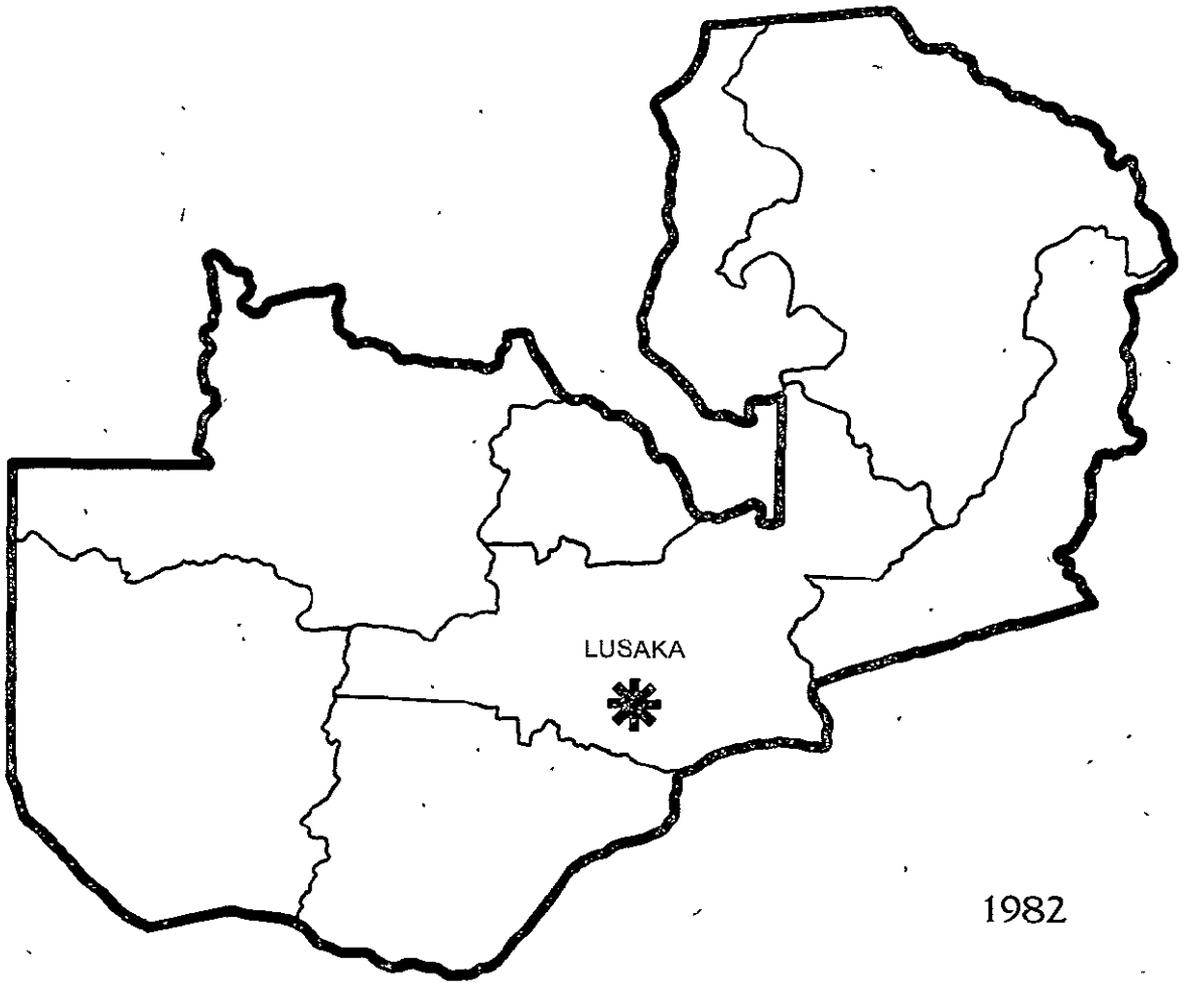


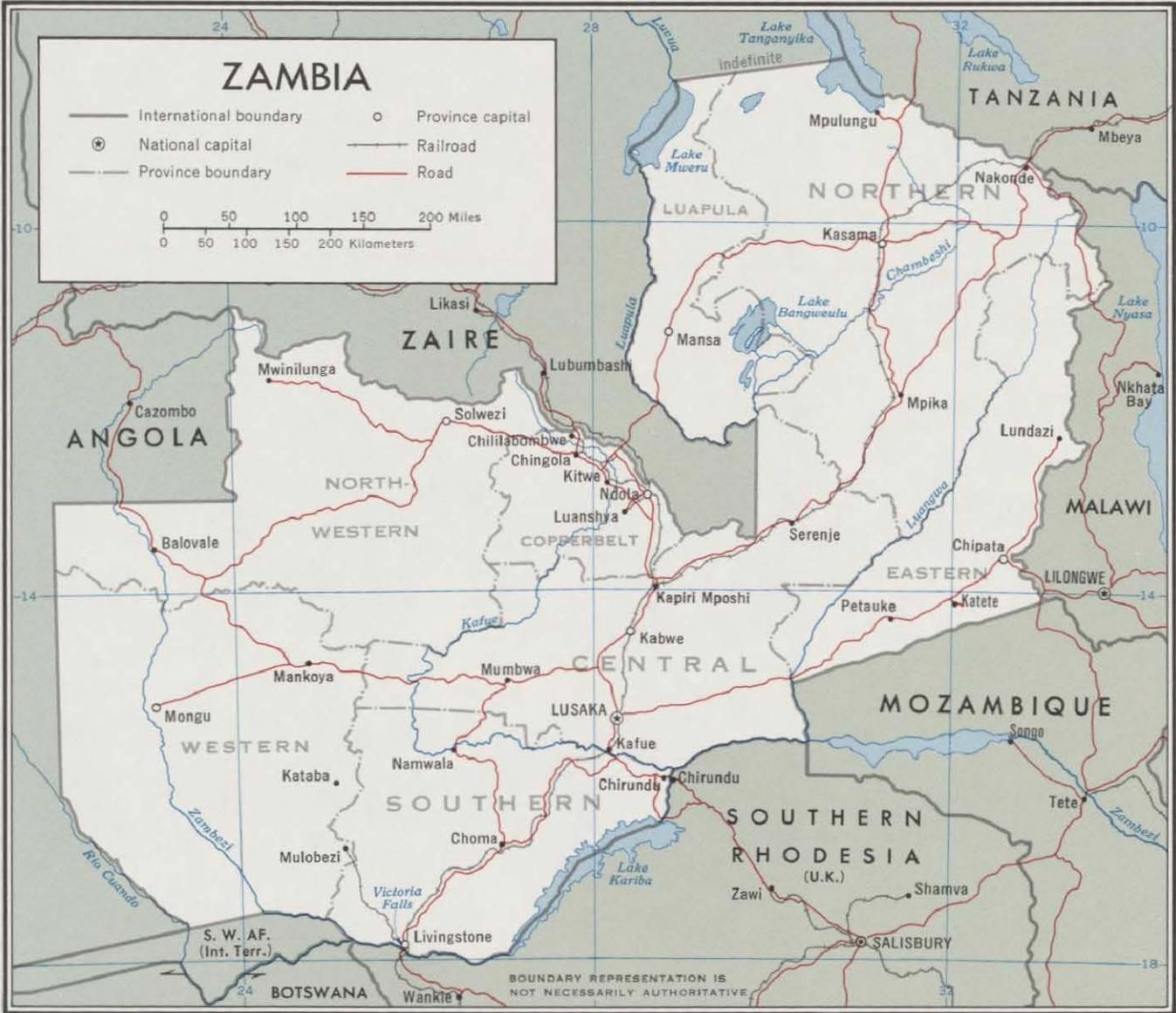
Zambia

A Country Profile



1982

Office of U.S. Foreign Disaster Assistance
Agency for International Development
Washington, D.C. 20523



Base 503205 12-76

ZAMBIA: A COUNTRY PROFILE

prepared for

The Office of U.S. Foreign Disaster Assistance
Bureau for Private and Development Cooperation
Agency for International Development
Department of State
Washington, D. C. 20523

by

Evaluation Technologies, Inc.
Arlington, Virginia
under contract AID/SOD/PDC-C-0283

The profile on Zambia is one in a series designed to provide baseline country data in support of the planning and relief operations of the Office of U.S. Foreign Disaster Assistance (OFDA). The content, scope, and sources have evolved over the course of the last three years, and no doubt will continue to do so. The relatively narrow focus is intentional. To avoid redundancy, some topics one might expect to find in a "country profile" are not covered here.

If the information provided can also be useful to others in the disaster assistance and development communities, so much the better. Every effort is made to obtain current, reliable data; unfortunately it is not possible to issue updates as fast as changes would warrant. A cautionary note, therefore, to the reader: statistics are indicators at best, and if names and numbers matter, the bibliography will point to a current source.

We invite your comments and corrections. Address these and other queries to OFDA, A.I.D., as given above.

December 1981

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1. Environment

1.1 Topography

Zambia is a landlocked country of 752,614 sq. km. situated on a portion of the vast plateau that makes up most of central and southern Africa. Most of the terrain is flat or slightly undulating, with elevations ranging between 900 and 1,500 meters. Mountainous areas are found in the northwest along the border with Zaire and in the northeast along the borders of Malawi (the Mafingi Mountains) and Tanzania (The Mbala Highlands). Major lowland areas (below 900 m.) are the Luangwa River Valley in the east and the Zambezi River Valley along the border with Zimbabwe. Both of these river valleys are edged by escarpments: the Muchinga and the Zambezi, respectively.

Five ecological zones can be distinguished in Zambia:

Northern high rainfall zones - covers most of northeastern and northwestern Zambia. Frequent heavy rains that wash nutrients from the soil necessitate the practice of shifting agriculture in these areas. Population densities are low and local communities move every so often as soils become temporarily exhausted. The Bangweulu swamps and the northern part of the Wapula valley are exceptions to this pattern. In these areas hoe and/or plow agriculture is practiced and the availability of fish has led to more settled communities as well as higher population densities.

Western semi-arid plains - covers all of Western Province and parts of Northwestern, Central, and Southern provinces. The aridity of this region is due primarily to a high rate of evaporation rather than to low rainfall. The Barotse Sands (also called Kalahari) that cover this area retain little moisture and only on the floodplains of the upper Zambezi River is any cultivation possible.

Plateau region, including the Tonga Plateau, the Kafue Flats, and the Lukanga Swamp - comprises most of Central and Southern provinces. Although annual rainfall is less than 1,000 mm., some of the most fertile soils are found in this region. Sedentary agriculture is the predominant occupation and population density is high.

Southeastern plateau zone - bounded by the Luangwa River Valley and the borders of Malawi and Mozambique. Annual rainfall of between 800-1,000 mm. and favorable soils allow relatively intensive cultivation.

Rift valleys of the Luangwa and middle Zambezi rivers - includes the Muchinga and Zambezi escarpments. Poor soils and low and erratic rainfall combine to make this region of little agricultural value.

1.2 Climate

Dry cool season: April/May - August; June and July are the coldest months. Frost occurs occasionally, rain rarely.

Dry hot season: August - October. In October temperatures rise, reaching their highest levels of the year. In early November cooler oceanic air moves in, increasing humidity and cloud formation.

Rainy warm season: November - April/May. The main rains occur in late November and December. April/May is a transitional period with rains tapering off in May.

Mean annual rainfall ranges from about 1,475 mm. in the north to 710 mm. in the south. Rainfall is heaviest in the northwest and the north-east above Lake Bangweulu. Average annual rainfall in these areas ranges between 1,000-1,400 mm. The central regions of Zambia generally receive between 800-1,000 mm. per annum. Rainfall is lowest (under 800 mm.) and most erratic in the south and in the lowlying areas of the southeast; drought occurs occasionally in the latter region. (See Drought, section 2.1.)

Average Precipitation (Inches)

<u>Station</u>	<u>Eleva- tion *</u>	<u>J</u>	<u>F</u>	<u>M</u>	<u>A</u>	<u>M</u>	<u>J</u>	<u>J</u>	<u>A</u>	<u>S</u>	<u>O</u>	<u>N</u>	<u>D</u>	<u>Year</u>
Balovale	3,577	8.5	6.9	5.8	1.2	-	-	-	-	0.3	2.3	4.4	8.9	38.3
Kasama	4,544	10.7	9.9	10.9	2.8	0.5	-	-	-	-	0.8	6.4	9.5	51.5
Lusaka	4,191	9.1	7.5	5.6	0.7	0.1	-	-	-	-	0.4	3.6	5.9	32.9

* feet

Source: U.S. Dept. of Commerce, Climates of the World, 1972.

Temperatures are generally moderate due partly to the altitude and partly to the cooling effect of the frequent cloud cover. The highest daily mean temperatures occur in October, the lowest in July. Recorded extremes have ranged from 44°C in the Luangwa Valley to -7°C at Sesheke in the southwest. Although temperatures are usually lower in the mountainous northern regions, rapid heat loss at night can cause dramatic temperature drops in the flat sandy plains of the southwest.

Average Daily Temperature (°F)

	Jan		Apr		July		Oct		Extreme	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
Balovale	82	65	84	61	81	47	91	64	108	38
Kasama	79	61	79	60	76	50	87	62	95	39
Lusaka	78	63	79	59	73	49	88	64	100	39

Source: U.S. Dept. of Commerce, Climates of the World, 1972.

1.3 Vegetation

Plateau - wooded savanna with tall perennial grasses and small trees. The grasses catch fire easily in the dry season, causing the trees to develop a fire-resistant, cork-like bark. Soils vary from sand to sandy clay, usually high in acid, low in humus.

Lowlands (Zambezi and Luangwa valleys) - mopane trees, short-lived annual grasses, and a few perennial herbs. Soils are highly fertile alluviums.

Woodland - evergreen forests, notably Rhodesian teak, is found in parks of the southwest. Wooded areas also make up portions of the Bangweulu Depression. Over 8% of the country has been set aside as forest reserve.

Swamps and floodplains - these areas do not permit tree growth, but grasses support livestock as well as wildlife. Erosion is a major problem.

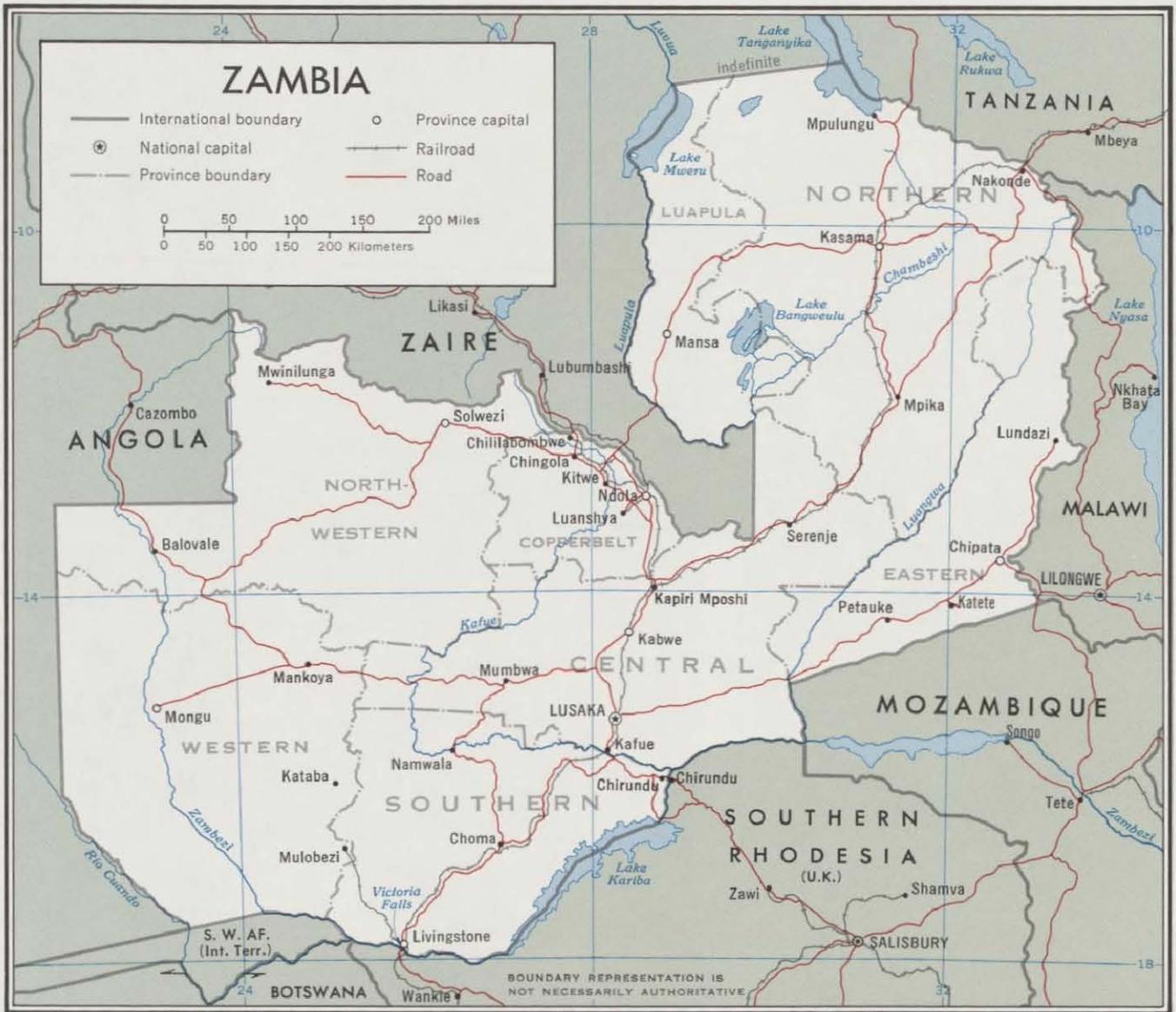
1.4 Waterways

Most of Zambia's rivers and streams drain into the Zambezi River which eventually flows into the Indian Ocean. Besides the streams that enter the Zambezi directly, there are three main tributary systems, the Kafue, Luangwa, and Lusemfwu rivers, that drain the western portion of the country. The water courses in the northeast drain into the Zaire River which makes its way ultimately to the Atlantic Ocean.

The Bangweulu swamp, a shallow depression containing about 10,360 sq. km. of lake and swampland, is situated in the northwest. Zambia also shares three lakes with her various neighbors: Lake Tanganyika with

Tanzania, Lake Mweru with Zaire, and Lake Kariba with Zimbabwe. Fishing is an important occupation in these areas and along the major rivers.

The flow of all waterways in Zambia is affected by the change of seasons. Most small streams dry up sometime between May and October, and even larger rivers show a substantial difference between maximum and minimum discharges. Because of natural obstacles, rivers are used little for transport. The lakes in the north carry some local transport and Mpulungu, a small port on Lake Tanganyika, handles a small quantity of goods. (See Transportation and Logistics, section 7.) However, water resources are vital for power production for mines and urban areas. (See Electric Power, section 8.1.)



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2. Disaster Vulnerability and Preparedness

2.1 Drought

Although droughts do occur, they are usually localized and of relatively short duration. Most vulnerable to drought are the arid western plains (Western Province and parts of Northwestern, Central, and Southern provinces) where a high evaporation rate leaves little moisture in the porous sandy soil. However, as evidenced in the current crisis, little or no rainfall in major maize producing areas, combined with transportation and distribution problems, can cause food shortages throughout the country. According to FAO, famine conditions have been reported in the Western Province districts of Shesheke and Senanga affecting local populations displaced by border conflicts and refugee populations from Angola and Zaire. Security problems have interfered with the planting of crops in these districts and food shortages are expected to continue throughout 1981. The Government of the Republic of Zambia (GRZ) has mounted relief operations but these have been hampered by transportation difficulties. FAO/WFP emergency food assistance is being provided to feed 24,000 people for nine months. (See also Current Status of Agriculture, section 5.2.)

2.2 Refugees

At the present time there are approximately 43,000 refugees in Zambia consisting of about 25,000 Angolans, 10,000 Zaireans, 3,500 South Africans, 3,000 Namibians, and approximately 1,500 others from various countries. The UNHCR is currently assisting in the development of a refugee settlement at Meheba for 9,000 Angolans, 600 Zaireans, and 150 Namibians. The GRZ will take over operation of the settlement at the end of 1981. The UNHCR also has an on-going refugee program in Zambia which emphasizes education, counseling, employment, and self-help.

2.3 Environmental Degradation

Until recently low population density in rural areas held deforestation to a minimum and the plateau terrain protected against soil erosion. However, rapid development has accelerated resource depletion and, without proper control, could threaten future growth. A lack of data (through environmental monitoring) is a major obstacle to government planning and legislation. Although regulating legislation does exist for water pollution and destruction of natural resources, implementation is rare and no laws exist to control air pollution or land use.

In May 1979 an environmental seminar, financed by USAID through Clark University, was held in Lusaka to encourage the establishment of natural resource assessment projects. Three areas were targeted as needing immediate attention:

- Deforestation and soil erosion - soil erosion due to overgrazing, poor agricultural practices, and loss of topsoil is reducing agricultural productivity. Clearance of forests for citemene agriculture (see Land Use, section 5.3) and for charcoal burning threatens to leave the country bare in 30 years unless control measure are instituted.
- Declining wildlife and fish populations - poaching of wildlife, primarily for the urban meat market, and uncontrolled fishing threaten to eliminate these resources. Lakes are now providing maximum catches and some types of fish have already disappeared due to overfishing.
- Air and water pollution - in Copperbelt Province and around Kabwe air pollution is so bad chest complaints are common. Industrial pollution, though restricted to a few areas, is concentrated near the Kafue River, a major drainage system, causing water contamination and reduced levels of oxygen in the river.

2.4 Disaster History

Summary Disaster History

<u>Disaster</u>	<u>Date</u>	<u>Location</u>	<u>No. Killed</u>	<u>No. Affected</u>	<u>DKM</u>
Civil Strife	08/64	NE Districts	300	3,000	4
Mine Accident	09/70	Mulfulira Cooper Mine	89		2
Flood	02/78	Lusaka	11	30,000	4
Civil Strife	10/78	Rhodesian Border	n.a.	1,000	n.a.

Source: OFDA Disaster History data base at the Office of U.S. Foreign Disaster Assistance in Washington, D.C. Covers 1900 to the present.

2.5 International Assistance

Zambia receives assistance in the form of loans and technical assistance grants from over 50 countries and institutions. In 1979 these groups gave approximately \$102.7 million for technical assistance projects in agriculture, health, education, transportation, communications, and national resource planning. Coordination among donors in Zambia is haphazard and generally achieves little more than avoiding project duplication. There is no central place (or person) within each ministry functioning as a clearinghouse for information on other donor activities.

2.6 Red Cross

The Zambia Red Cross Society has five chapters and about 30,000 members. They provide first-aid training and are available to assist in providing emergency care.

2.7 Voluntary Agencies

Africa Evangelical Fellowship

P.O. Box 1981, Lusaka

Operates two hospitals, a clinic, and leprosy and TB programs

American Friends Service Committee

P.O. Box RW 141, Lusaka

Involved in community development/housing projects

Brethren in Christ Missions

Box 115, Choma

Operates two hospitals and five clinics

Direct Relief Foundation

Provides medical equipment and supplies

Franciscan Mission Association

St. Francis Custody, P.O. Box 35, Solwezi

Operates two hospitals and a leprosy treatment center; also operates eight schools

Luthern World Ministries

Zambia Christian Refugee Service

P.O. Box 2778, Lusaka; Tel. 51358

Community development programs

MAP International

Makes shipments of donated medicines and hospital supplies

Mennonite Central Committee

Plot 114B, Ngwerere Rd, Lusaka

P.O. Box 3086; Tel. 53456

Programs in education, agriculture, medicine and public health, and social welfare

Salvation Army

9 Kabwe Rd., P.O. Box 4352, Lusaka

Programs in education, medicine and public health, and social welfare

United Methodist Church

Mindolo Ecumenical Foundation

P.O. Box 1493, Kitwe

Programs in community development, education, and medicine and public health

Wesleyan Church

P.O. Box 745, Lusaka

Operates four dispensaries

White Fathers of Africa

P.O. Box 94, Mbala

Programs in food production and medicine and public health

YMCA

c/o National Council of YMCA's

P.O. Box 1229, Kitwe

Programs in community development and education

YWCA

P.O. Box RW115, Lusaka

Programs in education and medicine and public health

3. Population

3.1 General Population

Total population	5,679,808
No. males	2,785,469
No. females	2,894,339
Sex ratio (males to females)	962:1,000
Average annual growth rate (1969-80)	3.1%
Urban population	43%
Urban growth rate (1969-80)	6.7%
Average density/sq. km. (1974)	6.4
Rural density/sq. km. (1974)	4.0

Note - figures are for 1980 except where noted.

Source: Republic of Zambia, 1980 Census of Population and Housing, January 1981 and the World Bank, Zambia Country Economic Memorandum, 1981.

3.2 Regional Population

There are four rural areas with high (10-50 persons per sq. km.) population densities: 1) the agricultural zone running along the major rail line; 2) the highly fertile southeast corner; 3) the flood plain of the Upper Zambezi and its western tributaries; and 4) areas adjacent to bodies of water in the northeast and the highland area along the border with Tanzania. These areas are all of high economic value either as agricultural/livestock centers or as fishing centers. Except for the Luapula Valley (where fishing is important) all of these densely settled areas are free of the tsetse fly.

Two large areas that are sparsely populated (fewer than 2 persons per sq. km.) are the middle Kafue Valley and the Luangwa Valley and the adjacent Muchinga Escarpment. Poor soils, unreliable rainfall, and the presence of the tsetse fly discourage human settlement in these areas. Several smaller areas in the far northwest, far southwest, and scattered areas in the northeast are also thinly populated, due largely to poor soils.

Population by Provinces, 1980

<u>Province</u>	<u>Males</u>	<u>Females</u>	<u>Total</u>	<u>Average Annual Growth Rate (%) (1969-80)</u>
Central	258,773	255,062	513,835	3.3
Copperbelt †	642,667	606,221	1,248,888	3.9
Eastern	308,718	347,663	656,381	2.3
Luapula	197,001	215,797	412,798	1.9
Lusaka	355,006	338,872	693,878	6.3
Northern	319,373	358,521	677,894	2.0
North-Western	143,956	157,721	301,677	2.4
Southern	337,593	348,876	686,469	3.0
Western	222,382	265,606	487,988	1.6
Total Zambia	2,785,469	2,894,339	5,679,808	3.1

Source: Republic of Zambia, 1980 Census of Population and Housing, January 1980.

Population Distribution by Districts, 1980

<u>Province/ District</u>	<u>1980 Census</u>	<u>Average Annual Growth Rate (%) 1969-1980</u>
<u>Central Province</u>		
Kabwe Rural	142,523	1.4
Kabwe Urban	143,635	7.3
Mkushi	71,949	2.1
Mumbwa	81,976	2.9
Serenje	73,752	3.1
Total	513,835	3.3
<u>Copperbelt Province</u>		
Chitilabombwe	61,928	3.0
Chingola	145,869	3.2
Kalulushi	59,213	5.7
Kitwe	314,794	4.2
Luanshya	132,164	2.9
Mufulira	149,778	3.0

<u>Province/ District</u>	<u>1980 Census</u>	<u>Average Annual Growth Rate (%) 1969-1980</u>
<u>Copperbelt Province (cont'd)</u>		
Ndola Rural	102,703	3.3
Ndola Urban	282,439	5.3
Total	1,248,888	3.9
<u>Eastern Province</u>		
Chadiza	45,601	3.2
Chama	36,843	1.6
Chipata	203,970	2.9
Katete	93,220	1.3
Lundazi	117,961	2.3
Petauke	158,786	2.2
Total	656,381	2.3
<u>Luapula Province</u>		
Kawambwa	61,005	1.0
Mansa	110,100	2.9
Mwense	64,220	1.8
Nchelenge	76,319	2.7
Samfya	101,154	1.0
Total	412,798	1.9
<u>Lusaka Province</u>		
Luangwa (Feira)	11,474	3.4
Lusaka Rural	143,935	5.1
Lusaka Urban	538,469	6.8
Total	693,878	6.3
<u>Northern Province</u>		
Chilubi	35,660	0.9
Chinsali	67,473	1.4
Isoka	93,642	1.7
Kaputa	44,534	4.2
Kasama	148,806	3.0
Luwingu	52,070	0.9
Mbala	111,647	1.4
Mpika	81,377	2.9
Mporokoso	42,685	0.8
Total	677,894	2.0

<u>Province/ District</u>	<u>1980 Census</u>	<u>Average Annual Growth Rate (%) 1969-1980</u>
<u>North-Western Province</u>		
Chizera	12,750	2.4
Kabompo	40,992	1.9
Kasempa	29,839	2.4
Mwinilunga	67,423	2.5
Solwezi	92,380	5.2
Zambezi	58,293	-0.5
Total	301,677	2.4
<u>Southern Province</u>		
Choma	132,737	2.8
Gwembe	23,431	2.2
Kalomo	102,011	2.6
Livingstone	71,987	3.5
Mazabuka	115,384	3.4
Monze	110,650	3.1
Namwala	56,826	4.1
Siavonga	26,902	2.2
Sinazongwe	46,541	2.2
Total	686,469	3.0
<u>Western Province</u>		
Kalabo	97,933	0.4
Kaoma	70,149	3.0
Lukulu	42,996	1.1
Mongu	116,888	2.5
Senanga	101,662	1.3
Sesheke	58,360	1.6
Total	487,988	1.6
Total Zambia	5,679,808	3.1

* Includes 666 railway travellers

Source: Republic of Zambia, 1980 Census of Population and Housing, January 1981.

3.3 Urban Population

Most of the urban population is found along the railway line, in fact, over 40% of the total population live within 40 km. of the rail line. The major urban centers are the copperbelt towns, the Lusaka metropolitan area, Livingstone, and Kabwe. Of the population residing in urban areas, about 70% live in the ten cities with populations over 60,000.

Population of Large Urban Areas, 1980

<u>Large Urban Areas</u>	<u>Males</u>	<u>Females</u>	<u>Total</u>
Chililabombwe	31,873	30,055	61,928
Chingola	75,012	70,857	145,869
Kabwe	73,297	70,338	143,635
Kalulushi	30,349	28,864	59,213
Kitwe	162,792	152,002	314,794
Livingstone	36,987	35,000	71,987
Luanshya	68,651	63,513	132,164
Lusaka	276,408	262,061	538,469
Mufulira	76,967	72,811	149,778
Ndola	145,914	136,525	282,439
Total	978,250	922,026	1,900,276

Source: Republic of Zambia, 1980 Census of Population and Housing, January 1981.

Percentage Distribution of Urban Population In Provinces, 1969 and 1980

<u>Province</u>	<u>1980 Census</u>	<u>1969 Census</u>
Central	7.5	5.6
Copperbelt	47.1	62.4
Eastern	2.4	1.1
Luapula	2.7	0.6
Lusaka	23.7	23.0
Northern	4.8	1.2
Northern-Western	1.6	0.0
Southern	7.6	5.3
Western	2.6	0.8
Total Zambia	100.0	100.0

Source: Republic of Zambia, 1980 Census of Population and Housing, January 1981.

3.4 Ethnic Groups

There are 73 officially recognized ethnic groups, however, none is politically or economically predominant. Three of the more important groups are described below.

Bemba - Although Bemba is the most widely spoken native language, the Bemba people constitute only about 19% of the total population. Traditionally the Bemba were agriculturalists in northeastern Zambia. More recently, wage opportunities in the mines have resulted in large-scale migrations of Bemba men to the copperbelt. The lack of male labor has caused agricultural production to decline in many rural areas.

Nyanja - Originally from eastern Zambia, the Nyanja have become closely identified with Lusaka (as well as the government bureaucracy, and the army) where Nyanja is the lingua franca.

Tonga - The Tonga are sedentary farmers located primarily along the rail line. Both commercial and subsistence agriculture are practiced.

4. Health, Nutrition, and Housing

4.1 Vital Statistics

Crude birth rate	50.0 per 1,000 population
Crude death rate	19.0 per 1,000 population
Natural rate of increase	3.1 per 100 population
Life expectancy at birth (males)	44.3 years
Life expectancy at birth (females)	47.5 years
Infant mortality rate	127 per 1,000 live births
General fertility	220.9 per 1,000 women

Source: World Bank, Zambia Country Economic Memorandum, 1981.

4.2 Diseases

Malaria is endemic in rural areas while control measures have reduced the incidence in urban areas. Transmission is highest between November and May. Schistosomiasis is widespread, especially in irrigated areas. Trypanosomiasis occurs both in humans and cattle. However, the presence of the tsetse fly is more of an economic than a medical problem in that it reduces land available for cattle raising. The number of lepers in sanatoriums has declined with the development of out-patient services for non-infectious cases.

Other common diseases include tuberculosis, measles, and poliomyelitis (all prevalent despite inoculation efforts). Respiratory diseases (pneumonia, bronchitis, influenza) account for the largest number of hospital admissions, followed by accidents and injuries (Zambia has a very high rate of traffic accidents), and gastroenteric diseases. Bacillary and amoebic dysentery are responsible for a large number of infant illnesses and deaths. No smallpox or yellow fever reported since the early 1970's. A cholera outbreak in the northern districts of eastern Zambia in 1978 resulted in the establishment of a cholera surveillance system.

4.3 Health Facilities and Services

The Ministry of Health (MOH) has three administrative components: the Central Administration, Provincial Administration, and District Coordinating Committees. The Central Administration is responsible for

formulating health policy and allocating funds. The Provincial and District Administrations, as their names suggest, deal with health matters on a local level.

There are three government-run central hospitals in Lusaka, Kitwe, and Ndola. These provide the widest range of specialist services available in the country. In addition there are three special hospitals; the Liteta Hospital for leprosy patients, Chainama Hills for mental patients, and the Arthur Davison Hospital for Children. Nine general hospitals are located in the provincial capitals and at district headquarters in Choma and Mbala. (There is no general hospital in Copperbelt Province because that province has two central hospitals.) General hospitals are headed by a medical superintendent and staffed by specialists and general medical officers offering major surgery and other speciality services. At the local level there are 30 district hospitals, located in district headquarters, which serve as referral centers for smaller facilities in the district. (Private missions run nine of these.) There are also 34 other hospitals (4 GRZ-run, 19 mission-sponsored, and 11 operated by mining companies) and 17 leprosaria.

The basic health facility in rural Zambia is the health center. There are two types of Rural Health Centers (RHC): a sub-center containing 2-4 beds and serving a population of 5,000-10,000 people, and a larger facility (16+ beds) serving from 30,000-40,000 people. The RHC's are responsible for all essential curative and preventive services including immunization, nutrition, and maternal/child health (MCH). Ideally centers are staffed by medical assistants, nurses, midwives, and health assistants; however, many facilities lack the minimum staff needed to operate effectively.

Over 1,000 MCH clinics now operate from established rural health centers or are run by visiting health staff. Immunization, nutrition and health education, and distribution of food supplements are the principal activities of these clinics. In 1973 the school health service which provides screening and health education for pupils and teachers was incorporated into the MCH program.

Medical Facilities, 1975

	<u>Hospitals</u>	<u>RHC's</u>	<u>Clinics</u>
Government	39	404	141
Mission	29	74	15
Mining Co.	11	n.a.	n.a.
Total	79	478	192
No. Beds	14,980	(4,990)	

No. Beds per 1,000 population: 3.1

Source: USAID, Health and Development in Southern Africa, Vol. II, 1978.

4.4 Medical Supplies

Almost all medical and surgical supplies are imported, as are over 90% of the pharmaceutical products. Shortages of essential drugs are common, especially in small facilities. In 1978 a drug compounding plant in Lusaka was being expanded and an intravenous fluids plant was being constructed.

4.5 Medical Personnel

The number of health professionals has more than doubled since independence but there is still a large demand for all types of health workers. The major issues affecting health manpower are the overall shortage of trained personnel, a low percentage of Zambians in senior positions (less than 10% of doctors and RN's are Zambian), and the uneven distribution of health manpower. The ratio of physicians to the total population is about 1/8,000. In rural areas where 60% of the population lives, the ratio is 1/41,000. The distribution of nurses is equally skewed in favor of urban areas with over 70% of nurses working in urban settings. Overall nurse/population ratio is one to 1,200.

The GRZ also operates a Flying Doctor Service (FDS) which services remote rural areas. The FDS maintains 16 airstrips and has responsibility for staffing and servicing 15 FDS clinics. Eleven other GRZ or mission clinics are served regularly by FDS flights. In 1978 the FDS had six physicians, 10 nurses, and one nutritionist. The service operates with four twin-engined planes and is on-call 24 hours a day.

There are a large number of traditional healers in Zambia, including herbalists, diviners, and spiritualists or fetish priests. Estimates of the number of traditional practitioners range from 2,500-5,000.

Health Personnel in Zambia, 1975 and 1977

<u>Category</u>	<u>Public and Private, 1975</u>		<u>Government,</u>
	<u>Total</u>	<u>% Zambians</u>	<u>Mission and</u> <u>Mine, 1977</u>
Physicians	643*	10%	596
Dentists	28	11%	17
Pharmacists	126	7%	40
Nurse Educators	19	16%	32
Midwifery Tutors	-	-	10
Nurse Administrators	36	47%	40
Public Health Nurses	-	-	10
Registered Nurse/Midwives	905	48%	1,740
Enrolled Nurse/Midwives	1,530	100%	2,540
Medical Assistants	980	82%	1,030
Health Inspectors	91	80%	115
Health Assistants	219	100%	415
Physiotherapists	16	19%	23
Laboratory Technicians	70	29%	132
Laboratory Assistants	60	100%	83
Radiographers	40	50%	72
X-Ray Assistants	40*	-	58
Dental Technicians	45*	-	10
Dental Assistants	18	100%	26
Health Aides (Dressers)	880	100%	900**
Totals	5,746		7,889

* Figures for 1977 (includes estimate of 50 doctors in private practice)

** Estimate

Source: USAID, Health and Development in Southern Africa, Vol. II, 1978.

4.6 Diet

Over 80% of the average Zambian's caloric intake comes from cereal and root crops. Maize is the main staple food everywhere, except in certain northern and central areas where millet and sorghum are preferred. Cassava is important as a staple or supplement in all parts of the country. In addition, rice is increasingly popular, especially in urban areas. Vegetable consumption is high throughout the country, but consumption of fruit tends to be low, except in the eastern provinces. Consumption of eggs, milk, fats, and oils is also low except in Western Province where cattle are the basis of the local economy. Fish constitutes a major

source of protein (over 50% of consumed protein) and is much more important than meat in the diet.

Information collected in 1970-71 through a UNDP and FAO-sponsored nutrition survey project (National Food and Nutrition Programme: Zambia) found the average calorie intake to be about 1,720 per capita, per day. This ranged from a high of 1,950 in the copperbelt to a low of 1,580 in Northwestern Province. Using an average per capita daily requirement of 2,050 calories, the survey concluded that there was an overall calorie deficit of about 20%.

Average Annual Food Intake Per Capita By Province (kg)

	<u>North- ern</u>	<u>East- ern</u>	<u>cen- tral</u>	<u>Copper- belt</u>	<u>North- Western</u>	<u>West- ern</u>	<u>South ern</u>
Staples	176.5	126.4	169.6	138.6	209.0	210.9	151.6
Maize	25.6	121.7	143.9	92.0	53.1	107.9	137.0
Finger Millet	38.1	2.4	3.8	-	4.5	-	-
Sorghum	0.6	1.2	10.6	34.8	41.7	19.8	13.9
Rice	0.7	0.6	0.4	0.1	0.7	0.3	-
Cassava	111.5	0.5	10.9	11.6	109.9	82.9	0.8
Other Roots	3.9	-	1.9	0.8	17.4	8.5	3.2
Sugar	0.4	0.6	1.2	0.4	1.3	2.3	1.3
Pulses	7.2	1.2	1.5	0.5	3.7	0.5	0.8
Groundnuts	3.3	5.9	1.3	0.7	1.8	1.3	10.8
Vegetables	28.0	28.4	27.6	46.8	41.9	28.1	62.7
Fruits	2.0	35.4	4.0	2.8	3.9	10.3	6.1
Meat (fresh)	9.8	22.0	13.8	4.2	22.8	18.5	23.3
Domesticated	2.9	13.7	6.4	3.2	7.4	18.5	21.5
Other	6.9	8.3	7.4	1.0	15.4	-	1.7
Eggs	0.1	0.1	0.5	0.3	0.1	0.1	0.1
Milk	0.3	1.3	4.6	-	0.4	9.5	3.5
Fish (fresh)	34.3	11.4	36.0	32.4	21.3	50.3	9.4
Fats & Oils	0.4	0.5	0.8	3.1	0.6	0.1	0.1

Source: USAID, Health and Development in Southern Africa, Vol.11, 1978.

4.7 Staple Foods

Cereals - white varieties of maize are preferred, generally ground into meal (though fresh maize is eaten as a vegetable in many places);

millet; sorghum; rice; bread products from wheat flour are increasingly popular.

Roots - cassava is consumed in the form of starch from roots and as a leaf salad.

Vegetables - legumes (beans and peas), pumpkin, and green leaves are usually eaten with the staple food as a sauce or side dish.

Oils/Fats - groundnut oil is used for cooking; animal fat in cattle raising areas.

Fish/Meat - fish, both dried and fresh, is the main source of protein; meat and poultry are eaten only occasionally.

4.8 Nutritional Deficiencies

Malnutrition, though declining in incidence, is still a significant health problem, especially among infants, children, and pregnant women. The main disorders relating to nutrition are protein-calorie malnutrition, iron-deficiency anemia, and avitaminosis. Malaria and other parasitic diseases that cause intestinal disorders contribute to malnutrition particularly in children. Marasmus (calorie deficiency) is more prevalent than kwashiorkor (protein deficiency); however, severe malnutrition is uncommon.

4.9 Acceptable Alternatives

Wheat flour; yellow maize may give some problems.

4.10 Housing

The main factor affecting the housing sector has been the high rural to urban migration which has placed great pressure on the urban housing market. The consequences of rapid urbanization are most apparent in Lusaka and Kabwe where squatters (mainly recent migrants) make up over 40% of the total population. It was estimated that close to one million people lived in squatters areas in 1980, and only a small fraction were reached by essential services.

Urban

Dwelling construction ranges from makeshift shanties to large brick and tile homes of the wealthy. Low to medium cost housing has walls of sun- or kiln-dried bricks or concrete blocks and roofs of asbestos or corrugated iron. Among poorer households, average occupancy per dwelling unit is six to eight persons. In 1974 18.5% of urban households lacked adequate access to potable water and 11% lacked adequate sewage disposal.

The GRZ has made efforts to alleviate the urban housing shortage in two ways: by providing site-and-service plots to self-help builders and by upgrading and supplying essential services to existing squatter settlements. In the first instance emphasis is put on self-help. Local authorities layout and service plots of land which are then leased to families who construct their own houses with the assistance of technical advice and loans from the government. In the second case, the GRZ is attempting to raise the standard of living in existing squatter settlements by upgrading the units and providing water, sewers, roads, and electricity. The GRZ has also continued to build low-cost rental units in both urban and rural areas.

Rural

Traditional farm families generally have very poor living conditions. Houses are often dilapidated, lacking adequate roofs and walls; poles, grasses and mud are the usual building materials. Houses are spread out and separate buildings have distinct functions, such as for sleeping, cooking, and storage. In 1974 13% of rural households used tap water, 43% had access to a well or borehole, and the remainder had to seek water from a river or stream. In the same year, 62% of the rural households had no sanitation facilities, and 38% had pit latrines.

5. Agriculture

5.1 Overview of Agriculture

Although agriculture employs approximately 60% of the population, its contribution to GDP has only been 13-14% since independence. Real value added in the sector has grown at an average annual rate of 1.5% (1970-79) which, though faster than overall GDP growth, was disappointing when compared to the sector's potential. 1979 and 1980 were very poor years, due mainly to drought and problems with the distribution of fertilizer and agricultural credit. Agriculture's poor performance has increased rural to urban migration, creating a manpower shortage in rural areas and adding to crowding and unemployment in urban centers.

Maize is the most important crop, constituting 60-70% of the value of all marketed crops. Other significant products are groundnuts, cotton, tobacco, sugar, sunflower seeds, cattle and pigs. Soybeans, wheat, rice, coffee, and tea are expected to become more important in the near future. In May 1980 President Kaunda inaugurated "Operation Food Production," a massive program aimed at eliminating food shortages by 1990. The main points of the program include:

- establishment of government-run state farms in each of the nine provinces.
- rejuvenation of the country's cooperative system, including state farms and rural reconstruction and producer cooperatives.
- expansion of Zambia National Service Farms, Rural Reconstruction Centers, and the agricultural extension service.
- institution of incentives for agricultural producers.

The program is to cost over K400 million over a 10 year period with external aid expected to provide most of the foreign exchange costs.

5.2 Current Status

The food situation remains serious in western Zambia and large cereal import requirements (resulting from the 1979 and 1980 droughts) have not been met. Due to foreign exchange difficulties, commercial cereal imports were less than hoped for in 1981. In addition, a railway congestion in Zimbabwe delayed distribution of available food.

The outlook for the 1981 maize crop (harvested in June through September) in the rest of the country is favorable. Rainfall in both November and January-February was above normal in the main maize growing areas, and an increase in producer prices last August should have resulted in more plantings. According to the most recent GRZ estimates, maize production in 1981 is about 70% more than in the past two years.

5.3 Land Use

The most widely practiced form of cultivation (over two-fifths of the country) is a slash-and-burn technique known as citemene (derived from the Bemba word meaning "to cut"). The aim of citemene cultivation is to increase soil fertility using ash as a fertilizer. Every several years the land is abandoned to regenerate and the community moves to a new area. Semi-permanent hoe and ox-plow cultivation is practiced in about a quarter of the country, including all of Western and part of North-Western provinces and on the Zambezi Escarpment. Cattle raising is widespread in these areas and seasonal migrations occur in the dry period from about June to December. Semi-permanent cultivation is also practiced in the generally fertile Luangwa River Valley. The presence of tsetse fly in the entire river valley prevents cattle raising.

Although fishing is the major economic activity around the lakes and swamps, some cultivation is also practiced. Cassava, which requires little attention, is the principal staple, along with some maize and peanuts. Zambia's best soils are found along the rail line stretching from Livingstone to the copperbelt, and in the area of Petauke and Chipata in Eastern Province. Most commercial farming is carried out on State lands in these areas.

5.4 Crop Production

Maize, cassava, sorghum, finger and bulrush millet, peanuts, and beans are the principal staples grown in Zambia. Maize is the dominant staple and major subsistence and cash crop. It is grown to some extent throughout the country, though most marketed maize comes from Central and Southern Provinces. Maize is also used as a feed for livestock and poultry. Cassava is a major crop among the fishing populations around the lakes, along the northern border with Zaire, and in the far west. Peanuts are grown throughout the country primarily as a subsistence crop. Total production in the late 1970's did not meet domestic requirements for processing into

oil, and large amounts of peanuts had to be imported. Since then the GOZ has raised the purchase price significantly, creating an incentive for increased production.

Zambia is currently self-sufficient in sugar production, though increasing demand may change this situation. Bread and other products made from wheat have been increasing in popularity, especially in urban areas. In the late 1970's domestic production of wheat was only a fraction of the requirement necessitating massive imports. However, recent GOZ support has boosted wheat production and it is hoped that the country will be self-sufficient in wheat within 15 to 20 years. Tea and coffee have also received recent government attention in an effort to increase production.

Major cash crops are cotton, grown mainly on the plateau areas of Central, Eastern, and Southern provinces and to some extent in the Luangwa River Valley. Tobacco is the most important agricultural export.

5.5 Crop Dates

<u>Commodity</u>	<u>Planting season</u>	<u>Harvest season</u>
Beverages:		
Coffee	March	September - October
Cereals and grains:		
Barley	May	September - October
Corn	November - December	April - June
Millet	November - December	April - June
Oats	November - December	April - June
Rice	October - November	April
Wheat (Kafue Flats)	April - May	October - November
Fibers:		
Cotton	October - November	April - May
Fruits	February or July	March - May
Oilseeds:		
Peanuts	November - December	March
Sugarcane	December - January	May - June

<u>Commodity</u>	<u>Planting season</u>	<u>Harvest season</u>
Tobacco:		
Various varieties: (Mainly flue-cured)	October - December	January - April
Turkish	February	March - July
Vegetables:		
Beans	January - February	April
Cassava (manioc)	September - December	December - March
Peas	January	April
Potatoes	November - January	June - July

* Harvested from 12 to 18 months after planting.

5.6 Storage Facilities

NAMBoard Grain Storage Capacity, 1974/75 (in 1,000 90 kg. bags)

<u>Depots</u>	<u>Silos</u>	<u>Covered Sheds 1/</u>	<u>Open Hard Standing</u>	<u>Total</u>
Permanent Depots				
Kitwe	160	-	-	160
Bwana Mkubwa	250	225	560	1,025
Kabwe/Natuseko	250	150	475	875
Chisamba	250	120	582	952
Lusaka	160	300	803	1,263
Mazabuka	-	80	226	306
Monze	160	195	508	863
Pemba	-	30	175	205
Choma	-	23	496	519
Livingstone	-	40	621	661
Chambishi	-	-	600	600
Sub-total	1,230 2/	1,163	5,046	7,439
Rural Depots				
Mkushi	-	-	120	120
Mumbwa	-	-	60	60
Chipata	-	-	100	100
Luapula Province	-	-	122	122
North Western	-	60	40	100
Western Province	-	66	117	183
Sub-total	-	126	559	685

<u>Depots</u>	<u>Silos</u>	<u>Covered Sheds 1/</u>	<u>Open Hard Standing</u>	<u>Total</u>
Transit Depots				
Chipongwe	-	-	20	20
Karubwe	-	-	345	345
Kasavasa	-	-	140	140
Chankwakwa	-	-	50	50
Kapiri Mposhi	-	40	358	398
Senkobo	-	-	20	20
Mayoba	-	-	20	20
Bowood	-	-	30	30
Kalomo	-	-	50	50
Tambero	-	-	20	20
Nega Nega	-	-	40	40
Kaleya	-	-	250	250
Lubombo	-	-	107	107
Tara	-	-	50	50
Sub-total	-	40	1,500	1,540
Total	1,230	1,329	7,105	9,664

1/ All covered sheds in the permanent depots are being used to store fertilizer, seeds and other chemicals. Thus the total silo and covered shed capability for maize is about 2 million bags.

2/ Includes 750,000 bag silo capacity built by ZCCO.

Source: NAMBoard. Data provided by the USAID Mission in Lusaka.

5.7 Livestock

Cattle raising is restricted to areas that are free of the tsetse fly. The largest number of cattle are found along the rail line. About 40% of the national herd is located in the south and another 15-20% is in the central line-of-rail zone. Most commercial producers of beef and dairy products are located in these areas. Livestock grazing is also a major occupation in the tsetse-free areas of western Zambia, where about 25% of the national herd is found. Because of the tsetse fly, cattle raising is very limited in the eastern portions of the country. Only along the Tanzanian border and in small areas of Eastern Province is livestock herding possible.

5.8 Veterinary Services

The Department of Veterinary and Tsetse Control Services is the government agency responsible for controlling animal diseases. In the late 1960's a spraying campaign cleared the tsetse fly from large areas of Eastern and Southern provinces (though large tracts of land are still infested). Trypanosomiasis in cattle is dealt with by curative and preventive injections of drugs. Contagious bovine pleuropneumonia, a disease occurring mainly in the Western Province, has been successfully controlled, and eradicated completely from the west bank of the Zambezi River. Routine vaccinations against anthrax, quarter evil, and malignant oedema has prevented outbreaks of these diseases. Preventive measures for poultry has protected against threats such as Newcastle disease.

5.9 Agricultural Exports

Tobacco and occasionally peanuts, sugar, and maize are exported but their share of export earnings rarely exceeds 1% of the total.

5.10 Agricultural Imports

Imports of edible foods and fats have cost about K40 million annually in recent years or from 6-10% of total visible imports, and about 40% of the value of all formally marketed crops. Most years the imports of wheat, dairy products, and edible fats have accounted for about 80% of the value of all agricultural imports. However, in 1979 the drastic decline in maize production (marketed maize fell by 50%) caused maize imports costing approximately K60 million. This was followed by an equally bad 1980 crop which necessitated over K100 million in maize imports.

6. Economy6.1 Overview of Economy

Real GDP grew at an average rate of 2.3% from 1965 (Independence achieved October 1964) to 1974. Since 1974 growth in GDP has been nil and growth in domestic income has been negative. With the population growing at over 3.0% (1970-78) per annum, per capita income has been steadily declining; current GDP per capita is less than 60% of the 1965 level.

Events during the 1970's have served to highlight Zambia's economic and political vulnerability. Political and military ventures in Angola, Zaïre, and Zimbabwe have been costly both by increasing Zambia's need for defense expenditures and by disrupting trade patterns and access routes to the sea. Fluctuations in copper prices and output have added to the unstable economic situation. A 40% drop in copper prices (1974-75) was followed, when prices recovered, by a significant decline in output. In addition, both the manufacturing and service sectors have been adversely affected by the stagnation of mining activities. Sectoral shares in GDP in 1978: agriculture 12%, mining 33%, manufacturing 10%, construction 9%, transport and communications 3%, and services 32%.

Real GDP by Type of Economic Activity 1974-78
(in 1970 kwacha millions)*

	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	Average Annual % Change <u>74-78</u>
Gross domestic product	1,464	1,434	1,549	1,485	1,480	0.3
Agriculture, forestry and fishing	150	157	167	168	172	3.5
Mining and quarrying	474	430	503	474	484	0.5
Manufacturing	178	158	152	141	150	-4.4
Construction	114	140	158	154	133	3.9
Transport, communication and storage	54	60	67	62	60	2.7
Services and other	493	492	502	485	482	-0.6

* Prior to February 1973, K1 = US\$1.40

Source: World Bank, Zambia Country Economic Memorandum, 1981.

6.2 Manufacturing Sector

The manufacturing sector was hard hit by the economic crisis which began in 1974-75. Real growth declined through 1977, increased somewhat in 1978 and 1979, but is still below 1974 levels. The fastest growing industries have been printing and publishing, wearing apparel, and chemical, petroleum, and plastic products. Slow or no growth occurred in metals, machinery, and equipment (due to stagnation in the mining and construction sectors) as well as in wood and non-metallic mineral products. The manufacturing sector is primarily engaged in processing intermediate goods and raw materials for the domestic market; 47% of the sector is involved in food, beverage, and tobacco processing.

6.3 Mining

The copperbelt is an area about 110 km. long by 50 km. wide along the border with Zaire and adjoining the industrialized mining area of Zaire's Shaba Province. There are ten producing mines with reserves of over 882 million tons of copper or 1/8th of the world's exploitable reserves (Zambia is the third largest producer of copper in the world). Though copper is the most important mineral mined in Zambia, there is also significant production of zinc, lead, cobalt, coal, and numerous other industrial minerals. Over the period from 1965 to 1975 mining accounted, on the average, for 35% of the GDP, 95% of export earnings, and 45% of government revenue. However, in late 1974 and 1975 a sharp decline in world copper prices altered the situation considerably. By 1977 mining's contribution to the GDP dropped to 12.6% and the sector no longer produced any government revenue (mining's share of exports continued high at 97% of the total).

6.4 Exports

Copper dominates Zambia's export trade; however, with the recent stagnation of copper production and sales, the country has become increasingly vulnerable to fluctuations in world copper prices. Small amounts (by value) of zinc, lead, maize, and tobacco are also exported. The price of cobalt jumped in 1978 and 1979, resulting in increased investment by mining companies. It is expected that the impact of these investments (beginning in 1980) will partially offset the decline in copper exports. The main destination for Zambia's exports are Japan, Great Britain, West Germany, and China.

6.5 Imports

Principal imports are machinery and transport equipment, manufactured goods, electricity, and mineral fuels and chemicals. Increased domestic production of beverages, tobacco products, electricity, and coal have resulted in a proportional decline in imports of these items. Only chemicals have recorded significant growth, from 7.3% of total imports during 1966-70 to 11.1% during 1971-75. Major suppliers are Great Britain, South Africa, the EEC, the US, and Japan.

7. Transportation and Logistics

7.1 Overview of Transportation

The present transport network comprises approximately 35,000 km. of roads, 2,000 km. of railways, 150 airports, and a 1,700 km. oil pipeline from Dar es Salaam to Ndola (see Petroleum, section 8.2). The road system was developed as an adjunct to the rail system which runs approximately north-south. The bulk of Zambia's external trade traditionally has been carried by rail to the west through Angola, to the east through Tanzania, or to the south through Zimbabwe and on to ports in Mozambique or South Africa. In the 1970's political tensions in the region resulted in increased reliance on road routes through Tanzania and Malawi.

According to a recent World Bank evaluation, the transport system has sufficient extra carrying capacity such that if one major route was closed for political or technical reasons, a shift to other routes would be possible. However, a continuing problem is the large difference between potential and actual carrying capacity. Issues to be addressed include management planning, technical problems, and the need for long-term maintenance and rebuilding programs.

7.2 Road Network

Of the approximately 35,000 km. of roads, over 5,000 km. are paved, 7,500 km. are gravel, and 23,500 km. are unimproved roads or earthen tracks. After Rhodesia declared Unilateral Declaration of Independence (UDI) in 1965, Zambia began a major effort to upgrade its internal road network and improve links to other countries. Aided by international assistance, both the 820 km. Great Northern Road running from Kapiri Mposhi to the Tanzanian border and the 635 km. Great Eastern Road running from Lusaka to Chipata were upgraded and asphalted. Asphaltting of the 550 km. road from Lusaka to Mongu, capital of Western Province, was completed in 1973 and the road from Livingstone to Sesheke was also paved. By 1979 a program of paving and improving the roads between Lusaka and the eight provincial capitals had been completed.

Major Routes

Great Northern Road or TANZAM Highway - connects in the south with Zimbabwe and in the northeast with Tanzania. The road runs 473 km. from Livingstone to Lusaka and then 1,886 km. from Lusaka to Dar es Salaam. Entirely paved.

Great Eastern Road - opened in 1966/67, this route runs 635 km. from Lusaka to the border with Malawi. A lack of proper maintenance has caused surface deterioration, especially along the shoulders.

Katete-Cassacatiza-Moatize Road - gravel road branching off from the Great Eastern Road at Katete, running to the Mozambique border at Cassacatiza, and linking with the railhead at Moatize. This road is a dry weather road only. In addition, curvature and grade problems exist. Storage facilities exist at Moatize, but no information about their capacity is currently available.

7.3 Vehicles

In 1978 the government had approximately 12,570 vehicles in its fleet. However, due to a shortage of spare parts and infrequent maintenance, a large number of these vehicles are always in the shop awaiting repairs. Private truck operators account for much of the road haulage, but rates are influenced by the parastatal agency, the National Transport Corporation.

National Transport Corporation of Zambia: P.O.B. 2607, Lusaka; state-owned freight and passenger transport service.

Zambia-Tanzania Road Services: P.O.B. 2581, Lusaka; over 1,000 trucks operating between Dar es Salaam, Tunduma (Tanzanian border), the Copperbelt, and Lusaka.

7.4 Surface Miles *

Belra								
570	Bulawayo							
909	548	Johannesburg						
887	803	1,256	Kitwe					
860	290	838	513	Livingstone				
640	556	1,009	247	266	Lusaka			
837	753	1,206	37	463	197	Ndola		
348	269	717	539	559	292	489	Salisbury	
1,261	1,188	1,641	596	898	632	567	924	Tunduma

* 1 mile = 1.6 kilometers

7.5 Railway Network

The rail system consists of two main lines of 1.067 - meter gauge (standard throughout southern Africa) totalling about 1,962 km. The main trunkline running from Livingstone to the copperbelt passes through the most developed and densely populated sections of Zambia. Almost all of the major urban centers are situated on the rail line. This main rail segment totals nearly 1,100 km., including numerous spurs in the copperbelt serving various mining centers, a branch from Livingstone northward to forest logging areas around Mulobezi and Kataba, and a spur to serve the Maamba coal mine. In the north this line connects with the rail system of Zaire and through that to the Benguela railroad in Angola which runs to the Atlantic Ocean. The southern terminus at Livingstone connects by bridge across the Zambezi River to the rail system of Zimbabwe, Mozambique, and South Africa and provides access to the ports of Beira and Maputo in Mozambique and East London and other ports in South Africa (see Ports, section 7.5).

The second major line, the Tanzania-Zambia Railway, known as the TAZARA line, runs approximately 860 km. from Kapiri Mposhi to Tunduma on the Tanzanian border. From there the line continues through Tanzania for another 1,000 km. to Dar es Salaam. The track is 1.067 meter gauge allowing connection with the rail system in Zambia as well as in the ports of Central and Southern Africa. However, it is not compatible with the rail systems of Tanzania and East Africa.

The two systems are operated separately: the Livingstone-Copperbelt line is owned by Zambia Railways; the TAZARA line is owned equally by the Zambian and Tanzanian governments and is operated by the Tanzania-Zambia Railway Authority (TAZARA) headquartered in Lusaka.

7.6 Ports

Zambia's access to the sea is dependent upon cooperating agreements with neighboring countries. Throughout the 1970's, civil strife in Angola, Mozambique, and Rhodesia closed Zambia's traditional trade routes at one time or another.

Beira

Coordinates: Lat. 19° 49' S.; long. 34° 50' E. Chief port of entry for Malawi and Zambia; also serving Zaire.

Authority: Caminho de Ferro de Mozambique.

Approach: At mouths of Pungue and Buzi Rivers, a tidal port with a range of tides of 6.22 to 7.35 m. at HWST and 4.01 to 4.48 m. at HWST. Max. draft for turning ships round at or off wharf is 9.14 m. Max. draft permissible at any time of the year, 10.06 m. to 10.97 m. ST and 8.23 to 9.84 m. NT. Only vessels with draft up to 4.88 m. may enter at any time of the tide. Vessels may be requested to anchor at the bar if neither wharf nor buoy is immediately available. Tankers always wait at the bar if berth is not available. Vessels with draft not exceeding 7.92 m. may remain at anchor during ST. On NT vessels with draft up to 9.14 m. can remain. The inner anchorage is limited to a max. of four vessels at any one time.

Wharves are located 17.6 km. up stream from Pilot Cutter and are reached through suitably dredged and buoyed Macuti Channel. Firm holding grounds in outer anchorage, and small vessels may anchor inside port.

Accommodation: Pungue Wharf Accommodation.

<u>Berth No.</u>	<u>Max. Depth. (m.)</u>	<u>Length (m.)</u>	<u>Electric Cranes (tons)</u>
No. 1	8.53	176.77	2 at 6
No. 2	8.84	161.53	2 at 6 4 at 3
No. 3	8.84	161.53	3 at 6 3 at 3
No. 4	9.14	161.53	2 at 6 3 at 3
No. 5	9.14	161.53	2 at 3.5 1 at 5 1 at 3
No. 6	9.75	164.58	1 at 10 5 at 5
No. 7	9.75	164.58	1 at 10 5 at 5
No. 8	9.14	192.0	—
No. 9	9.14	167.63	1 at 10 5 at 5
No. 10	9.45	167.63	1 at 20 5 at 5

Storage:	There are 12 sheds for general cargo of 32,260 sq. m. overall. Large open dump spaces are available.
Cranes:	One electric crane and one mobile diesel crane available. Forklift trucks are available.
Provisions:	Not available.
Water:	In plentiful supply.
Container Handling Facilities:	Available at No. 10 berth, with a 20-ton shore crane; only crane; only suitable for empty containers.
Tanker Terminals:	No. 10 berth is fitted with two 10 in pipelines for the discharge of oil to installations. There is also a 22-in. discharge line for crude oils. A pipeline connects the port with a refinery in Feruka (Zimbabwe). It is over 320 km. long and has an annual capacity of 660,600 tons (not in operation at present).
Bunkers:	No coal. Bunker oil fuel from all wharves. Fresh water available from all Punge Wharf berths by hose.
Development:	Berth 10 to be converted for container and Ro/Ro traffic handling with stacking facilities behind the wharf apron and sheds.
Shiprepairs:	Minor repairs by Beira Engineering Co. Ltd. and Davidson & Broadfoot (Succrs) Ltd. A 115 m. drylock is available with a maximum width of 16.76 m. Diving services.
Charges:	On application.
Towage:	Available.
Pilotage:	Compulsory.
Airport:	Manga, 12.8 km.

Dar es Salaam

Coordinates: Lat. 6° 50' S.; long. 39°17' E. Local time: G.M.T.+3 hours.

The entrance channel is about 2 km. in length from its outer entrance between the edges of the banks fronting North and South reefs, to the harbor entrance S. of West Ferry point; its width varies from about 277 m. to about 92.5 m. at its narrowest part between East and West Ferry Points. Minimum depth is 7.31 m. at L.W.O.S.T., minimum width 128 m. In Inner Harbor, port working is unaffected by weather. Owing to the sharp bends in the channel, no attempt should be made to negotiate the passage in a single screw vessel more than 175.2 m. long without the permission of the port management.

Eleven deep water berths, total length approx. 2,000 m.; dredged depth 10 m. Lighterage quays, total length 588 m., 167 forklift trucks, 56 tractors, pallets, 3 berthing and 8 towing tugs, 41 lighters, 2 pilot boats, 10 labor launches, pontoons, etc.

Storage: Two main quay transit sheds, 11,706 sq. m. and 16,898 sq. m. respectively; two transit sheds at the back of the port totalling 16,695 sq. m.; passenger sheds, baggage halls, customs warehouse and transit depots, etc. Stacking grounds of 93,000 sq. m. at the main port and 20,539 sq. m. at Ubungo.

Cranes: 30 electric level luffing cranes of 3/20 tons capacity; 33 mobile cranes of 4/30 tons capacity; one (unreliable) 60-ton capacity floating crane.

Tanker
Terminals: "T"-shaped jetty, starboard side 9.8 m. deep, for vessels up to 183 m. length; single buoy mooring for vessels up to 100,00 dwt.

Bunkers: Fresh water is available at deep water berths and may be supplied to ships at anchorage in limited amounts. All water is chlorinated but should be boiled and filtered. Oil bunkering is not general but available. Provisions available. Fresh vegetables limited.

Shiprepairs: Small 100-ton capacity slipway, depth 1.83 m. L.W.O.S.T., owned by East African Harbours Corporation.

Towage: Tugs available; rates on application.

Pilotage: Compulsory.

Local
Holidays: Christmas Day and May Day (International Worker's Day) are the only holidays on which the harbor is normally closed except for mailships, passenger and baggage, livestock, and perishables.

Working Hours: 0800 to 1630; meal 1230 to 1400. Saturday 0800 to 1230.

Durban

Coordinates: Lat. 29° 53' S.; long. 31° 4' E. Natal Province, on the SE coast. South Africa's premier port and the largest harbor on the African continent.

Authority: South African Railways & Harbors Administration, Port P.O. Box 38006, Point, Durban. Tel: 4069.

Weather: Prevailing winds SW and NE.

Tides: Lowest 0.09 m. below chart datum; highest 2.22 m. below chart datum.

Largest
Vessel: Record handled 14.5 m. draft. Usual limit, 243.8 m. long, 12.19 m. draft.

Accommodation: Depth at entrance, outer and inner channels, 12.8 m. LWOSt R of T 1.83 m. springs, 1 m. neaps. Max permissible length 244 m. Depth alongside wharves, max. 12.8 m.; min. 6 m. LWOSt. Wharves: Point T and T. Jetty, 3,698 m. for commercial shipping; Maydon Wharf 2,811 m.; Pier No. 1, 1,714 m.; Bluff Coaling Berths 743 m. Point Maydon Wharf and Pier No. 1 quays have shed accommodation of 101,219 sq. m. or a capacity of 347,073 cubic m. (based on a stacking height of 3.43 m).

A seven-berth deep-water pier at Salisbury Island. The pier has four cargo sheds and each berth is equipped with four 4-ton and two 7 1/2-ton cranes. Four berths together with two cargo sheds are available. Adjacent to Pier No. 1, an additional deepwater quay (Cross Berth), 545 m. in extent, available.

Cranes: 155 by 4 ton wharf cranes, 16 by 7 1/2 ton, eight by 15 ton, one 81 ton; 13 mobile cranes with lifting capacities ranging from 15 to 35 ton and two with a lifting capacity of up to 6 ton; four 12.5 ton capacity. One heavy lift wharf crane of 80 ton; three floating cranes, one of 25 ton, one of 60 ton, and one of 200 ton. Sixteen 30 ton straddle container carriers. Two 30-ton container cranes, two more being built.

Provisions: Available.

Water: Fresh water is available at all berths.

**Container and
Ro/Ro Handling
Facilities:**

Five deep sea common-user container berths have been built, and two coastal container berths.

Seven ship-to-shore container cranes with a capacity of 40 tons under the spreader. Max draft alongside 12.2 m.

Terminal facilities: a back-up area of approximately 120 ha. provides for adequate staking areas. Equipment to be provided includes 34 straddle carriers, fork-lift trucks as well as internal haulers and semi-trailers.

The rail terminal for forwarding or receiving containers to or from inland destinations will be situated in the terminal. It will be equipped with two rail-mounted electric gantry cranes for the rapid transfer of containers from rail wagons to road vehicles, and vice-versa.

Bulk Cargo**Handling****Facilities:**

Grain elevator at Berth No. 8 Maydon Wharf capable of shipping 1,422 tons of grain products per hour; storage capacity 38,100 tons. Max draft 9.75 m. Quayside pre-cooling stores with total capacity of 7,466 shipping tons. Privately owned conveyor plants at Maydon Wharf and Island View ship pelletised grain products at 350 ton/hr. and 230 ton/hr. respectively.

Multi-purpose bulk installation at Berth No. 5 Maydon Wharf. Length of berth 189 m., 10.2 LWOST. Tides: ST 10.2 m. LW, 12 m. HW; NT 11.3 m. LW, 11.8 m. HW. There is a total of 28,200 tons storage capacity for agricultural products. Ships can load/discharge 24 hours a day, seven days a week.

Tanker**Terminals:**

Five berths, operated by the Port Authority; length 183 m.-244 m.; draft from 9.4 m. to 11.5 m.; night berthing not possible; water and bunkers available. Seven dolphin type tanker berths available at Island View for three vessels of 228 m. one of 186 m., two of 168 m. and one of 260 m. A 396 m. diameter turning basin opposite Berth No. 2, Maydon Wharf, in use. An off-shore oil pipeline and single buoy mooring terminal located at Reunion, south of Durban Harbor. The off-shore oil terminal can accommodate tankers up to 330,000 tons.

Bunkers:

Island View and Point oil installations enable ships discharging and loading cargoes to obtain oil from pipeline on wharf. In addition, a privately owned bunker barge Durban Servicer is available for refueling ships at any quay not equipped with bunker pipeline.

Development:

Construction of Pier No. 2, a new five bath pier, which is to developed for handling of containers.

Shiprepairs:

Available.

Towage:

Eight tugs ranging from 1,640 to 3,940 h.p. fitted with wireless, telephone, salvage and fire appliances, also three pilot tugs and two pilot boats, which have wireless telephone.

Pilotage:

Compulsory.

Airports: National, Louis Botha Airport, 12 km.; N.I.A., Jan Smuts Airport, Johannesburg, 775 km. by rail.

Working Hours: Mon. to Fri., 1st. shift 0600-1400; 2nd. shift 1400-2200. Grain elevators and mechanical loading appliances not affected. Containers worked 24 hours a day, seven days a week, except Christmas Day.

Saturday work at overtime rates only in very exceptional circumstances (e.g., serious port congestion). Work at Island View, Bluff, Grain Elevator, Maize Shed, Alumina Plant, carried out subject to availability of cargo. Sunday, one shift, 0700-1500.

East London

Coordinates: Lat. 33° 02' S.; long. 27° 55' E. Approx. 225 km. N and E of Port Elizabeth.

Authority: South African Railways & Harbors Administration. Port Captain: P.O. Box 101, East London. Tel: 44-2401.

Approach: Entrance to the Buffalo River is maintained by dredging; present depth 14.6 m. on bar. Entrance channel, 10.6 m. LWOST, width 182.8 m. Tidal range 1.67 m. Max. draft for tankers 9.90 m. at any tide, with a max. length of 204 m.

Weather: Prevailing winds, NE and SW.

Largest Vessel: Windsor Castle, 37,639 grt., 239 m.

Accommodation: Good holding ground for vessels at anchorage. Vessels should not anchor when swell is running. The mouth of the river is protected by a solid concrete breakwater 970 m. long. Max. draft at grain elevator is 9.90 m. at any tide. Depth alongside quays 4.5-10.6 m. LWOST Dock area 61 ha. Turning basin, 365 m.; depth 10.6 m. LWOST.

Commercial berthage 2,200 m.

<u>Berths</u>	<u>Length (m)</u>
L-K	506.0
I-F	491.7
N-R	457.2
S and T	388.1
Tanker berth	259.08

Max. draft in harbor is 10.67 m.

If a pilot is on board before 2000 hours a vessel may be brought into East London harbor after dark (weather permitting). If a vessel berths up the river (i.e. berths I, G, F, N, O, P, Q, R) it will be berthed head-up the river. Thereafter it may not sail in darkness.

<u>Storage:</u>	<u>Berth</u>	<u>Cubic m.</u>
	L	5,056
	K	2,394
	I	2,394
	H	1,599
	G	3,397
	F	3,313
	N/O	7,010
	P/R	5,961

Cranes: Cargo cranes: 37 by 4 tons, three by 1.5 tons, one by 5 tons, one by 20 tons, one by 10 tons; forklift trucks: 64 by 3 tons, five by 4 tons, four by 7.5 tons, one by 15 tons; side loaders: one by 25 tons, one by 3 tons.

Provisions: Available from Manhattan Ships Chandler. Tel: 83302; Agua Marine Ships Supplier's. Tel: 29816; I.C.S., Tel.: 24066.

Water: Fresh water is available from all berths.

Bulk Cargo Handling Facilities: Grain elevator with storage for approx. 75,986 tons and shipping rate of 1,633 tons/hr. using four spouts.

Tanker Terminals: One berth, operated by the Port Authority; 9.9 m. draft; night berthing not possible; water and bunkers available.

Bunkers: Marine furnace oil available. Bunkers available at three berths (one berth to be utilized for the supplying of bunkers). Delivery rate is approx. 150 tons/hr.

Shiprepairs: Available.

Towage: Two large tugs, 3,000 h.p. fitted with modern salvage appliances, etc. Two pilot boats.

Pilotage: Compulsory for merchant ships.

Airports: Ben Schoeman Airport, 8 km.; N.I.A., Jan Smuts Airport, Johannesburg, 1,032 km. by rail.

Working Hours: Mon.-Fri., 1st. shift 0600-1400; 2nd. shift 1400-2200 hours. Sat., no work. Sun., 1st. shift 0800-1230; 2nd. shift 1330-1700.

Maputo

Coordinates: Lat. 25° 58' S.; long. 32° 36' E.

Authority: Mozambique Harbors. Railway and Transport Administration.

Approach: Safe entrance. Depth in Cockburn Channel, 7.92 m. LWOST; Hope Channel (disused), 8.53 m. LWOST; Polana Channel, 100 m. wide and 9.32 m. LWOST. Depth South Channel, 9.75 m.; North Channel, 11.58 m., NT. Anchorage inside Polana Bar.

-
- Weather:** Winds, prevailing ENE, SSW, NNW.
- Tides:** R of T, ST 3.66 m., NT 0.91 m.
- Largest Vessel:** By draft; South Channel, 9.75 m.; North Channel, 10.36 m. ST, 9.14 m. NT.
- Accommodation:** On northern side of anchorage are the wharf and piers (depth opposite piers, 9.14 m. to 12.19 m. LWOST) controlled by Board of Ports and Rys. Ferro-concrete wharf, 2,225 m. long, with accommodation for 12 vessels, on which a pre-cooling plant for fruit export trade and a cold storage plant for fish has been erected. Dolphins available at Matola 6.4 km. up river to accommodate timber vessels of 9.75 m. max. draft, 182.87 m. max. length and also tankers.
- Storage:** 17 sheds on wharf, with total capacity of 240,000 tons. Separate storage for 160,000 tons petrol and fuel oil, 50,000 tons coal and 150,000 tons mineral ores.
- Cranes:** 82 cranes available on Main Wharf, 12 at 3 tons, 12 at 4 tons, 51 at 5 tons, four at 10 tons, three at 20 tons. One heavy lift wharf crane with a cap of 60-80 tons. Mobile cranes with lifting capacities between 4 and 12 tons. Also facilities for direct loading into trucks from ship's slings.
- Water:** Water is available at all working berths.
- Container Handling Facilities:** Container Terminal in use for steel cargoes.
- Tanker Terminals:** Three berths at Matola; length 229.50 m. each, draft from 9.90 m. to 10.67 m.; no night berthing; water and bunkers (subject to tidal restrictions) available.
- Bunkers:** Fuel oil at 370 tons/hr. and diesel oil 125 tons/hr. available at Matola oil berths, 5 miles west of Main Wharf. Max. permissible length 228.50 m. depth 9.90 m. LWOST.
- Development:** A steel berth under construction.

Shiprepairs: Available.

Towage: Compulsory for berthing and unberthing.

Pilotage: Compulsory.

Airport: Gago Continho, 6.4 km. from town.

Local
Holidays: Christmas Day (December 25) may be unofficially observed. Port closed on December 31, although vessels may sail up to 1300 hrs. and enter up to 1600 hrs.; on January 2 entrances and sailings return to normal at 0600 (sailings) and 0800 (entrances).

Working Hours: Round the clock. Every vessel.

Nacala

Coordinates: Lat. 14° 32' S.; long. 40° 40' W. About 102.4 km. N. of Mozambique Island. Nacala is now a major port with rail link to Malawi.

Authority: Capitania de Nacala. Tel: 2720. Telegram: Capitania-mar.

Accommodation: The harbor is 0.8 km. wide at the entrance and 60 m. deep with good anchorage for any size vessel. The old wharf can accommodate four vessels with a length of 426 m. Depths: Wharf 1, 7.31 m.; Wharf 2, 6.40 m.; Wharf 3, 9.14 m.; Wharf 4, 9.14 m.

Storage: Three sheds for discharging and two for loading.

Cranes: 12 electric cranes: nine at 5 tons, two at 10 tons, one at 20 tons.

Water: Available from hydrants on the quay (old wharf only) with one hour's notice to Wharf Inspector.

Container
and Ro/Ro

Facilities: The new wharf can accommodate two vessels. Depth 13.71 m.; this has no cranes or sheds but is used by container vessels discharging with ships' gear, a 20-ton forklift, adapted for picking up from the top of containers, moves the containers from the wharf apron to the stacking area.

Tanker

Terminals: Available at anchorage, draft 18 m., and alongside, draft 9.44 m.

Bunkers: At present only gas oil is available from connections on the quay, but must be ordered well in advance.

Development: Two sheds still under construction. Two new berths planned.

Shiprepairs: Very limited.

Towage: One tug available of 1,000 hp.

Pilotage: Compulsory.

Airport: Nampula 193 km.

Local

Holidays: January 1.

Working Hours: 0700-1100; 1300-1700. Overtime 1900-0600.

7.7 Airports

The international airport 22.5 km. from Lusaka is equipped to handle large aircraft and accounts for the majority of all passenger and plane movements. Large regional airports are located at Livingstone and Ndola.

Secondary airports - Chipata, Kasama, Kawambwa, Lukulu, Lundazi, Lusaka, Mansa, Mbala, Mfuwe, Mongu.

Minor airfields - Chinsali, Choma, Isoka, Kabompo, Kabwe, Kalabo, Kalomo, Kaoma, Kapiri Mposhi, Kaputu (Chocha), Kasaba Bay, Kasempa, Katete, Kitwe, Luangwa, Luwingu, Mazabuka, Mkushi, Monze, Mpika, Mporokoso, Mulo-bezi, Mumbwa, Mwinilunga, Namwala, Ngoma, Nyimba, Petauke, Rosa, Rufunsa, Samfya, Senanga, Serenji, Sesheke, Solwezi, Zambezi

7.8 Airlines

Zambia Airways Corporation, a government-owned subsidiary of ZIMCO, provides passenger and cargo services within Zambia and externally. Regular flights are available to Botswana, Kenya, Malawi, Mauritius, Mozambique, Swaziland, Tanzania, Zimbabwe, the Federal Republic of Germany, Cyprus, the United Kingdom, and Yugoslavia. Fleet: 4 Boeing 707-320 C, 1 737-200, and 4 HS 748.

National Air Charters Zambia, Ltd. - provides inexpensive air cargo transport services.

The following foreign airlines serve Zambia: Air Malawi, Air Tanzania, Air Zaire, Alitalia, Botswana Airways, British Airways, British Caledonia, Linhas Aereas de Mozambique, Kenya Airways, Royal Swazi, and UTA (France).

7.9 Air Distances

Lusaka to:	<u>Statute Miles</u>	Lusaka to:	<u>Statute Miles</u>
Blantyre	436	Manzini	794
Bulawayo	319	Maputo	777
Chipata	304	Mbala	487
Durban	1,022	Mfuwe	273
Frankfurt	4,676	Mongu	353
Francistown	408	Mumbwa	95
Gaborone	664	Ndola	162
Johannesburg.	746	New York	7,532
Kabwe	68	Paris	4,718
Kariba	84	Rome	4,072
Kitwe	173	Salima	423
Lilongwe	363	Salisbury	251
Livingstone	245	Windhoek	895
Luanda	1,120		

8. Power and Communications

8.1 Electric Power

Over the last ten years electricity consumption in Zambia has more than doubled and installed generating capacity has increased fourfold. By the mid-1970's, the country had achieved self-sufficiency in hydroelectric power and had become a net exporter to Zaire and Rhodesia. The government's drive to create domestic power facilities began after Rhodesia's UDI in 1965 in an effort to eliminate dependency on the Kariba I hydroelectric plant located in Rhodesia. In 1966 the GOZ initiated a project to build two plants at Victoria Falls, one of 60 MW installed capacity (completed in 1969) and one of 40 MW (completed in 1973). In 1968, with funding from Yugoslavia, work began on a 600 MW generating facility on the Kafue River. After its completion in the early 1970's the World Bank provided an additional loan for construction of a retaining dam (the Itzehi Tezhi dam complex) upstream on the Kafue River and for expansion of the facility. Two more 150 MW units were added, raising the installed capacity to 900 MW. Further development could bring Kafue's total capacity up to 1,050 MW by 1981, 1,200 MW by 1982, and 1,350 MW by 1983.

The final major project in the government's power development program was the construction of the 600 MW Kariba II generating plant on the north shore of the lake. Long delays caused by geological problems and cost overruns postponed completion of the plant; however, by 1977 450 MW of capacity were operational with the final 150 MW in progress. In addition the GOZ is proceeding with a program of rural electrification by extending the existing grid and building small hydroelectric stations.

In 1979 total installed capacity of the three main facilities (Victoria Falls, Kafue, and Kariba II) was over 1.6 million kW. In addition, approximately 100 MW were provided by gas turbine and thermal installations in the copperbelt and an unknown amount of local capacity was located in various provincial capitals and towns throughout Zambia. Although consumption estimates vary, approximately 75% of total domestic consumption was in the copperbelt. In all, industry accounted for about 90% of total domestic use, commercial and home consumption for the remaining 10%.

Most power services have been concentrated in a zone about 80 km. wide along the rail line from Livingstone to the copperbelt. Some towns outside this zone also had local power systems, some of them interconnected. In the late 1970's ZESCO, the national electricity corporation, started a program to expand these local systems and, wherever possible to bring them into the main power grid. However, widespread rural electrification has been hindered by a number of diverse factors: the impermanence of many communities

due to the practice of shifting agriculture; low demand for electricity by low income subsistence farmers; and a shortage of materials such as transformers and insulators.

Zambia Electricity Supply Corporation (ZESCO), a government-controlled corporation, is responsible for national and municipal electricity projects. Though bulk power is supplied by the Central African Power Corporation (CAPC) in Zimbabwe, all other power generation, transmission, and distribution is centralized under ZESCO. A national electricity control center at Lusaka, which will make Zambia independent of CAPC was scheduled to begin operation in 1980.

8.2 Petroleum

Zambia has no known petroleum or natural gas deposits. Construction of a 1,710 km. pipeline from Dar es Salaam to Ndola began in 1967. The pipeline, having a capacity of 760,000 tons per annum, was a joint Zambia-Tanzania project financed by Italy. In 1973 construction of a refinery at Ndola (1.1 million ton capacity) was completed. The capacity of the pipeline, which was switched from refined to crude oil, was increased to about 1.1 million by installing an additional 780 km. of parallel pipe and several new pumping stations.

8.3 Coal

At the present time Zambia's domestic coal production is sufficient to meet demand. Industry, and particularly the mining subsector, is the chief consumer of coal. The coal mine at Maamba is the primary producer with reserves of about 50 million tons. Another large deposit of good-grade coal was found in the same region in 1978 and several other deposits have been discovered in other parts of the country.

Production of Energy 1973-78

	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>
Electricity million Kwh	3275.2	5972.7	6196.3	7046.2	8682.7	7883.2
Coal ('000 tons)	940.1	809.5	813.9	762.0	708.1	615.1
Oil ('000 barrels)	6458.0	6178.6	6937.8	6854.6	6200.9	6023.0
('000 metric tons)	852.1	809.0	852.1	907.6	777.0	780.2
Fuelwood (mln. cubic meters)	4.6	4.6	3.5	3.7	n.a.	n.a.

Source: World Bank, Zambia Country Economic Memorandum, 1981.

Estimated Energy Demand 1974-78
(percentages)

	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>
Agriculture	0.9	0.9	0.8	0.8	1.4
Mining	61.6	61.4	61.3	62.1	59.4
Manufacturing and Commerce	16.7	16.7	16.4	16.4	12.2
Transport	3.5	3.6	3.8	3.4	3.3
Commerce and Services	17.3	17.7	17.7	17.6	23.7

Source: World Bank, Zambia Country Economic Memorandum, 1981.

Zambia's Fuel Import Bill 1974-78

	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>
Volume*	6,178.6	6,937.8	6,854.6	6,200.9	6,023.0
Value (f.o.b.) (K'000)	45,998	49,228	63,540	67,388	68,101
Unit Value Index	291	277	362	425	442

* In 1,000 barrels.

Source: World Bank, Zambia Country Economic Memorandum, 1981.

8.4 Radio

Radio programming is provided by the government-controlled Zambia Broadcasting Service. Stations are located at Lusaka, Kabwe, Kitwe, and Livingstone, and programs are broadcast in English and seven Zambian languages. In 1978 there were an estimated 140,000 radio receivers.

8.5 Television

Television-Zambia: Broadcasting House, P.O.B. RW 15, Lusaka; government-controlled agency responsible for television service. Stations are located at Lusaka, Kabwe, and Kitwe. An educational Broadcasting Unit, operating from Kitwe, provides programs for schools. In 1978 there were an estimated 40,000 television sets. Zambia's earth satellite station opened at Mwembeshi in 1974.

8.6 Telephone Network

Direct dialing is available in larger towns and between Lusaka and the copperbelt centers. International telephone and cable service is available from Lusaka to most foreign countries; telex in most commercial centers. In 1978 there were an estimated 77,400 telephones in operation.

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