, . . .

- About 100 plants are used by rural dwellers for food and moisture.
- Palm fronds, reeds and grasses are used for basketry, mats and thatching.
- Tree saps, barks and roots are used for dyeing, and gum is eaten.
- Fibres are used for rope, string, mats and nets.
- Wood is used for building homes, fences, sledges, canoes, carts, drums, stools and household implements.
- Wood is the major source of fuel for cooking, heating and lighting.
- Some bulbs and succulents are used as poisons.
- Numerous plants are used as medicines.
- Seeds are used to make jewellery.

Mpho Moruakgomo of Thusano Lefatsbeng recognizes the potential for domestication of many of our wild plants. 'Botswana has an extremely diversified flora of edible plants. We must remember that all today's popular fruits, for example, were developed from wild species. It is astounding that the vast potential of our indigenous wild fruit trees has not yet been tapped. Species like *morula*, *mmupudu*, *mmilo*, *morama* and *morethua* all have considerable potential. We are now only just beginning to see how we can better use them.'



Top:
Spears of young *Hyphaene palm* fronds are cut, dried, dyed and woven into baskets by women and young girls wherever palms occur. During droughts, families supplement poor crops with money from basketry; however, palm damage around settlements is spreading, and in some areas of the east, like Bobonong, Manali and Letsame, they have been almost destroyed. (ABI)

Above:
Nationwide, heavy use is made of wood for cooking, heating and light. Some 25 species are regularly gathered and the annual fuelwood harvest is valued at P15 million.

Now sold by the roadside for urban use, prices are escalating.

Around settlements availability of wood is decreasing in widening circles. Botswana recognize the fuelwood crisis as second only to grazing problems.

Top:
Many plants have medicinal uses. Traditional doctors travel far and sometimes hide identities of plants by using special medicinal names.

Grapple plant or sengaparile tubers are dug, sliced and dried. Boiled in water they relieve joint pains and arthritis.

Above:
Information about the grapple plant was given to Europeans in the 16th Century and used extensively by farmers.

Thusano Letat-beng, a non-governmental organization (NGO) specializing in plant research, grows sengaparile at its research station near Kumakwane.

Both domesticated tubers and those collected from the wild are sent to Europe for processing into commercial medicines.

There may well be many species of plants in Botswana with great medicinal value, but science has yet to identify them.

Top:
Desert dwellers obtain food and moisture from wild cucumbers which are often roasted whole in hot ashes.

Cucumber seeds are sometimes dried and pounded into meal to be used as a relish with porridge.

Above:
Cowpea research is conducted at the Agricultural Research Station at Sebele where over 800 different domestic varieties have been isolated.

Wild cowpeas, *dimawa-tsa-naga*, grow in Botswana in areas of low rainfall and could be used to strengthen domestic varieties against drought.

The place of origin of domesticated cowpeas is not certain, but could be Southern Africa and even Botswana. Other varieties of wild plants should be investigated as possible new food sources.

The full value of wild plants used each year by rural people in Botswana has never accurately been determined but, excluding cattle grazing, it could exceed P50 million.

Right:

Water-lilies, known in Setswana as tswii, are eaten, especially during times of drought. The thick stem, or 'rhizome' is roasted in the coals, six providing a meal for one person. The flowers can also be eaten as a relish for porridge.

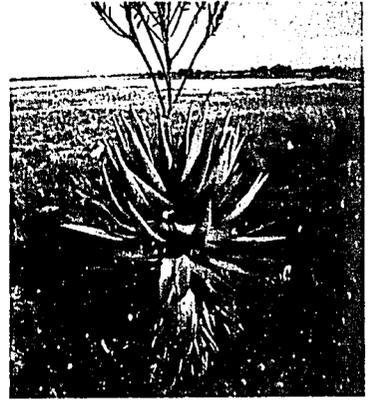


Far right:

Kgengwe, the wild melon of the Kalahari, provides an important moisture source for both people and animals. The raw flesh is pounded in a mortar and the juice drunk. The seeds can be dried and pounded into meal.

Right:

Several varieties of hibiscus are used to make wands and stings. Such wands are used in the construction of fish traps and some fishing baskets.

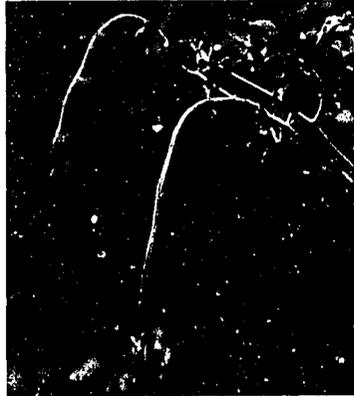


Far right:

The leaves of the aloe are used for many purposes, some for smuff and others as a person. This mokgophla, Aloe rubricolutes, is found in Makgadikgadi Pans and southeastern Botswana.

Right:

For many rural dwellers without a tradition of agriculture, certain species of wild food are preferred because of their abundance and regular yield. Mogoose, one of the Bauhinia family, provides beans and is extensively collected by the Balala of the Southern District.



Far right:

This edible fungus appears to grow only on termite mounds. Boiled or fried, it makes an extremely tasty meal for any palate.

Commercial logging is only conducted in the northern Forest Reserves. The main species are mokusa, rhodesian teak, and morotomade, known commonly as bloodwood or mukwa. Others include mokamba, pod mahogany, tsautdi, rhodesian copalwood, and mothlokomoti. Concessions granted to three commercial companies permit harvesting in Forest Reserves. The size of trees and volume of wood felled is controlled and in 1986 was valued at P2 million. (AC)



Our Domestic Plants

Many of the crops grown today: sorghum, millet, beans, melons, squashes, were first domesticated by our ancestors within Africa. Mealies were introduced from America.

Old people like to talk about past times:

We value our cattle, but we know that much of our food comes from the lands, particularly for those with few or no stock. Crops are very important.

Long ago, we worked in the fields together. Now we plough with oxen, men working the oxen and women guiding the plough. This is our custom.

We know which varieties of sorghum are good, segaolane and marupantse. We select seeds for planting by size and colour because we know some are stronger than others. We know that indigenous varieties can withstand long dry periods while imported species wither and die under such conditions.

We like to mix our crops in the field, some sorghum and a ground layer of beans and melons. That way we usually reap, even in drought.

Farmers know which soils are good for heavy rain and which for poor rain and try to have fields straddling two soil types to hedge their bets during any season.

But crop production appears to be declining as human population grows. One farmer expressed the problem:

Agricultural wages are the lowest in the country. Many workers receive only P30 or less a month. With such erratic rainfall nobody wants to employ people unless they are sure of a harvest.

Another problem is the price of corn. As long as imported grain is cheap, it is hardly worth trying to grow crops under these conditions.

Yet for 70 per cent of all families, rainfed agriculture remains the only way to live. For some women without cattle it appears to be a losing battle. They have no draftpower and no manure for their fields; soils ploughed year after year lose nitrogen and phosphorous. Severe droughts sometimes prevent cultivation, thus allowing fields to rest and be revitalized. But eventually they are often abandoned with little hope for new lands being cleared.

Clearing, weeding, birdscaring, harvesting, ploughing and making brush fences is hard work. The agricultural worker can usually find no other employment near home.

They hire us to hoe, gather and shell beans. It is really hard work and all for a small share in the crop or a few pula; it is better to look for a job which provides real money.

The Ministry of Agriculture researches crops and the best ways to grow them. Slowly, a body of knowledge is being built up. Agriculture will always be difficult in Botswana, but new crops from local species, breeds suitable to dry conditions, and new agricultural methods will help to increase yields in all areas.

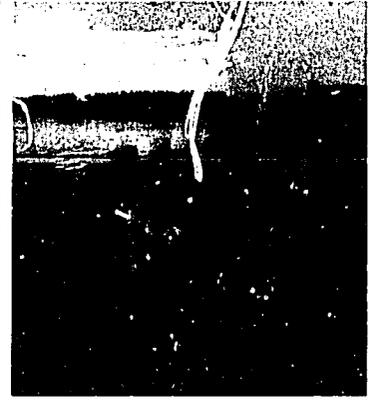


Above, top to bottom:

To plough, one needs cattle and land. For young people, both are becoming more difficult to obtain, particularly good ploughing land.

If the rains have been good, the crops are gathered in the autumn and allowed to dry on racks in the fields before being transported to the home. If the rains fail, there are no crops to dry. (P11)

Cash crops are becoming more popular but need labour which is scarce as agricultural wages are low. Sunflowers do well even under poor rainy conditions.



Above:

The mokoro or dugout canoe is made from seven species of large tree which grow along the channels of the Okavango. A recent study has shown that trees cut for mokoro do not endanger the riverside woodland.

Left:

Traditionally, women and children fished with baskets, some smacking the water and driving fish into baskets. (AB)

Fishing in the Okavango

Giquma Lagoon, Okavango Delta. 7.00 am, 11 October, 1989.

Q What type of fish are you hoping to catch?

A With the hook, I am only trying to catch tilapia, although, if I go over there and use meat on the hook, I can get barbel as well.

Q Is this your own *mokoro*?

A No, it belongs to my father. I fish for him. He is the one who has the government grant to buy equipment.

Q Do all the family fish?

A Only my grandmother does not fish. After school, we boys fish most afternoons and sometimes all day on Saturday.

Q What do you do with your catch?

A I sell it. All the large fish are opened, gutted and salted. If the lorry comes, they are taken for the feeding scheme. Sometimes the lorry is very late.

Q Who catches the small fish?

A My mother and sisters, although we sometimes help. They catch them in shallow backwaters. They build a mud wall and use big baskets. Sometimes they catch big fish also.

Q Do you like fishing?

A Yes, I fish often. I like taking the *mokoro* along the edge of the reeds and lifting the gill nets. Sometimes we catch some big fish, although we have trouble with otter eating the fish in the net. Hippo can also drag and tear the net.

Q Do tourists interfere with your fishing?

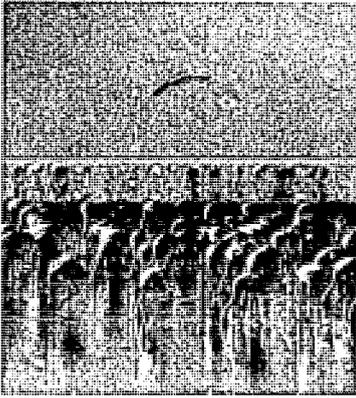
A Sometimes, but not often. They use powerboats from the lodge and want to catch large bream and tigerfish. They fish in the main channels while we can also fish in the backwaters.

Q What is the lodge?

A It is for safari. Visitors come from abroad to fish and look at wildlife in the Delta.

Q What do you think of the lodge?

A I think it helps us. My father works there. He takes the tourists to see birds by poling them through the reedbeds in a canoe. He also helps with the fish farm. They have built ponds and are breeding fish.



Birds of Botswana

(For answers, reverse the page)

1. How many species of birds live in Botswana?
2. The largest bird on earth lives in Botswana. Which bird is this?
3. The heaviest flying bird lives in Botswana. Which bird is this?
4. Can birds be hunted in Botswana?
5. Are any birds in Botswana internationally recognized as endangered species?
6. Which birds are used by doctors to bring rain?
7. Which bird builds the largest single nest?
8. Is a bushbaby (galago) a bird?
9. Which bird can be taught to talk?
10. *Bana bakorwe ba kgadagana tlhogo yatsie*. What does this proverb mean?

1. There are about 550 species of birds in Botswana.
2. The ostrich.
3. Kgori, the kori bustard.
4. Yes, most species are protected by law. A few can be hunted with a licence.
5. Yes, the Cape vulture, wartled crane and slaty egret amongst others.
6. Flamingo and fish eagle.
7. The hamerkop or *numastanska* builds an enormous nest for a small bird.
8. The bushbaby, *mogwale* is a mammal, not a bird.
9. The crow, *legakabe*.
10. Hornbill's children share even the locust's head (A family shares its least possessions).



Top, left to right:

In years when it floods, flamingo stand in their thousands on Sowa Pan. As waters recede, they migrate, and as the pan fills, they return to breed far out across the brine.

Carmine bee-eaters live in colonies in the ground, digging two-metre tunnels to protect their eggs.

Ostrich is common throughout Botswana. Living to 60 or more years and producing up to 24 or 30 eggs, it is an important bird. Efforts to farm them are being made in several parts of the country.

Above:

The jacana or lily-trotter has widespreading feet to help it walk across aquatic vegetation. It builds a fragile nest amidst lilies and rears its young on water, although it cannot swim.



Chapter Four
SOME
THOUGHTS ON
RESOURCES

People's Attitudes

In the last chapter we have seen that Botswana has a rich variety of resources. We tend to take our resources for granted. Depending on where we live and what we do, we have different attitudes towards them. The young often see them in a different way to the old; rural people must rely on resources around them while townspeople lead a different sort of life. A villager relies on the resources he knows for his family's subsistence, but a planner can stand back and see resources in a different perspective, and recognize new opportunities for more varied uses.

Resources and the Young

People in rural areas are becoming worried. They see no jobs, while resources are slowly disappearing. Many young people want to move to town where there are jobs outside the agricultural sector. A young man from the Southern District summed up the situation:

We live very far from Kanye and even further from Gaborone. When it rains, it is not too bad because people are busy growing crops and there is some milk from the cattle. But in the drought it is bad, with no crops, no milk and cattle dying.

We get water from far away, although the Council is drilling a borehole near us now. Even school is far and we come home too tired to help collect water.

Our father worked on the mines, but now he stays at home. He used to send money, but we grew up hardly knowing him. Mostly, he visits friends where there are beer drinks.

My brother went to secondary school in Kanye, but I had to stay at home because there was no money for uniform and transport.

For us the questions are:

Do we stay at home or go away to look for work?

What can we do if we stay at home? Life is boring with nothing to do but herd cattle and sometimes work in the lands when it rains.

With only a Standard 7 education, what job can I get and who will help me to find it? Where can I stay in town even if I find a job?



Industry is not easy to establish in rural areas. This small factory at Pilane processes both wild and domestic hides into leathersgoods, using local resources and providing employment.

Opposite:

The waters of the Okavango could produce a much greater yield than they do today. But fishing is a hard industry to develop because the Okavango is remote and many areas of the Delta are difficult to reach because of thick reedbeds and variable flooding. The potential harvest could be worth P10 million a year but current takings are worth less than one million pula.



The young are particularly aware of what to them often appear as almost insurmountable problems affecting their lives and futures. They are a large majority since people between the ages of 13 and 26 form more than a quarter of the population. This group is a major voice today, but more importantly they are tomorrow's guardians of the environment. Their concerns focus more on the needs for development and creation of job opportunities than they do on conservation of the land. A young school teacher put the situation in other terms:

I teach in a rural school and was transferred here last year. I enjoy teaching and want to make it my career, but I worry about my future.

This place is remote and the people here so poor. Unlike most villages, there is no borehole and they draw water straight from the pan; even the school's water is brought by tractor from the next village. The Council drilled three holes, but all were blank.

There is no entertainment and no bus service. We teachers must stay here for three long months at a time. I was married last year, but I never see my husband because of this transport problem.

I don't know how people live here. Few seem to own cattle and some have no lands. It is really the women I think about; most men go away to work. Women cut grass, get firewood, brew beer and look for wild food in the drought; even the children must help them. Good rains mean that farmers from other villages try and entice the children from school to work in the lands. Parents don't seem to mind because it means a little money or a bag of beans.

Can I go on teaching and what will happen here as the village is growing all the time? How will people live? I worry about my future and the future of the children I teach.

Between the young school teacher and the ex-pupil, some of the country's most pressing problems have been expressed.

- Rural development problems, particularly water and transportation.
- Lack of special training for those who leave school at a young age and difficulties in qualifying for jobs.
- Long-term separation of family members, and problems of living in rural areas.
- Lack of rural employment and difficulty in finding work elsewhere.
- Increasing pressures on the land.
- Lack of rural entertainment and inevitable drift towards larger centres.

Above:

Self-taught, he makes toys for sale from discarded punk in the village. His skill is recognized and his work is displayed in Phuthadikobo Museum.

Top:

The majority of school teachers are women, outnumbering men in some schools by four to one.

Top right:

Mechanical skills are urgently needed in rural areas where it can take weeks to have a tractor or borehole engine repaired.



Opinions of Adults

People over the age of 20 years, who include about a further 25 per cent of the entire population, hold rather different views to the young about resources and their uses. Most of them live in rural areas and have seen the changes in the face of Botswana over the last two decades and droughts. In fact, it is older people and the very young who live in remoter rural areas; most youths try to move away from them to live in urban areas.

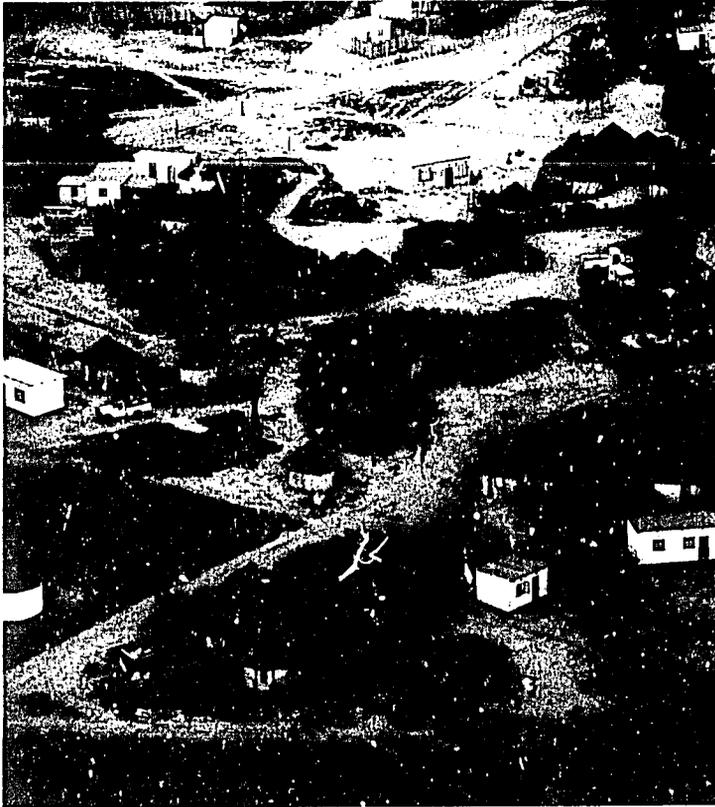
Travel wherever you will in rural areas, you always hear some people blaming the drought for misfortune. More recently however, a new awareness is being expressed:

It wasn't too difficult to live here in the past. We always had a few cattle and the goats, and most years we could grow something, even if it was only beans and melons. When it was bad, we hunted and ate mogose [a wild bean]. The trouble is the farms have spread; there are fences everywhere and nothing left to hunt.

A small farmer had this to add:

I depend on the village borehole to water my 15 cows, the goats and two donkeys. Ten years ago, only a few of us kept cattle here, but now there are too many. The grass is finished round the village and it is hard to find grazing, even when there is no drought. The cattle are our life; we could not live without them, but there is nowhere to move.

Adults tend to recognize the problems of grazing, firewood, and lack of water. The foreman at a large cattlepost expressed his worries about lack of grazing, particularly during drought, and believed recovery during rains was not complete.



Looking down on Kanye, one can see new buildings with tin roofs replacing traditional thatch. Costs of thatch escalate as grass becomes more difficult to obtain.

Right, top:

With expanding urban populations, roadside sales of firewood are increasing. Mophane, a favourite fuelwood, is being cut down in some rural areas to supply towns.

Right, bottom:

Wagons, donkey-carts, sledges and trucks have revolutionized firewood collection spreading deforestation far from villages.

Women often see problems from a different angle. Two housewives are worried about resources vital for the heat and shelter of their families:

You used to be able to cut thatching grass just outside the village [Mogoditshane], but you can't do that today. There is no grass left near the villages. We have to buy it now from Lentsweletau or Mmamabula at between 600 and P1 a bundle. It can cost more than P800 to thatch a house. We cannot afford that.

An urban dweller from Francistown said:

Firewood is becoming a real problem. It has never been easy to get, but now it costs more and more. People say they must bring it from so far away. What will happen when the trees are gone?

Today, problems are discussed back and forth, in the home, at Village Development Committee meetings, in Council, in the *dikgotla* and in Ministries. Both Government and Non-Governmental Organizations hold workshops and seminars and a body of opinion is steadily emerging. We recognize that we could use some of our resources more widely, that there are other uses for some of them and there are those we have entirely neglected.

To discuss problems is to recognize their existence and is a first step towards looking for answers. Much has already been done in rural areas, but job creation remains the most important factor.

Opposite, top:

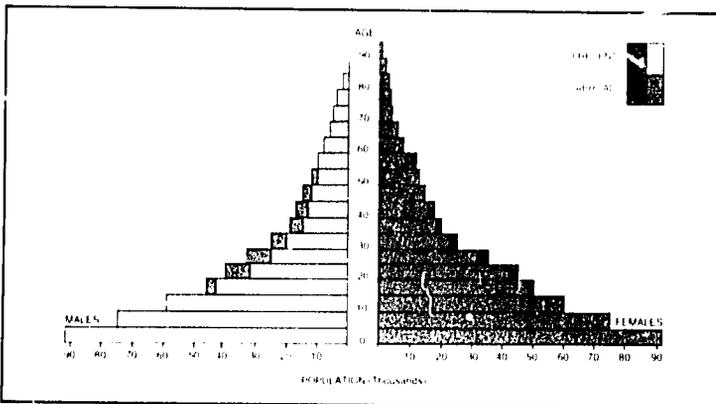
People attending a meeting in the kgotla at Molepolole (AG)



A Growing Population

Early census figures were probably inaccurate with serious undercounting taking place. Even so, in only 100 years the population has multiplied by at least 10 times. If it continues at the present rate of about 3.5 per cent a year, by the year 2030, when many of us will still be alive, there will be over five million Botswana. Can the land support such numbers? Most people will live in towns. How will they be fed, housed and employed?

The future of all resources is linked to population and standards of living. Without alternative employment in rural areas, living standards of agriculturally-based populations will deteriorate. More and more land will be needed to support them, land already in short supply, and use of natural resources to supplement agricultural incomes will increase beyond supply.



People are on the increase. Census statistics show:

1904	120,776
1911	124,350
1921	152,983
1936	265,756
1946	206,310
1956	300,175 (?)
1964	549,510
1971	596,994
1981	941,027
1991	1,356,941 (Est)
2001	1,894,193 (Est)

The age pyramid shows how the population is made up mainly by young people.



The urban population is growing at 12 per cent a year; who will provide housing, services and food for a million city dwellers in the year 2010?

Many public officers are expressing their views. Mr Seeiso Liphuko, former Director of Town and Regional Planning and now Deputy Permanent Secretary, Urban/Housing in the Ministry of Local Government and Lands, had this to say on urban growth:

The major problem with our big towns is that they are growing too fast. The result of this fast rate of growth is that greater and greater demands are made on scarce and, in some cases, finite resources. Water is nationally in short supply. In planning settlements the availability of water is a key factor. Huge quantities of water will need to be transferred over long distances if Gaborone and other settlements grow much larger. In addition, housing, power, sewerage, drainage and rubbish disposal all have to be provided, let alone food for urban dwellers. Such development requires very careful planning over a long time and is very costly.

But with a population doubling itself in 20 years, and Gaborone likely to have over one million inhabitants by 2010, we must act immediately. Our population is growing far too fast and however much it goes against tradition, and however unpopular it is, we are going to have to find appropriate and generally accepted methods to restrain this high rate of population growth. If we don't, we are not going to be able to provide for ever-expanding urban areas, and living standards will fall to a low level.

Looking at his district and shortages of agricultural land, a councillor remarked:

People don't seem to care about the environment, they just destroy it. I think there are two big problems: there is no alternative way of life for most people; they must eat and have shelter. And there is no incentive to look after resources since they know that if they don't use them, someone else will.



For most rural people opportunities are few, yet they see others doing well. A senior administrator commented:

It is natural for everyone to want to have the good things in life, a nice home, car, television and money in the bank, cash or cows. But the ways to achieve this are limited. It is getting on the bottom rung of the ladder which counts; once there, climbing is not so difficult. But most people can't get a foot on the rung, there simply isn't room. There just aren't the jobs in rural areas. They have to make use of whatever resources there are close to their homes. More and more people have to share these resources which means less and less for those who have no other way to make money. That is why we have this big gap between rich and poor, a gap which is growing as population increases and assets diminish.

One of those poor people is being asked to decide now on his future, at a time when he has nothing:

I am really scared to move, although if I did I would be nearer to school, water and the clinic. But this place is my home. I was born here and know how to use its environment to support my family. If we move, we will have services, but will we have jobs? It would not be our home and we would not know how to find food.

These problems are not new. Speaking at a conference in 1982, Professor Isaac Schapera said:

I first started work in Mochudi in 1929, more than 50 years ago. One thing strikes me forcibly – during the drought of the 1930s we discussed the same problems you discuss today, shortage of land, land tenure, labour migration.

Two problems tend to stand out, the need for people in rural areas to take initiatives and the terrible lack of opportunities.

The Chairman of a Village Development Committee said:

The trouble is there are so many poor people here. Those with initiative and skills leave to earn money elsewhere. How do we develop this village without them?

There are no alternatives for most rural people and His Excellency the President has clearly recognized their position:

The only real asset that many people own is their right to grow crops and raise cattle on the land.

Left:

Intensive grazing is devastating areas around some villages and boreholes. Vegetation is lost, and in some areas the landscape is beginning to look like a true desert, a process commonly known as 'desertification'. 'Don't blame the drought; we have always had drought; desertification is a new problem. Cattle numbers must be controlled otherwise desertification will spread.'

Above:

I have lived here all my life, and my fathers before me. Where can I go to earn money for my family? Education and health are not enough; we need a way to make a living now that much of our land is fenced.



The eastern highveld has supported cattle herds for about 1,500 years. Heavy grazing has denuded large areas of sweet perennial grasses, whose demise gives place to scrub encroachment, annual grasses and herbs of low nutritional value. Some areas turn into bare ground and soil erosion carries away the soil.

*R*aising Stock on Tribal Land

More than 80 per cent of the national herd is raised on tribal land. For those with larger herds there have been options in the past: to join a syndicate, to drill a borehole, to apply for a leasehold ranch. For those with few cattle, and they form the vast majority, options have been fewer.

The poor must raise their cattle and goats on common land, often close to a large village. When drought strikes, they are the first to suffer. Experience has shown that herds of less than 40 head of cattle can be totally destroyed. Looking at his thin cattle in the drought, one villager said:

Without a borehole of my own, I have to share grazing with all the poor people in the village. Once, this was a small village and there was grazing for all, but now it is large and there is not sufficient land for all of us to keep cattle. I have no other way to feed my family.

Another man with few cattle tried to explain the position of small herd owners during the drought:

Of course, I know the drought must come. The more cattle I have when it comes, the more chance I have that some of them will survive. I only sell an animal when I need to raise some money. We never know how long the drought will last, or how bad it will be.

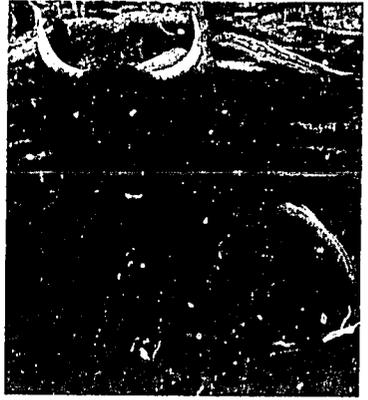
Mostly, we try to keep our cattle during a drought knowing that if we sell them when thin, we get little for them and sometimes they are condemned. If I sold them, I would have no way to plough or to start again when the drought is finished.

Even having a private borehole or a Tribal Grazing Land Policy (TGLP) ranch also has its problems. A fairly wealthy cattle-owner outlined these:

If I am honest, I must say I have too many cattle on the ranch, especially during the drought when grass is poor. But I have problems. I had to drill three boreholes before striking water. I got a rebate, but it still cost much more than I expected. If I kept less cattle, I would be unable to cover repayments to the bank. Then, my relatives have cattle. As the eldest, I have to help them with grazing and water. Even the people I employ have a few cattle and I find it impossible to refuse to keep these here.

While drought can harm the individual rancher, it has also had the good effect of weeding out weaker animals, thus improving the standard of the national herd.

Goats are valuable animals; particularly to poorer sections of the population. They can be bought and sold more easily than cattle whose price is often beyond the poor person's pocket, they provide much of the protein eaten and some of the milk drunk in rural areas. They can be kept under difficult conditions, and be used for range improvement, since they will eat



encroaching bush.

Cattle have always played an important role in the lives of Botswana. Ownership of cattle is seen as the way to live. In the past, lack of cattle signified a nobody.

Cattle are a bank account offering dignity and prestige, and through *mafisa* loans, a means to forge economic and political relationships. Cattle were once the means for paying fines and remain the source of meat eaten communally at all important events. Once owned, cattle are not easily sold. A man would rather invest in cattle than in the bank.

**There are over two million head of cattle on tribal land,
two head for every man, woman and child**

Although all would like to own cattle, about 45 per cent of families have no cattle, while five per cent own about half the national herd. Even so, many cattleless people gain access to cattle through *mafisa* making the livestock industry very important in rural life.

Declining range in the east has prompted a shift towards the more fragile ranges of the Kalahari sandveld. To alleviate the situation around villages and in communal areas, rights to drill boreholes far from villages have been allocated, and about 400 leasehold ranches gazetted. Larger cattle-owners were expected to take up leases and move their herds from communal lands, affording more space for the smaller owner.

A land development officer described the situation:

What appeared to be a workable proposition has not always succeeded. Empty land demarcated for ranches turned out to have occupants who hunted, gathered food and sometimes owned a few stock, usually goats. Ranches and groundwater did not always match up and developments have proved very expensive.

Ownership of cattle involves a whole complex of social obligations. We thought it would be easy for the new leaseholders to remove all their stock from communal areas, but this hasn't happened. People cannot just give up their rights on communal land because all their relatives and mafisa partners are also involved. These ranches are increasing the national herd, but they are not relieving pressures on communal areas.

Problems of communally used land are recognized by cattle-owners, both rich and poor, and by Government. Attempts to relieve the problem, like the introduction of leasehold farms, is a step towards reducing congestion and overgrazing. Landuse planning, undertaken in every district, will help to define the number of cattle a range can support, often known as its 'carrying capacity', and will eventually ensure better grazing practices.

The goat and sheep population is increasing with some 1.5 million goats on the hardveld of eastern Botswana. Goats will eat both grass and shrubs and can exist on degraded range, even during drought. As one poor man expressed it, 'goats are our cattle. They are cheaper and survive better than cows during a drought.'

Left:

Don't we say 'Ga le ke le feta kgomo le tlhaba motho.' We cannot part with our cattle.

Above:

Milk of the cow, soured in a bag, is a man's food; better than grain, better than beer, it is only surpassed by the meat of the beast.

*L*ooking After the Rangelands

What other strategies are available to us to increase livestock numbers while conserving grazing lands? The following statements need consideration:

However nasty it appears, forms of stocking control need to be introduced. The Natural Resources Act needs to be implemented. First, it is important to determine for every area what its carrying capacity should be and set it for poor rather than average or good conditions, so that the range has a better chance of recovery during good rains. Secondly, monitoring is needed to ensure range does not deteriorate and suitable stocking rates are maintained. Farmers will complain, but their grandchildren will thank them for passing on good range.

Land Boards need to be stronger and have greater technical skills to control adequately farmers' activities. The Ministry of Agriculture recognizes their authority under the Agricultural Resources Act but the Boards require strengthening and they need to include people with good technical training.

It might help if communities were given more power to manage their own areas. In other words, give them exclusive rights, but hold them responsible. They would ensure members looked after the communities' resources and would control foreigners. Where range is very poor or too heavily stocked, compensation could be offered to people who agree to remove stock from the area.

We on tribal land have little opportunity to invest except in cattle. Normally, we cannot invest in property. If we sell cattle, we can only buy more cattle. We need opportunities to invest in property developments, in stocks and in fixed interest securities. The Government needs to create or widen such investment fields, then we could consider keeping less animals on the range.

The National Development Bank is trying to link livestock and water development. Proper controls on water development would help the livestock industry. Actually, you could go further by charging for water on a sliding scale. Perhaps the first 10 head would be free, after which an annual fee per animal rising with numbers to a maximum of perhaps P30 a year could be charged. This is another constraint people would not like, but it would help the smallholder and act to control overuse by larger herds. It might even entice richer farmers to move their cattle off communal land. In any event, it would mean that more money would become available to communities to help them restore their pastures.

Efforts should be made to change traditional attitudes towards livestock ownership. People must look on cattle more as commercial rather than as prestigious and political assets. This would mean improving breeds so that individual animals carry more meat, mature quickly and can withstand drought, and also require a regular offtake to the BMC each year of at least 10 per cent of the herd.

Perhaps this would not increase the size of the national herd, but it would certainly increase its value both to the farmer and to the country, and would help to conserve pasture.



Water

Water is a scarce resource, with large supplies often occurring far from places where they are most needed. It is important to co-ordinate future urban and industrial developments with this scarce resource.

The most heavily populated area is the southeast with over one-third of the nation and most urban settlements – Gaborone, Molepolole, Kanye, Mochudi, Ramotswa, Lobatse and Jwaneng. With industry and population growth increasing rapidly, existing water supplies will be insufficient in this area by 1995. A National Water Master Plan has recently been prepared. This will help to integrate existing and future supplies and demands for this most basic resource. Its vital task is to ensure that future demand in any area does not exceed sustainable supply. If it does, this could eventually result in developments becoming uneconomic.

Above:

'Government's policy is that infrastructure must eventually pay for itself; the consumer pays. As an urban dweller will I be able to afford water?' (AC)

Left:

'What will happen to the Okavango Delta if a lot of water is extracted to supply other areas of Botswana?'



Pasture

My father inherited his right to keep cattle here in the South-East District. Unfortunately, there are so many cattle that there is no room now for new herds. Most of the grazing is gone and you can see bare earth and rock. Even the earth is being washed or blown away. Really, we should reduce our cattle to give the grass a chance. My father says that only a few of us would reduce our herds, most people would refuse and would gain at our expense.

Fair and proper use of communal land will require new opportunities for a livelihood and new attitudes towards sharing a common resource. Pictures taken of Botswana from satellites show that range degradation occurs throughout the country – not just in heavily populated areas like the South-East District. It is worst in areas where livestock are kept.

Above and left:

During the 1960s drought, stock died mainly through lack of water; but in the 1980s, 80 per cent of farmers blamed lack of grass rather than water as the root cause of the problems.

Careful use of the range and control of cattle numbers will preserve good grasslands. Although their carrying capacity declines during droughts, when good rains come, they will return to their former state.

Compare the overgrazed land in the picture above (The South-East District) with less intensively used pasture south of Lake Ngami on the left.

Right:

'I use wood to carve, morula, motlopi, morukuru and moplane. I sell my handicraft, both in the street and to Botswana – craft Marketing Company for export. Some species like morukuru are disappearing. It is a good hard wood and doesn't crack easily. It is not used for cooking since its smoke is poisonous.'



Far right:

For many people brushwood is the only material they can use for fencing. Fences like this need constant repairs.

Below:

Digging up roots, bulbs and tubers for both food and for medicines is a common practice in rural areas. Such products help supplement rural incomes and can be vital for human welfare.

Below right:

If a market is established for any veld product, grapple, baskets, ornamental plants, eventually controls must be introduced, otherwise the parent stocks are damaged. (A.C.)

Wood

Around large settlements, wood is disappearing at an alarming rate. People complain that they must walk farther and spend extra time looking for firewood as little or none remains near home. People in towns are unhappy about the rising cost of firewood which is brought from rural areas.

Many people, particularly the poor, fence their fields with brush. Surveys indicate that 45 per cent of wood used is for energy and 45 per cent is for fencing. For most people, coal is too expensive or not available and wood remains their only fuel. Poles and wire for fencing are also expensive, although Government helps farmers through assistance programmes.

The Botswana Technology Centre and others are looking at small but efficient stoves which will use much less wood.

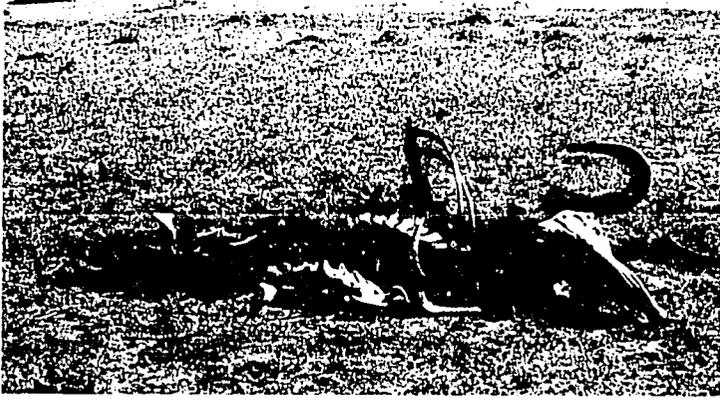


Veld Products

Wild foods, medicinal plants, different woods and grasses, tree saps and gums, reeds and palm fronds, bees and other insects, are all veld products.

Poor people need them to live, but stocks are decreasing. 'To find good palm and trees which give dyes we now have to walk many kilometres,' said a basket-maker from Gomare. 'Almost all the right trees near the village have been destroyed.'

'We used to find a lot of food in the bush, nuts, berries, vines, cucumbers, all kinds of things. Since cattle came it has become more difficult as when they are hungry they eat some of the foods we used to eat.'



Wildlife

Sediri Modise, Assistant Director National Parks, Department of Wildlife and National Parks, points out the plight of Kalahari species, particularly the wildebeest:

Generally, wildebeest obtain moisture from the plants on which they feed and by grazing before dawn when the grass is also wet with dew. However, during drought years, when this level of dietary moisture falls below the animals' minimum requirements, they are forced to search for permanent water sources. When moving north in search of water, they encounter the Ghanzi Farm and Khukhe cordon fences which channel them on to the Boteti and Lake Nau areas. Here, all the land within 40 kilometres of open water has been heavily overgrazed by cattle. If the wildebeest stay near water to drink there is no food and they die; but if they stay in areas where there is grass, they die of thirst.



Above:

Much of Botswana is criss-crossed by cordon fences which have tended to channel wildlife movements into overgrazed areas near open surface water.

During the 1980s drought, more than 300,000 wildebeest, 250,000 hartebeest and 60,000 zebra perished. Most died because there was no grass in areas where surface water occurred.

Left:

Can these populations recover, or is there no space left? What did Botswana lose in cash terms? At P2 per kg of meat and P1.00 per zebra skin, we lost P250 million, sufficient money to feed Botswana for one year.

Foresight of the drought and well-prepared culling programmes could prevent much loss leaving more grazing for the remaining wildlife. (AC)

Left:

Government recognizes pollution problems. One step taken is to employ people to keep the roadsides clean.

'I never stop. I cut grass and pick up cans. Even as I bend to pick up the rubbish, people throw more by the roadside. They don't care if their country is dirty.'

Far left:

In 1985, sample counts of litter along the Gaborone to Lobatse road suggested that more than 250,000 cans lay along its borders, one for every four Batswana and one for every person living in the southeast.

Pollution

Pollution is believed to be limited to a few areas, but is spreading. Recently, a dam site on the Motloutse River had to be abandoned because it was found that mining had polluted the river. The dam will now be built above the pollution point, but the best site has been lost.

A number of boreholes in urban areas have been closed because water had been contaminated. The problem is lack of sewerage systems. Answers to these problems are not simple and will cost money.

Trash disposal in most settlements is a real problem. Municipal and council dumps are not well organized. Also, some people are irresponsible, dropping cans or dumping loads of trash along the road and in the bush.

Pollution laws are being strengthened to ensure future developments bring less risk of pollution.



Chapter Five

PICKING UP THE CHALLENGES

The Way Forward

Sustainable Development involves using annual yields of resources for an ever-increasing number and variety of purposes while avoiding damage to parent stocks.

To achieve this, scientific research is needed to provide basic information on resources, their nature, distribution, abundance, life support needs, and potential economic values. As information is gained through research, so technologies must be studied to determine new and more economic methods for processing and using the products of resources.

A good example of this chain of events is that of *matlhowa*, the cocoons of the indigenous moth, *Gonometa rufobrunnea*, which occurs throughout the country but predominantly in mopane country and, in some dry years, in enormous quantities.

Traditionally, the cocoons were strung together in a belt which was wrapped around the legs or body and used as a rattle in dancing. The cocoon had little value until the belts became an item of tourist interest when a few entered the handicraft industry.

The discovery at Kumakwane in 1984 that the cocoons contain a valuable form of wild silk has completely changed their economic value. The following steps have been taken:

1. Research has shown that the moths' distribution is countrywide, but largest populations exist in mopane. After dry periods these populations explode into enormous numbers. Often the moth prefers degraded areas; collection on a large scale during explosive years has little effect on populations.
2. Through various chemical and mechanical processes, a natural, strong, amber-coloured silk can be extracted economically from cocoons.
3. An important market exists in Europe for the silk products. Silk will be bought at any stage of the processing from cocoons to woven fabric.

Now a factory has been built at Shashe to process cocoons and some 13,000 local families have already benefitted by collecting and selling cocoons. Further biological and technological investigations are necessary to see if silk moth numbers can be artificially increased, and methods found to process the silk both in the factory and possibly as a rural industry.

The value of the industry could be very large, many millions of pula, and could help 20,000 or more rural families to earn an income between May and July.



Inside the silk-processing factory, the cocoons are degummed, opened, washed, combed and carded before the finished product is sold in Europe. (AC)

Opposite:

*Cocoons of the wild moth *Gonometa rufobrunnea* from which silk is being extracted at Shashe. (AC)*

All natural resources require investigation, even if they are already used for some purpose, like *matlhouna*. The variety of these resources is enormous and, for the most part, either underused, not used at all, or not used in the best possible way.

The following examples illustrate the point.

1. Rangeland is currently used for stock grazing, hunting, fuelwood collection, building and fencing timber, thatching grass and wild plant collection. Its use is usually on an *ad hoc* and unplanned basis. Better knowledge of the land's potential could expand current uses, and some Government expenditure might vastly increase the land's productivity.

Pruning and planting trees could increase both fuelwood and construction timber; fencing areas of thatching grass could increase supply; firebreaks could protect grazing and a drift fence facilitate rotational grazing. Better knowledge of plants could disclose medicinal and food plants with commercial values; carefully controlled hunting might increase wildlife numbers and introduction of species compatible with domesticated stock could increase the value of pasture.

2. Currently water supplies are often used only for a single purpose, such as domestic use, cattle-watering or mining. Careful planning could increase the use of water and recycling could expand these uses.

A reservoir can be used for several forms of tourism for example, including picnicking and walking, sailing and boating, fishing and bird-watching, and camping. It can also allow the introduction of commercial fishing, aquaculture and horticulture while the adjoining areas protected under the reservoir legislation can be used for other activities such as forestry, natural parks or bee-keeping.

3. Many indigenous plants could be grown commercially, such as acacia for fuelwood, terminalia (*mogonono*) for fencing poles, *morama* for food, *boicia* (motlopi) for forage during droughts, and wild flowering plants for garden use.

This is not to say that some or all of these things are not already being done; rather, it reflects the fact that if they are done, it is only on a very small scale or in isolated places. Such practices should be an integral part of development everywhere.

There are two basic rules to remember:

1. Approaches to development must be integrated. In other words, when planning developments, the resources need to survive, the uses to which they will be put and the benefits to all of society should form components of a single exercise; and
2. To avoid resource degradation, there must be thorough understanding of the nature of the resources and all the likely consequences of uses made of them.

The Policy to ensure success is:

Keeping all options open, economic, biological and social, while retaining existing strengths like the cattle industry, rainfed agriculture and wild food collection;

Full participation of all sectors of society, Government, industry, NGOs, private interests and educational institutions in planning and operating development schemes;

Providing a mixture of incentives and controls, both holding out the carrot and hanging on to the reins.



Given some water, you can grow just about anything here; but it takes imagination. You must make certain that your water is used to capacity. I have a special drainage system in parts of the garden which filter used water into underground tanks for recycling.

Market Gardening

Gus Nilsen came from Sweden 20 years ago and stayed to develop Sanitas, an extraordinarily successful and concentrated market garden-cum-plant nursery.

Gus builds cement-block walls, fills protruding blocks with soil and grows plants all up them. Piles of sandbags sprout lettuces, tomatoes and strawberries. Pawpaws trained at strange angles give shade to more sensitive plants below them.

Extensive net houses produce enormous crops of sensitive vegetables while raised beds between them grow carnations for export to Europe and carrots for local consumption.

Below left:

Phuthadikobo's designs come from the village and from nature, and all reflect Botswana. Provided dust can be controlled, silkscreening can be done in rural areas giving employment outside the agricultural sector.



Rural Crafts

Phuthadikobo Museum runs a small silk-screen workshop on a crag overlooking Mochudi. The workshop prepares designs for printing on cloth, photographs them onto silk and then prints, producing a variety of tablecloths, towels, napkins, curtaining and printed materials. The workshop gives training and employment, and helps to provide the museum with running expense funds. The secretary said:

We could manage without electricity. In fact, we had to do so until it was installed a few years ago. We only need electricity for printing our designs on to cloth and we can always have work like that done in Gaborone where there are large commercial operators.

Above:

At Pilane, both domestic and wild animal skins are manufactured into shoes, bags, belts and briefcases.

It helps to have electricity, but it is not necessary. Springbok, zebra, ostrich, elephant and buffalo all produce attractive and strong skins, as good as those of cattle and goat.

By utilizing Botswana's resources, employment is created in rural areas and the levels of imported goods are reduced. For best quality products there is an export market.



Right:
Corrie Bekker employs 20 men to drive 900 or more cattle to the Lobatse abattoir.

Above:
Feedlots could be established in rural areas, such as Ghanzi and Kgong where they would also provide employment.



*F*reehold Land and Feedlots

About 17 per cent of the national cattle herd is held on freehold land where controlled grazing, better breeding and regular off-take ensure good management and substantial sales to the Botswana Meat Commission.

Recently-established feedlots take young cattle from tribal lands and fatten them for slaughter. Such a process helps to protect grazing, ensure regular off-take and achieves good grades.

A feedlot manager said

We buy young animals, feed them intensively for about three months and sell them when they are around 11 to 12 months old. This is the best age to get maximum profit.

A possibility would be for Government to establish feedlots. These could have two major purposes: to relieve pressure on the range, particularly during drought years; and to provide opportunities for everyone, including cattle-owners, to invest small sums of money by buying shares in them.

*T*he Trek to the Abattoir

Corrie Bekker has spent all his life in Ghanzi.

We make eight or more drives a year, sometimes covering the whole trek route to Lobatse, more than 500 kilometres and six weeks on the road. The Government organizes the trek route, water at regular distances and inspection for disease.

Botswana's three abattoirs have the capacity annually to process 10 per cent of the national herd yet they often operate far below capacity because of poor supply. Increasing off-take would relieve grazing pressure on tribal land, increase revenues to farmers and provide more foreign exchange.

After years of use, stretches of some trek routes have been depleted of grass, particularly east of Sekoma. At the same time, improvement in roads has made movement by cattle-truck an increasingly attractive alternative. Soon, it is likely that the bulk of cattle movement to the railhead or the abattoir will be by lorry. This could facilitate service of rural feedlots in both directions.



*B*otswana Meat Commission

The Botswana Meat Commission, with abattoirs in Lobatse, Francistown and Maun, is the largest meat processing organization in Africa with a potential annual throughput of 270,000 animals or 10 per cent of the national herd.

Carcasses are boned and chilled and frozen beef is boxed for export to many countries. Hides are sent to the tannery and by-products such as carcass, blood and bone meal and tallow are processed.

BMC is the major outlet for cattle-sales; thus, its capacity and meat pricing structure help regulate annual off-take. Variations in pricing structure could greatly assist pasture conservation.

Lower prices for animals over 30 months old would encourage the sale of younger animals, removing them from pasture before their value begins to diminish with age.

At some stage in the future some thought could be given to turning the BMC into a public company in which Botswana could invest.

Also, if higher prices are paid during dry months, July-November, this would help to spread off-take more evenly throughout the year, thus assisting BMC's quota system.

*T*he Important Goat

There are over 1.7 million goats in Botswana, 99 per cent on tribal land. Goats are poor people's cattle, providing milk, occasional meat and an income.

As browsers, they are important in grass-denuded areas since they can survive on bush, thereby helping to control encroachment. In some overgrazed areas a change from cattle to goats could be beneficial to the range.

The goat population has increased enormously over recent years, possibly even doubling in size. Goats are susceptible to the tick-borne disease of heart-water which could, as the population grows, suddenly wipe out large numbers.

The Botswana Meat Commission recognizes the problems of small stock marketing and would like to increase its intake. Currently, livestock trucks are designed only for cattle; possibilities for small stock movement by truck should be investigated, perhaps by making removable adaptations to the existing transport.

Left:

The BMC in Lobatse. The 12 countries of the European Communities make up BMC's most important market, made accessible under the beef protocol of the Lomé Convention. EC prices bring Botswana producers returns above world market values.

Above:

About 70 per cent of all farmers keep goats, with 22 animals the average herd size.



Using Elephants

Elephant hunting in Botswana was stopped in 1983 because of the suspected decline in the average tusk weight, thought to be a consequence of over-hunting. In 1986 the Government commissioned a study on the elephants in northern Botswana specifically to look at the population dynamics, seasonal movements and distribution patterns. The results of the study indicate that the elephant population has been increasing at the rate of five per cent a year. The 1989 population was estimated to be over 60,000 and could double in 15 years. What should be done?

We would like to keep the herds at about 60,000, a figure which is thought to provide a reasonable balance between numbers and habitat protection. This means removing 2,500 animals every year. Such cropping would provide meat, skins, ivory and many types of employment both in the culling area and where the skins and other products are processed. The Government would gain revenue for development.

International conservationists, witnessing the decimation of elephants elsewhere in Africa, have urged governments to put a stop to all international trade in ivory by listing the elephant on Appendix I of the Convention on International Trade in Endangered Species. Illegal trade and high prices for ivory have already destroyed much of Africa's elephant population and only strong action can save the species. Though Botswana understands the need to view the conservation of elephant from a pan-African and an international perspective, Botswana says:

The country's elephant population is healthy, outgrowing its available range, possibly posing a serious threat to its habitat and farmers' fields, and is worth thousands of pula. It should therefore be used in every possible way provided the population is kept stable. If we do not use them, northern Botswana may become badly damaged and in the next drought many will die.

The real question we should ask ourselves is: *if we trade in skins and ivory when other countries don't, would this harm international endeavours to save the African elephant?*

And the answer: *if all Botswana's ivory is sold through a controlled public auction held regularly in Gaborone, thereby making it cheaper to buy legal rather than black market ivory, the answer should be 'no'.*

To do nothing is to court disaster. More water points to spread elephants during drought combined with population controls will help Botswana's elephants. Using the elephant population for the direct and tangible benefits of rural communities in neighbouring protected areas could influence local farmers to be more positive about the conservation of the elephant as the benefits would out-weigh losses through crop damage.

Opposite:

Elephants live in extended family groups whose herds sometimes number more than a hundred beasts. Although mainly grazers, they also browse, shake trees for seedpods and fruit, rip off bark for the inner layers and sometimes break trees to reach upper canopies. During droughts, they smash large trees looking for food and can cause serious damage to the environment. At the same time, elephant spread seeds in their dung and help to generate new trees. The trick is to keep numbers of elephants in balance with their environment. (G.C.)



Top:
Hatchling crocodile being inspected. After hatching, the young crocodiles are reared in these cement tanks.

Tanks are connected into a system which can control water temperature, provision of food and drugs to keep the young crocodiles healthy. Temperature and food quantity tend to regulate their growth.

Above:
Ostrich farms are being established in several areas. Ostriches live to a considerable age in captivity, possibly as much as 60 years, and a female will lay up to 24 eggs a year, and more if they are taken away for incubation.

Ostriches feed mainly on herbs and some grass, but they also eat berries, succulent plants, insects and small reptiles.

The skins of both crocodile and ostrich make good leather and are used mainly by the fashion trade for handbags, shoes, belts, wallets and briefcases.

Traditionally, ostrich eggshell has been used by San to make water containers and beads for jewellery. A byproduct of farming will be an increased supply of eggshell for local craftworkers.

Farming Wildlife

You can look at it, own a handbag or shoes made from its skin (if you are rich), or eat it. Crocodile farms are one answer to Africa's declining Nile crocodile and three have been established in Botswana, at Kazungula, at Maun and in the Tuli Block.

I started my farm by catching adult crocodiles, some as long as four metres and weighing half a tonne. I also collected eggs from the wild, put them in an incubator and reared hatchlings.

Each farm raises about 4,000 young crocodiles with a small proportion being put into the Delta and Chobe River to ensure wild population viability.

It is very costly to set up a farm like this. It is not just the ponds which have to be kept clean, we also need incubators, rearing tanks, an abattoir and cold rooms. We need about 120 tonnes of meat a year which must be fresh, not dried. It's a fallacy to think crocodiles eat bad meat; they don't.

Crocodiles breed and grow fastest under warm conditions. They have difficulty digesting food at temperatures below 22°C. This means keeping the young crocodiles warm during winter, another major expense.

Food is the biggest problem. Where does one get 300 kg of fresh meat a day in a place like Kazungula or Maun?

Crocodile farmers are waiting anxiously for the day that elephant culling commences when they hope to be able to buy fresh meat and store it in their cold rooms. Even then, they will need refrigerated transport to collect the meat from the bush.

Right now, we are battling with enormous costs. The Government has helped by allowing us to sell young live crocodiles and some adults to stock other farms in neighbouring countries.

Survival for the first few years could mean a new industry. Other people in Botswana are turning to ostrich, with farms being established in several places. Like crocodiles, ostrich farms attract tourists and provide meat and skins. In their case, they also provide eggs and feathers.

New ventures like these offer new forms of employment and utilization of renewable resources; however, they are difficult to establish and on their own, cannot make a profit for many years. Government encouragement in the form of grants and subsidies is vital to their success, since commercial banks are often not in a position to support such long-term ventures.

Tourism

This country offers a wonderful range of unusual attractions, unique landscapes such as the Okavango Delta, interesting cultures both ancient and modern and wildlife in an unspoilt environment. Well managed tourism is unique in generating income and employment without damaging or even reducing the resources on which it is based. This is what Lucia van der Post of the British Financial Times said:

I spent 10 days in Botswana and travelled from the heart of the Okavango to the middle of the Makgadikgadi Pans. We travelled in canoes through the channels of the Okavango, saw herds of buffalo and elephant, saw fish eagles and people living in one of the most unspoilt areas of the earth.

Perhaps one of the most compelling things Botswana has to offer is its combination of scrub, desert and, right in the heart, the magical Okavango Delta, all reeds and swamps, lush palms and tiny islands.

The group she travelled with saw the Delta, rock art in the Tsodilo Hills, open grass plains, ruins of an ancient state set deep in the desert, and the white vistas of Makgadikgadi, some of the biggest salt lakes on earth. In her final paragraph she warned:

To those who have never been, who long to see the wonderful wild places, I can only say, don't wait too long. Every year something is lost.

A Tourism Policy, recently prepared, goes far to guide future developments of an industry which offers so much towards rural development.

The Policy will encourage high-cost low-density tourism, carefully graded facilities, protection of the environment and participation by Botswana.

Currently, more than 60 recognized operators provide over 40 lodges, hotels and camps in tourist areas and offer a range of experiences from tigerfishing to wildlife photography, from hunting to crawling through caverns hung with stalactites, from canoeing to rock art, from exploration of Makgadikgadi to the luxury of a casino. The annual value of the industry is uncertain, but exceeds P100 million and it has become a substantial employer in rural areas and provider of incomes for over 3,000 people.

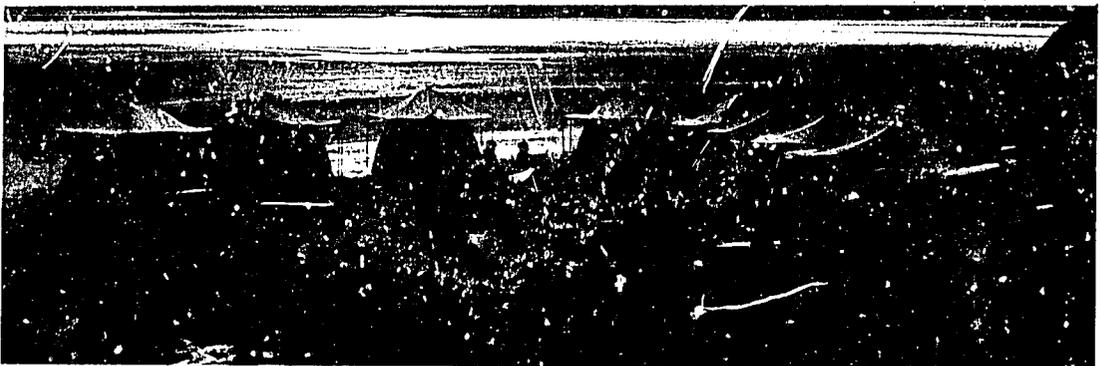
Benefits can be spread far and wide: a young girl hawking bracelets to tourists refuelling at a garage said,

These people [tourists] buy our handicrafts. In drought years it can be the difference between eating or not eating.



Nata Lodge provides accommodation, camping facilities, food and petrol to travellers on the road to Maun and Kasane.

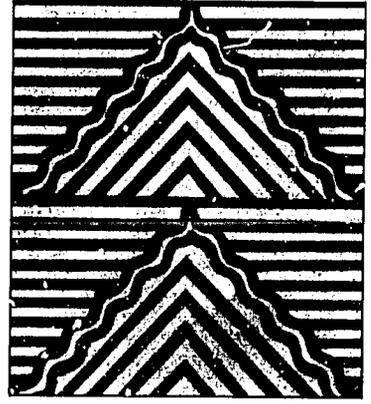
There are some 60 such lodges, mainly situated in wildlife areas in the north of the country.



Other tourist accommodation includes camps like this one specifically erected on Sowa Pan for a group of tourists visiting archaeological sites. (AC)



Chapter Six
GOING
ABOUT IT



How do we go About It?

People naturally seek solutions to overcome the difficulties of their own lives. It is the planner's job to find national solutions for the individual's everyday problems. One planner put it like this:

Most young people are more concerned with finding cash employment than they are with resources. They don't have the experience of age to help them see environmental changes and recognize resource depreciation. But for older rural dwellers, the immediate problems are more apparent, greater distances covered to collect firewood, lack of grazing around waterpoints and villages, disappearance of thatching grass, palm and wild foods, diminishing wildlife.

Then again, some problems are still in the future and so large they don't have immediate impact. As long as water comes out of the tap, most city dwellers don't really wonder from where it comes. They take pride in their growing capital city, not realizing that many water resources are already committed.

If people continue to move away from agriculture to settle in urban areas and the population doubles in 20 years, from where will the food come to feed them? Who can grow it under the existing rainfed agricultural system?

The next page shows some of the problems which require solutions. The planner must take a broader view than the individual. The public needs to be made more aware of the roots of problems since this will help to shape new attitudes towards resources management. Such attitudes will bring recognition of many rural job opportunities in forestry and wildlife management, soil and vegetation reclamation, veld product collection, horticulture, the fishing industry, tourism and related services.

On the other hand, planners tend to view rural problems in the light of their own experience and knowledge, often gained in other countries, and then expect communities to change their use of resources. One woman in the Southern District clearly put a rural viewpoint:

You can all say 'don't harvest forests, wood to sell and fodder for goats. You have the letters BA BSc after your names. I must harvest wood to sell and use fodder for my goats so that I can get money for my children's uniforms. More than that, I used to cut grass for thatching my own house, but now I have to buy it. Sometimes it is a choice between thatching the house or eating, they both cost me money and to get money I am going to go on selling wood. My BA is my hands and the resources available. I know what it does to the land even better than you because I use the resources; you use them only indirectly. You planners must accommodate my needs which means we want jobs to earn money, not advice on how to conserve our resources. You produce the jobs and you will see us look after the resources.

Opposite:

The Government's nursery at Phareng, Kanye produces a wide range of trees: fruit bearing, quick-growing such as eucalyptus, and indigenous, for sale to the public. Planting trees around homes produces shade and around fields creates windbreaks. Planting a tree and watching it grow is a unique experience, often generating life that will last long after the planter has gone. All are urged to plant trees, thus helping to replace those which are annually destroyed for fences, building, fuelwood and developments which require bush-clearing.

Views taken by the public and planners often do not coincide. It is important that both parties see both sides of the picture, if planners are really going to understand the public's problems and if the public is really going to benefit from developments.

The problems are all inter-linked: range and water supply, range and wildlife, veld products and expanding settlements, pollution and mineral development. The major link which binds them all together is the rapidly increasing human population which needs more water, space to live and resources to be employed for subsistence.

If the population remained static, as living standards rose, resource use would still increase; but with a population which doubles in 20 years, resource use must more than double in the same period if people's living standards are not to fall.

These are major challenges which have been clearly defined in the National Conservation Strategy recently prepared by the Government. Although serious, they are by no means insurmountable and many are already being addressed. They are common to all Third World countries and are also found in many First World countries. Sometimes the problems can be shared.

Public's view:
Lack of regular rainfall in the season, and periodic drought.

Lack of water

Lack of land for:

- Crop production in S.E.
- New ranches and cattle-posts; new owners on communal land.
- Foragers being displaced by pastoralism.
- Purchase in urban areas.

Declining grazing.

Lack of firewood around all large and many small settlements.

Diminishing wildlife populations, particularly in the Kalahari.

Decline in wild foods and other veld products in most areas.

Planner's view:
Climatic problems including high evaporation rates, and rise in ground temperatures.

Difficulties in finding potable groundwater at reasonable cost.

Ultimate need to transfer water over long distances.

Lack of serviced land in urban areas

An increasing rural population needing facilities including land.

Fragile environment and incipient desertification in some areas.

Deforestation in many areas and lack of alternative energy supplies.

Extinction of wildlife species in much of eastern Botswana and declining numbers elsewhere.

Elephant damage to large trees in the north.

Damage to palm groves near villages.

Lack of thatching grass.

Soil erosion.

Pollution of rivers and groundwater in some urban areas.

Littering in and around settlements, along roads and in the waterways of the Okavango Delta.

Industrial pollution.

Population growth.

Lack of employment opportunities.

Rapid increase in urban settlements and urban spread.





Setting About It

Are we aware? We must recognize what is happening to our biosphere: the soils, waters and atmosphere only a few kilometres thick which cover Earth and support all life including ours.

How do we learn more about using our resources in ways which will improve our lives?

The two sides to the story include research – learning about our resources – and education – making people aware of the real nature of their resources and how best they can be used.

Many organizations in Botswana study the environment and ways to improve resource management. These range from the Ministry of Agriculture to the University's National Institute for Research. Programmes cover many aspects from better cultivation techniques to fuelwood use, from new crops to range recovery. Such research also offers opportunities for young graduates to participate and gain valuable experience.

Training

Training for those who look after our natural resources is absolutely vital.

Maun Wildlife Training Institute was built outside the gate of the Maun Game Reserve and close to the Thamalakane River, an ideal place for giving both theoretical and practical training.

The Institute provides a wide syllabus ranging from bird ecology to National Park administration.

The Principal explains that, 'We take in game scouts and give them a basic training in all they should need to start a career in wildlife. We are also designing courses for more senior staff.'

Asked if the College was open to people from outside the Department of Wildlife and National Parks, he replied, 'Not yet, but the need for training in the private sector is fully appreciated. We expect at some stage to be offering courses to guides, couriers and employees in private game reserves.'

Research

Ello Kalake is Curator of the National Herbarium in the Village, Gaborone. In her cupboards are many thousands of carefully pressed and plants which have been collected from all over Botswana.

'We don't just collect the plant, we also collect information about it. We note its place of origin, describe its habitat and the plant itself, record its names in as many languages as possible and ask people if it has economic uses.'

'We are creating a plant geography and identification collection for Botswana. With 5,000 different species in the country, this information is vital for research into improving rangeland and other research.'

'A knowledge of distribution and the plant communities in which different species grow also helps landuse planners to ensure programmes they propose are suited to the environment.'

Shortly the Herbarium will be surrounded by a Botanic Garden so that people can see and study growing plants from all over Botswana.

Education

Pitse-ya-Naga, the Mobile Service of the National Museum has three teams which visit schools throughout the country.

Specially trained staff give talks, show slides and films, and museum materials bringing new perspectives to rural children. Says Tickey Pule, a mobile museum team leader: 'We supplement regular lessons with talks on cultures of other parts of the country, history and recent archaeological discoveries, wildlife films and slide lectures on the environment. Both children and teachers love this form of education. Everyone knows our zebra-striped trucks and are always asking when the next visit will be.'

The Mobile Museum, like the outreach programme of the Kalahari Conservation Society, the Wildlife Clubs of Botswana and the Forestry Association, is just one of many organizations helping to make people, particularly children, more aware of their environment.



Above:

Bees are easy to keep in many areas. Honey can be sold. Information on bee-keeping and hives can be obtained from the Ministry of Agriculture which has a bee-keeping unit.

Right:

Many wild animals and domestic stock are compatible. For instance, impala mainly browse on leaves, but will eat grass.

Far right:

On the other hand, cattle feed mainly on grass, but will browse when there is little grass available. Domestic stock and impala complement each other and can live side by side on the same range. Impala can survive without water except during a very severe drought.

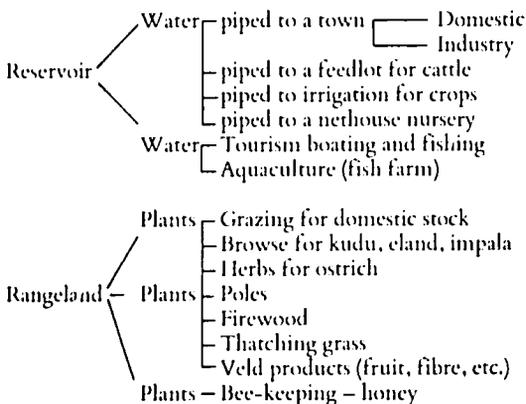
Widening the Economy

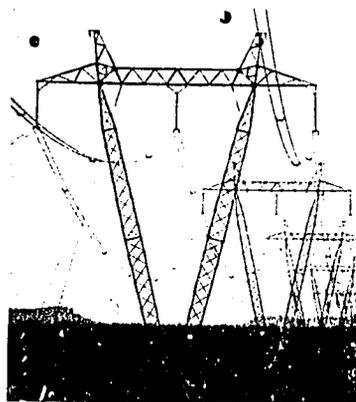
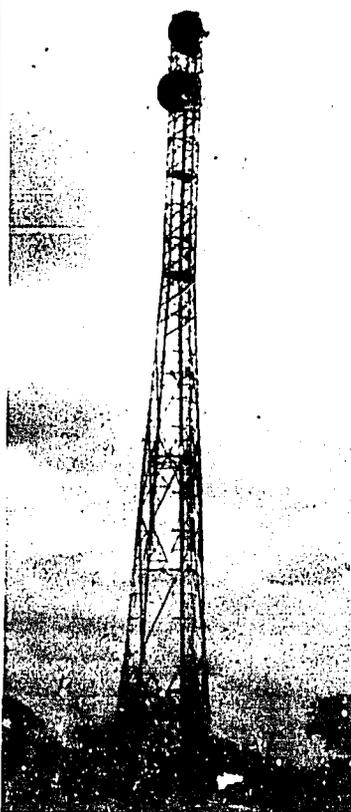
Too many people think that herding cattle on the land excludes wildlife, and vice versa. This is not necessarily true. We should make the best possible use of land in the interests of the land itself. For instance, it would be a mistake to build a town on soil suited to irrigation because such soil is rare.

The following steps indicate the best way forward.

1. Prepare a map showing the soils, vegetation, habitats, water sources and landscape of the area. This is an ecological zoning map and reflects as a whole the varying zones in the area. It suggests which areas are best suited to which activities.
2. Prepare a land use plan stating how the land will be used, i.e., crops, forestry, pastoralism, settlement, wildlife and, as appropriate, mixtures of these.
3. For projects likely to cause disruption to resources, carry out surveys, Environmental Impact Assessments (EIA's), to assess likely effects and advise mitigation programmes.
4. Ensure that local communities are involved in planning and form a part of all developments.
5. Check for performance and results; then modify as necessary.

When planning use of resources, as many non-conflicting uses should be examined as is possible. For instance:





Above:
From Mompule Power Station, power transmission lines, carried by pylons, link the station into the national grid. In this way, power stations at Mompule, Selebi-Phikwe and Gaborone are joined together to provide power for the mines at Orapa, Letlhakane, Jwaneng, Selebi-Phikwe and Francistown and for all of eastern Botswana. Cheap coal saves Botswana from importing oil, a costly and diminishing resource, to fire its power stations. Research is currently seeking ways to use coal in urban areas thus reducing pressure on surrounding woodland.

Left:
This Telecomms tower is erected on the main road from Serule to Francistown. The 'eyes' on the tower face towards other eyes on other towers and transmit telephonic information without need for wires.

Botswana Telecommunications Corporation is erecting such towers around the country to provide telephone services in every area.

To operate, the towers need electricity which is not always available. However, at the base of the tower is a row of solar panels which convert sunlight into electricity to run the tower.

Far left:
This windmill, built by RHC, Kanye, is installed on a borehole on the main road to Maun. Wind drives the simple sails attached to a wheel which spins round operating the pump. When the wind blows, water is pumped into the tank, and there is no need either for an engine or for a person to operate it.

Boreholes can also be installed with electric submersible pumps which are powered by a solar panel. With an average eight hours sunlight a day, such pumps will work on any sunny day, pumping water from borehole to tank.

Alternative Energy

Sun/Wind + X = Energy. What does 'X' represent?

'X' represents a number of devices which will convert sunshine and wind into energy. They make the user independent of transmitted power or of machines which operate on imported fuels like diesel oil.

In 40 years' time, the world's supplies of natural oil and gas will be severely depleted and alternative means to create energy must be found.

Botswana has taken two steps forward. In the first case, power stations are being changed to operate on locally mined coal rather than expensive imported oil. Secondly, experiments are being made to invent new, or test recognized, devices which will convert sunshine and wind into energy. Such devices will harness natural forces and make possible limited supplies of power independent of the national power grid or of machines which use imported oils.

Sunlight can be used to make electricity, to heat water in a solar heater and even to cook food. The wind can also drive a dynamo which generates electricity. Like all inventions, these devices require maintenance and adjustment. Experimentation and work continue to produce alternative power for rural Botswana.



As the drought lengthened, more and more cattle came to graze on the thin band of grass around Lake Ngami and drink its water. Soon they died in their thousands around the lake shores.

Future development of Botswana must allow for this natural occurrence of drought. Only by building on the sustainable use of our resources can we avoid the repetition of past horrors. Preparation of Botswana's National Conservation Strategy has laid the foundation for this future development. (AC)

A Growing Awareness

Few who experienced the horror of the 1960s drought will forget the empty lands, dead and dying cattle, long queues at labour recruitment offices, general hunger and eventually the arrival of food relief and instruction of *ipelegeng* or self-help programmes which attracted relief food. *Tlala e le itshegang*, biting hunger; it was a bad time.

And as the 1980s drought struck, we looked back, some even to the drought of the 1930s; we looked back over the dry years and the dry land, and knew that drought will always be with us, a never-ending cycle.

Obviously, such a situation, with people unable to support themselves, could not be allowed to continue; nor could relief be provided every time a drought occurred.

In 1983, the Government invited the United Nations Environment Programme (UNEP) to assist in developing solutions to the country's most serious environmental problems. In total, 15 proposals were made. The first of these pointed to the need for Botswana to prepare a National Conservation Strategy (NCS).

This appealed to the Government, especially since it accorded with the approach recommended in 1980 by the World Conservation Strategy.

Preparation of the Strategy began in 1985 with advice and strong assistance from IUCN. There was widespread consultation especially in rural areas with individuals and communities throughout Botswana. The NCS concerns the wise use of all those natural resources upon which the livelihoods of Botswana depend. The NCS has had three main aims from the start.

- To reinforce existing Government policies which require that all development is sustainable. This helps to ensure that stocks of natural resources are conserved for the benefit of future generations.

- To strengthen the Government's policies which encourage economic growth and provide employment, especially in rural areas. The development of new uses for natural resources is emphasized.
- To introduce new policies which will help to conserve and, where appropriate, to protect natural resources.

These aims are rooted in practical programmes and projects. Some of these are already in the making and are emphasized elsewhere in this book and deserve universal support. It is these sorts of projects that will provide many of tomorrow's expanding employment opportunities in areas as diverse as development of veld products, tourism, fishing, game farming, ranching, wildlife harvesting, urban parks and teaching. Some of these opportunities are described in a video, produced about the NCS, available for use in schools and colleges from the Kalahari Conservation Society.

The preparation of the NCS has already benefitted the country in many ways. The very process of consultation has made people at all levels of society much more aware of their natural resources and the need to manage them with increasing care.

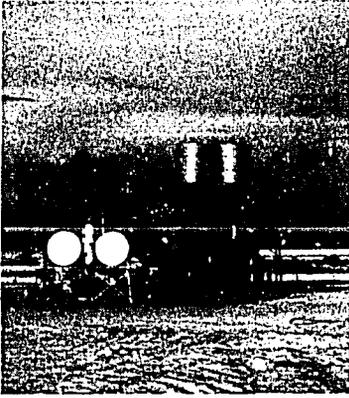
The NCS is based on 28 individual technical reports prepared by ministries and departments for their particular responsibilities. The production of these has made planners and administrators look at resources and their current uses in a new light. Already, new attitudes are being formed and increasing opportunities are becoming apparent.

One method of sustaining the momentum already generated and for implementing some of the new proposals is the planned formation of a new grassroots society to be called the 'Natural Resources Conservation Society of Botswana'.

Its originator, Seeiso D Liphuko, Deputy Permanent Secretary, Urban and Housing described it:

What we are creating is an organization which will be both free of Government bureaucracy and able to reach into the smallest communities throughout the country.

Its main aim will be to promote and encourage better natural resource uses. To do this, it will provide practical help to communities to start their own projects and to help them to raise whatever funds are needed. It will also help research projects and initiate its own where it sees an unfilled need. Finally, it will sponsor national awareness programmes through distribution of educational literature and other means.



The project at Sowa Pan. A new town and a new railway line are being constructed to utilise the massive soda-ash deposits. (AC).

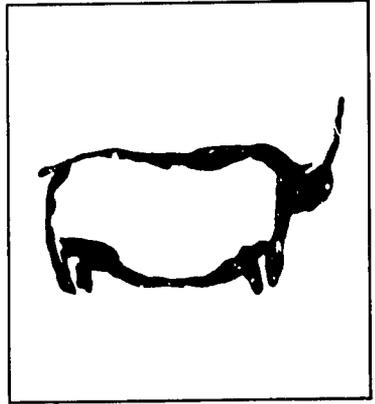
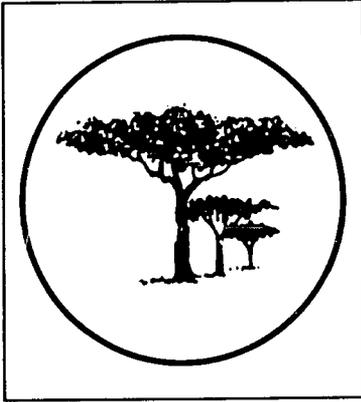
What Can We Do?

This is an imaginary interview based on the substance of many meetings held to discuss environmental problems in Botswana.

- Q.** Some important problems have been identified. What should be done to put these right?
- A.** A first solution must be job creation. The Government is tackling this in urban areas, but under-employment in rural areas has yet to be faced. It is there that resource problems are worst.
Emphasis has been placed on better education, health and water. This is important in laying foundations, but in itself does not provide jobs.
- Q.** How are jobs created in rural areas?
- A.** We must take a new look at resources there and see how they can be used. This means widening existing programmes and developing new sustainable ones. There are many opportunities.
Tourism, which doesn't actually consume any resource when well-managed, should be upgraded and widened to cover the whole country. Currently, some protected areas are not used and culture as a tourism asset has not been considered.
Repairing degradation would offer many jobs. This includes healing erosion scars, planting trees, fencing areas for ultimate protection, clearing bush encroachment.
Then there should be more research into the use of wild products like the silk moth, *morama* and *morula*. Wild animals adapted to dry conditions like eland, hartebeest and gemsbok should receive more attention as they could be ranched.
- Q.** Won't all this cost a lot of money?
- A.** Certainly it will cost money. However, we have money from mining resources like diamonds which are not renewable. Some of that money should be spent on developing sustainable programmes and environmental improvements which will be of value to future generations as well as ourselves. Aid agencies are also anxious to help with technical expertise.
- Q.** Are you worried about resources disappearing?
- A.** If you mean different types of country like tall trees along river banks, species like rhinoceros and vultures, and the genes which make one sort of cowpea different to another, what scientists call 'biological diversity', then I am very worried. When a resource vanishes, it is a tragedy because no future generation will ever be able to use it.
- Q.** How can we preserve biological diversity?
- A.** Actually, we have already done a lot. National Parks and Game Reserves protect big areas where animals and vegetation can live undisturbed. We have to make sure that such areas include populations of every different species in Botswana in numbers large enough to ensure survival.
Then, we have laws protecting endangered species of animals and plants. We must make sure these laws are really effective.
- Q.** What else should we do?

- A. We need to know much more about plants and animals. For instance, agricultural research has identified over 800 different types of cowpea in Botswana; but these types are disappearing. We need to know for the cowpea and for many other species what genes they have and how they can be protected for the future.
- Q. In fact, there is a lot to do, and everything we do will mean more jobs, mostly in rural areas.
- A. Well, we have only looked at one side of the story. All developments like new roads, dams, towns, and even agricultural fields must cause some damage both to the natural environment and to the people who have always used the area for their subsistence. Before starting to develop, proper surveys should be made to assess the likely damage and see how much of it can be prevented.
- Q. Can you describe such a survey?
- A. Yes, it is usually in a number of parts. When the area to be affected by development has been decided, then specialists examine it to see what will happen to it through the planned developments. Specialists include ecologists, foresters, biologists, sociologists, hydrologists and even archaeologists. They submit reports on their findings which are integrated to give an overall picture of what is likely to happen. They also say what should be done to minimize the effects on both the environment and the people that live there.
- Q. Is this also expensive?
- A. Not necessarily. Often, such surveys actually save money in the long term. Preventing damage is often cheaper than putting it right later.
- Q. Finally, what would you advise us to do?
- A. We should look at resources to see how many different uses they have, which are the most productive on a sustained basis, how the use of different resources can be linked together and which uses will benefit the people. Many NGOs are doing a good job and should be given encouragement and support.
- Q. Can you give an example?
- A. Let's take an area of low quality pasture. Is it more suitable for cattle and/or goats? Would it be more suited to wildlife? Would it be possible to keep both livestock and wild animals on the same land? Is some of it good thatching grass and should this be fenced for annual cutting. Could fuelwood or fencepost also be cut? Is there wild food like *mogose* or *morama*? If the land is given to one man to ranch cattle, only he will gain and because the land is poor quality, it may deteriorate. If it is put to all the uses listed above, a number of people will benefit and one may still be able to make a living from keeping just a few cattle while another may make money from ostrich or springbok, or keeping bees for honey.

Looking at rural developments in all these ways will help to protect resources, increase uses on a sustained basis and create employment. Employment in turn will provide money, allowing people to buy resources without having to take them from the land.



*Above, left to right:
Forestry Association of Botswana
Kalahari Conservation Society
The Botswana Society*

*W*hat is an NGO?

An NGO is a Non-Governmental Organization. Each is a specialist of some kind, often described in its name: Young Women's Christian Association, Forestry Association of Botswana, Red Cross, Botswana Council of Women, Botswana Philatelic Society.

NGOs are groups of dedicated or interested people who join together to provide a service to the community. The work they do is often little recognized, at either national level or by the public. The public is frequently unaware of the real services that NGOs perform.

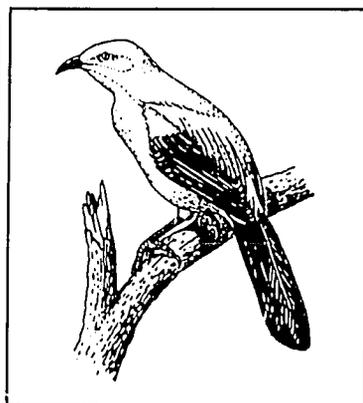
*W*hich NGO do You Belong to?

Are you concerned about wild animals in Botswana? Many schools have Wildlife Clubs which help children to learn more about the natural environment and sometimes make expeditions to places like Chobe National Park. Or, you can join the Kalahari Conservation Society which runs its own education programme, undertakes wildlife and environmental studies, hosts lectures, shows films, and helps the Government to manage wildlife.

Are you concerned about plants and trees? Have you joined the **Forestry Association of Botswana**? FAB runs all sorts of interesting programmes from sponsoring National Tree Planting Day to establishing Seed Bank Botswana which collects, preserves and supplies seeds of indigenous trees. Their objectives include protection of forests, bush, trees and shrubs; promotion of local research into forestry; encouragement of forest industries and related employment throughout the country, and provision of forestry information and extension work.

Thusano Lefatsheng aims to meet the needs of rural people for alternative sources of income, by developing new cash crops and techniques and extending these to the farmers in project areas. The organization is engaged in all aspects of the introduction of these new crops from research and extension among local farmers to processing and marketing both locally and abroad.

The Wildlife Clubs Association of Botswana promotes the formation of Wildlife Clubs in schools (mainly secondary schools), colleges and the university, and services the clubs once formed. The central co-ordinating body of WCAB produces *Heritage* magazine for members, broadcasts radio programmes and assists registered clubs by showing films and organizing lectures. Most important, Wildlife Club members learn about conservation through their participation in activities such as tree-planting, field excursions to national parks, litter campaigns, debates and rallies. Many of the activities are organized in such a way that they create a wider conservation awareness among members of the community, thereby multiplying the message.



*Above, left to right:
Wildlife Clubs Association of Botswana
Thusano Lefatsheng
Botswana Bird Club*

The **Kalahari Conservation Society** aims primarily to promote knowledge of Botswana's rich wildlife resource and its environment through education and publicity. Its education unit produces and distributes materials on various conservation and environmental topics. In addition, it has a small library of videos. Projects have included a pilot computerized licence programme in Ngamiland and Chobe assisting the Department of Wildlife and National Parks in these regions, environmental impact assessments, a management plan for the Central Kalahari Game Reserve and aerial surveys. Landuse plans for the Makgadikgadi region, Ngamiland Statelands and Okavango Delta were completed recently for local and central Government.

The Botswana Society encourages research and scholarship on Botswana with particular emphasis on archaeology, environmental use, law, geology, natural history and religion. It publishes an annual journal *Botswana Notes and Records*, proceedings of symposia and workshops which it holds, scientific papers and books on the country. It organizes a regular lecture series and expeditions to places of natural or historic local interest. It helps to finance research and organizes its own research projects.

The **Botswana Bird Club's** main objective is to promote knowledge of the country's varied bird life through meetings, lectures, a regular publication *The Babbler*, a newsletter, bird walks within 50 km of the capital and longer field trips. It is particularly concerned with compiling bird records which contribute towards a national and a Southern African atlas.

By becoming a member of an NGO you are helping Botswana. Your subscription helps the organization and you will receive a newsletter or journal which tells you what your organization is doing and gives you valuable information about its speciality. However, to take part in some NGO-sponsored activities, like tree planting, you don't even have to be a member.

Look at the list of NGOs which are concerned about the environment. Perhaps there is a branch in your area. Write for details and apply for membership.

The Botswana Society
P O Box 71
Gaborone

Kalahari Conservation Society
P O Box 859
Gaborone

Botswana Bird Society
P O Box 71
Gaborone

Forestry Association of Botswana
P O Box 2088
Gaborone

Wildlife Clubs Association
of Botswana
Co-ordinator
P O Box 131
Gaborone

Thusano Lefatsheng
Private Bag 00251
Gaborone



*H*ow Can I Help?

I want to make Botswana rich and beautiful; how can I help?

For the student: Learn as much as you can about your country and its resources; learn the names of trees, birds and other animals, and see how they live, and what they need. Join one of Botswana's wildlife clubs.

For the farmer: Look after your soil and try to keep it fertile by rotating crops.

For the cattleman: Watch your pasture. Herd your cattle. Match stocking rates to carrying capacity.

For manufacturers: Don't let your factory cause pollution, either through acid smoke or through chemical effluent.

If your product includes potential litter such as aluminium, tin, plastic or foil, suggest a disposal method on the packaging, or recycle it.

For the planner: Are resources being used on a sustainable basis? Are linkages between uses being ignored? Do the largest possible number of people benefit? When planning, ask yourself these questions.

For the financier: Look at projects on a long-term basis and ensure that quick profits at the expense of resources are not intended.

Do not ignore projects which will have little return if they will benefit the environment.

Remember that small projects can also be valuable projects.

For town-planners: Recognize traditional values and settlement patterns.

Make towns tranquil through open areas, parks and playgrounds.

For the developer: Ask what effect will development have on the environment? Do not develop before a thorough environmental impact assessment has been made and all possible actions taken to mitigate damage. Look to enhance the environment through development.

For the politician: Are the needs of all being taken into consideration? This includes both the influential and the poor who have little voice to call attention to their needs.

Do the decisions you make take into account the needs of the environment as well as those of the people?

For us all:

Are we making the best use of water?
If possible store rainwater from building roofs in a tank. Turn off taps and don't waste water.

Plant trees around your home for shade and fruit; plant trees at your lands and to make windbreaks.

If you see litter lying around, please pick it up and dispose of it in the proper place; even if it is not your litter.

Prevent erosion by putting stones and dead branches in gullies to stop soil washing away.

Have smaller families.

Ask your Village Development Committee what you can do to help make your village more beautiful.

Join a Society involved in some form of nature conservation and learn all you can about Botswana's natural resources.



And here are a few don'ts:

Don't waste water.

Don't light fires which can spread to burn the bush and grass.

Don't damage plants by cutting live trees unless it is necessary, and when collecting wild food, medicinal plants or plants to make handicrafts, don't take so much of the plant that it is killed.

Don't chase wild animals in a motor vehicle and don't hunt scheduled animals without a licence.

Don't throw cans beside the road, don't allow plastic bags to blow away, don't dump litter; either bury it, burn it, or dispose of it through municipal collection.

Don't use poisons unless you know that they are biodegradable.

The future of our country depends on us. We should always think before we act: Is what I am doing wasteful? Will my children and their children also be able to use these resources in the same way that I can? With these thoughts in mind, we have taken a big step forward.

If we ask ourselves the questions: Will what am I doing help increase the potential of these resources, and will it make our environment a better place? then we have taken another stride forward.



Acknowledgements

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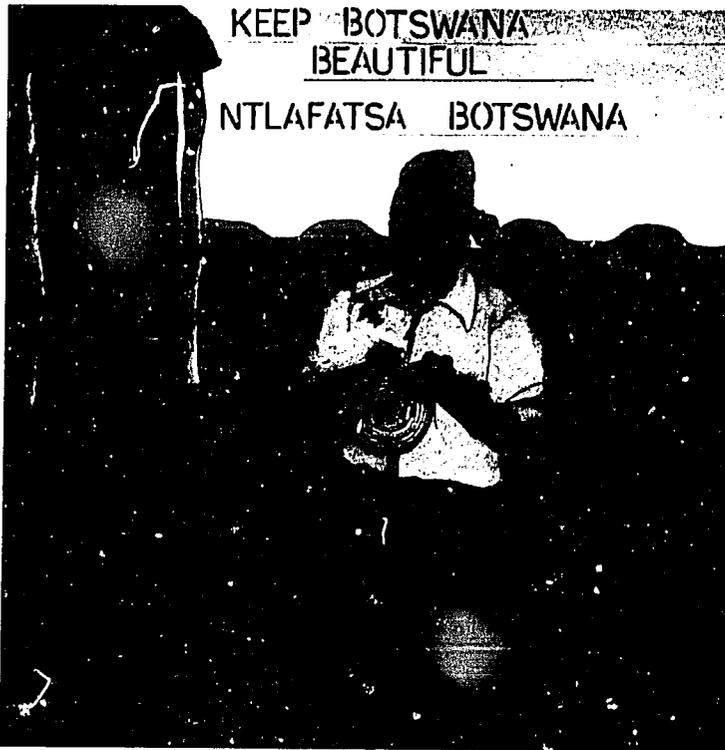
Original painting by R. Mokandla of Molepolole College of Education, selected from the 1988 National Conservation Art Competition organized by the Kalahari Conservation Society and the Wildlife Clubs Association of Botswana.

Glossary

Barbel	Catfish, <i>Clarius</i> spp. Species of fish with fleshy whiskers hanging from the mouth.
Baobab	Tree with enormously thick stem, <i>Mowana</i> or Monkey-Bread tree, <i>Adansonia digitata</i> .
Basarwa	San or Bushmen, the earliest modern inhabitants of Southern Africa.
Biodegradable	Products made from once-living material which, because of their nature, when discarded slowly decompose and eventually disappear leaving no obvious trace of their existence.
Browse	Feed on the leaves of woody plants as opposed to grazing on grass.
Borehole	A hole drilled vertically downwards into the earth, sometimes to considerable depths, usually to obtain water from underground sources.
Bushbaby	Lesser galago or night ape, <i>mogwele</i> , <i>Galago senegalensis</i> .
Acacia	A large family of thorny trees and bushes including such species as <i>mongana</i> , <i>mooka</i> , <i>mosu</i> , <i>mogothlo</i> .
Carrying capacity	The number of livestock which a particular type of land can support before overgrazing occurs. Usually measured by the hectare; thus, one cow to five hectares of land is a measure of the land's carrying capacity meaning a five hectare area can support up to one cow.
Cordon fence	A double or single wire fence erected over a considerable distance to stop the movement of domestic stock from one area to another, so preventing the spread of disease.
Cowpea	<i>Dinawa</i> , <i>Vangueria unguiculata</i>
Crow	<i>Legakabe</i> , <i>Corvus</i> spp.
Desertification	Loss of vegetative cover, mainly grass species, to the point where open areas of bare soil occur and wind begins to shift surface sand.
Dietary moisture	Liquid obtained by eating plants and sometimes the dew on them, as opposed to drinking water.
Ecosystem	All the living things in an area – its plants and animals – plus the soils, rocks and water without which the living things could not survive.
Environmental conservation	The care or use of the environment in ways which ensure its future sustained production.

Environmental Impact Assessment	A survey made early in the planning stage of a new development. The 'EIA', as it is often called, looks at all the possible effects a new project could have on the environment and suggests how bad effects can be limited.
Evapo-transpiration	Loss of moisture to the air from land, water surfaces and plants.
Feedlot	A place where cattle are held in small pens and fed concentrated food to fatten them for slaughter.
Fragile Range	Vegetation, particularly grasses, which grow on loose sand and which are easily damaged by overuse.
<i>Gonometa</i> spp.	Moths indigenous to Botswana and neighbouring countries whose caterpillar produces a cocoon from which wild silk can be extracted.
Grapple plant	<i>Sengaparile</i> , <i>Harpagophytum procumbens</i> .
Habitat	The natural area where a plant or animal is found.
Hamerkop	<i>Mamasilanoka</i> , <i>Scopus umbretta</i> .
Hardveld	Country mainly in the east of Botswana where soils are firm, rocks are close to or break the surface and there is no cover of Kalahari sands.
Ipelegeng	Self-help. Projects and programmes, often community based, in which people join together to perform tasks such as building, road and erosion repair, for little or no remuneration.
Jacana	<i>Aetophilornis africanus</i> or Lily-trotter.
Ka Setswana	According to Tswana customary belief.
Kgengwe	The wild melon, <i>Citrullus lanatus</i> .
Kgori	Kori bustard, <i>Ardeotis kori</i> .
Kgosi	Traditional ruler, king or chief. <i>Dikgosi</i> – plural.
Kgotla	Traditional group meeting place where community affairs are conducted. <i>Dikgotla</i> – plural.
Letsholo	A tribal hunt involving one or more regiments, often organized by the kgosi before a battle or at a time of community tension.
Lolwapa	Courtyard containing the home of a family.
Maḽisa	Traditional system of allocating the use of livestock to strengthen social and other links.
Matlhowa	Cocoons made by a caterpillar. Letlhowa – singular.
Marupantse	A selection of sorghum seeds recognized for their hardiness including resistance to mildew.
Mogose	<i>Bauhinia</i> spp. A shrub. Its pod contains an edible bean.
Mokamba	A tree, pod mahogany. <i>Azelia quanzenensis</i> .
Mokusi	A tree, rhodesian teak. <i>Baikiaea plurijuga</i> .

Mokoro	Dugout canoe made from tree trunks of certain species. <i>Mekoro</i> – plural.
Mophane	<i>Colophospermum mopane</i> .
Morama	<i>Tylosema esculentum</i> . Has edible nuts and tuber.
Morukuru	A tree, <i>Spirostachys africana</i> , Tamboti.
Morotomadi	A tree. Bloodwood or mukwa, Kiaat, <i>Pterocarpus angolensis</i> .
Motlopi	Shepherd's tree. <i>Boscia albitrunca</i>
Pan	A depression in the landscape, normally with a flat bottom either bare or grass-covered which may temporarily fill with water. The bed of an ancient lake.
Pastoralist	Person whose important subsistence depends on livestock.
Qho	A group of Basarwa or Bushmen living in the Kgalegadi and Ghanzi Districts.
Resources	Materials from the natural environment which are used for human activities. They include plants, animals, soils, and other things which we use for living.
Savanna	Flat land covered mainly by grass, but also interspersed with bush and low woodland.
Satellite	A machine launched into space by man which usually circles the earth at a great height and can be used to photograph the earth's surface.
Segalane	A selection of certain types of sorghum seed known for their hardiness.
Soda ash	Sodium carbonate, a major component of the floor of the Makgadikgadi Pans which can be used for many purposes including glass-making.
Sengaparile	See 'grapple plant'.
Trek route	A route with regularly spaced boreholes along which cattle are driven, usually from their place of origin to an abattoir.
Tilapia	Species of bream, fish, <i>Tilapia</i> spp.
Tsaudi	A tree, <i>Guibourtia coleosperma</i> , rhodesian mahogany.
Wilderness	Areas of country which remain in their natural state and where human-made developments are minimal. Today, it is a rare and often valuable resource.



Above: 'Keep Botswana Beautiful' – This painting by K Gaosebale of Lotsame Secondary School took First Prize in the 1988 National Conservation Art Competition.