

**THE AGRICULTURAL SECTOR OF ZIMBABWE**

*This sector asse-ment was undertaken in conjunction with the Southern Africa Development Analysis Project and has been used extensively, but not totally, in the Main Report and Country Papers*

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GLOSSARY OF TERMS AND ACRONYMS

AMA	Agricultural Marketing Authority
CMB	Cotton Marketing Board
CSC	Cold Storage Commission
DMB	Dairy Marketing Board
GDP	Gross Domestic Product
GMB	Grain Marketing Board
GNP	Gross National Product
OAU	Organization for African Unity
RALSC	Rhodesian African Labor Supply Commission
RBVA	Rhodesian Bantu Voters Association
RGP	Rhodesian Government Party
RNFU	Rhodesian National Farmer's Union
TTL	Tribal Trust Lands
UDI	Unilateral Declaration of Independence
US	United States
ZANU	Zimbabwe African National Union
ZAPU	Zimbabwe African Peoples' Union

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## I. INTRODUCTION AND HISTORY

Zimbabwe is located in Southeastern Africa, landlocked and bordering South Africa on the South, Mozambique on the East, Zambia to the North and Botswana to the West. Zimbabwe has approximately 150,333 square miles of area with a population of 6.2 million. 96% of the population is African, 3% European and 1% coloreds and Asians. English is the official language of the White government, business, and education. Most Africans, however speak Shona and Ndebele in their respective territories. The literacy rate for Europeans and Asians is 100% while only 30% of the Africans are literate.

The first Whites to visit Zimbabwe were the Portuguese. They attempted to gain dominion over Mashonaland, the Northern part of the country. However, the Portuguese were unable to establish settlements because of strong chiefs and their military capability, and because of malaria. They maintained a few posts near the coast and the traders ventured inland to the Karanga. During the late 1600's, Dombo and Monomatopa joined forces to wipe out the Portuguese settlers in Domborare. Because of the war with Spain and the opening of Brazil, no further attempts were made to colonize Zimbabwe by the Portuguese.

The first permanent settlement in Zimbabwe was started by missionaries in 1857 at Inyoti. There was opposition to the mission but the King permitted their presence. The Whites could serve as interpreters, mend wagons and weapons and had some medical knowledge. This mission was a failure--for twenty years no converts were found. The missionaries were relegated to serving the needs of Whites.

Gold was discovered in Zimbabwe in 1867 near the Umfuli River. A gold rush to this area began. A Tribal chief, Lobengula granted the London and Limpopo Mining Company mineral rights in 1870 and a similar right in the north to the South African Goldfields Exploration Company. Both of these companies met with limited success.

Cecil Rhodes was one of the men who had a great deal of influence on the future and direction that Zimbabwe went. He believed that "the Anglo-Saxon race" and the British Empire were the future of Africa. He dreamed of a British domination from the Cape to the Nile Valley. Rhodes urged Sir Hercules Robinson to send a representative to negotiate with Lobengula to stop the Boers from moving into Southern Zambesia. John Moffat negotiated and in 1888 obtained the Moffat Treaty. This treaty barred Lobengula from giving land to anyone without permission of the High Commissioner in South Africa.

In October, C. O. Rudd, at the request of Rhodes obtained exclusive metal and mineral rights from Lobengula. Occupation of the land was as much an objective as extracting of minerals, even though a promise of not more than ten White men would be brought into the country. Rhodes proceeded to construct roads, pass laws, maintained a police force and otherwise act as a governing body.

By the end of 1889, the British government issued a royal charter to Rhodes on the basis of the Rudd concession. By 1891, Rhodes had received most of what he wanted. He failed, however, to win Katanga and failed to drive the Portuguese from the East. By 1894, the territories of Mashonaland and Matabeleland were unified. In 1895, the company officially adopted the name Rhodesia. In 1898, the British government recognized the name.

From the early beginning, Africans were subject to discrimination. Through trickery, deceit, and lack of British enforcement of laws, land and minerals were extracted from the Africans. The question of land and cattle was settled by a commission. Land was allocated to the natives in Matabeleland. Virtually all of the traditional grazing grounds of the Ndebele was given away to satisfy claims of the Victoria volunteers. By 1899, 15.7 million acres had been ceded to Europeans. However, many of the Europeans sold out to companies or speculators. The Ndebele were now squatters on what was now private property owned by Whites, having to pay rent to be evicted. The cattle previously owned by the Ndebele now becomes the King's cattle by right of conquest.

The tribes rebelled because of the injustices. However, they were no match with the fire power and were defeated. Many were slaughtered, unknown numbers of Africans killed, and about 822 Whites killed (10% of the population).

In 1898 a constitution was introduced in Rhodesia. This Order in Council remained the governing body of Zimbabwe for a quarter of a century. It called for a legislative council as well as administrative and judicial branches. It provided for two Administrators, one at Bulawayo, and one at Salisbury. The Administrator of Matabeleland was also a member of Council. The Council also had four elected members. While there were no racial bars in composition of the Council, only literates could vote. No Africans could read and write his name so none qualified to vote. Voting eligibility requirements have been tightened since so as to effectively eliminate Africans from the ballot box.

Racial discrimination continued to grow under company rule. Attempts to provide other than menial jobs for Africans were met with resistance by

Whites. Separation was required for mines, farms and domestic service. Segregation occurred in eating, transportation, and forbid ownership of private property. A dual justice system emerged severe penalties for sexual contact between the races. Blacks were barred from serving juries.

Missionaries were the first to provide education to Africans. In 1907, the Native Education Ordinance was passed, giving missionaries supervision of schools providing training for Africans. All training for Africans was separate from Whites and expenditures were 1/130th that for Whites.

As the towns emerged, Blacks begin to move to the towns for jobs, however, they were temporary residents only. They were placed into "locations" while in the urban area, but were expected to return to their rural reserves after earning enough to pay taxes.

By 1910, every male African was required to carry a pass. If he left his district, he had to have a visiting pass, and had to be renewed every twenty-one days. A special pass was needed to seek work in urban areas.

Two other considerations shaped Zimbabwe's future: Would it become a colony or be governed by the chartered company, and would it unite with South Africa. Shortly after World War I, both questions were answered. In 1922, the Whites voted against joining South Africa. In 1923, a new self-governing colony of Southern Rhodesia was established.

Although executive and legislative powers were given to the United Kingdom for the colony, few limitations were actually imposed. The United Kingdom never used its power to disallow laws it found unacceptable. Generally, the colony submitted measures to the Governor prior to introducing them in the Assembly. If the United Kingdom government opposed the bills, they were dropped or amended.

The land questions continued under the new government. The Carter Commission studied the problem and recommended that of 75 million acres outside the native reserves, 48 million should be purchased only by Europeans, 7 million by Africans and 17.8 could go to either race depending on the circumstances. The rest of the land was under the jurisdiction of the Government. The European area, however, included the best agricultural land and all the urban centers. The commission report became the basis of the Land Apportionment Act of 1929 and the 1931 Act. Including the reserves, over one million Blacks received 28 million acres while 48 million acres were available to 50,000 Whites. The Black lands were very poor--waterless, remote and unsurveyed. Blacks were prohibited from buying land or renting in any urban area.

While the political activity centered on Whites some activity did come from Blacks. In 1923, the Rhodesian Bantu Voters Association (RBVA) was founded. Blacks sought out Whites for support of justice, education, and the right to purchase land in exchange for African voters support of the Rhodesian Government Party (RGP). Other parties emerged: Gwelo Native Warfare Association, the Rhodesia Native Association, and a few trade unions. However, they all had little effect because of few African voters, and most were led by immigrants--not by the natives.

During the 1930's, there was a shift in leadership of African political parties from uneducated to educated Shona and Ndebele. While the movements were popular, few leaders emerged. However, during the 1930's, a few sympathetic Whites developed an awareness of African needs. As a result, there were some improvements in living conditions. There were improvements in preventive medicine, medical care and establishment of a Department of Native Education. Some Africans also received higher education abroad.

During the 1930's Huggins came to power. He had campaigned on a ticket of complete segregation. However, he learned that it was not possible. The African economy and the European economy had become so completely intertwined that such a policy would have disrupted the economy. While Africans were not permitted to purchase land in urban areas, they were living there and performing menial tasks, working in secondary industries, and provided labor for agriculture. The government limited its measures to land segregation. All Africans in European areas, except laborers, were to leave by 1941. In urban areas, native townships were established so that Blacks could provide menial labor.

Some limited political progress was also made. Native Councils were given the power to make by-laws, hoping to improve agricultural production. The Native Courts Act allowed African tribunals minor jurisdiction to settle civil disputes between Africans. Additional progress was made after World War II. Under the Native Accommodation and Registration Act of 1946, Black representatives could be elected to Advisory Boards. These Boards were to advise the White municipal governments of African needs and affairs. Membership on the Boards became prestigious for the African elite. However, interests soon waned because of the limited power of the board. By 1947, only 6,000 Africans were qualified to vote but only 136 were registered. Clearly, African political power was limited.

#### A. MOVEMENT TOWARDS FEDERATION

Some discussion of a Central African Federation had been made during the 1930's. The British government saw it as a means of reducing administrative costs, Southern Rhodesia saw it as a chance to gain access to the copper in Northern Rhodesia. Nyasaland, the poorest of the three territories, would

gain economically. White opposition centered on the large number of Blacks that would be brought into the federation. In 1949, a conference of representatives of the three territories was held. The outcome was a unanimous resolution in favor of federation but no clear provision as to the nature. In 1953, a referendum was passed in Southern Rhodesia supporting federation, while the Legislative Council in Northern Rhodesia and Nyasaland approved Federation.

Although Africans had not participated in earlier conferences, they were invited to participate. Five Africans attended, two from Northern Rhodesia, three from Nyasaland, but none from Southern Rhodesia. All five opposed the Federation. Africans boycotted future conferences.

The Federation provided for 35 members and a speaker--17 from Southern Rhodesia, 11 from Northern Rhodesia and 7 from Nyasaland. Twenty-six were to be elected, 9 were to represent African interests, 7 elected and 2 appointed. Four members elected for African interest in the North had to be African and the two appointed members had to be Europeans. An African Affairs Board was established. It was a standing committee of six from the Federal Legislative--three Europeans and three Africans. The Governor-General would appoint the Chairman.

Some progress had been made by Africans. They had a voice albeit small in the legislature. The Federation committed itself to cooperation between races. In Zimbabwe during the 50's, hotels, clubs, driving cars, and restaurants could become multiracial (few did though). The University was multiracial from inception. However, Africans could not live in European areas. African wages began to rise. African professional men were permitted to occupy offices and conduct business. Nevertheless, the majority of the Africans were in subsistence agriculture (4/5) and most urban Africans had insufficient food and clothes.

African political parties began to emerge - The National Democratic Part, the Zimbabwe African Peoples Union, the African National Congress. Many of these were later banned, their leader arrested. In the Northern territories, Blacks were demanding majority rule. In 1960 a new constitution was drawn for Nyasaland, giving an African majority on the Legislative Council. In 1962, the constitution in Northern Rhodesia produced an African Majority on its council. In Southern Rhodesia, pressure was building for a majority rule in cooperation with liberal Whites. Sir Edgar Whitehead proposed a new constitution giving eventual power to the African majority as they advanced educationally and economically--though years in the future. In 1961, Whitehead campaigned on a platform of repeal of the Land Apportionment Act.

The Africans were lead to believe that they would receive a larger share in the Federation Assembly. Nkomo pushed for majority rule in Southern Rhodesia. He visited the United Nations, London, and Ghana where he announced that ZAPU would soon take over the country. His return to the country led to a wave of military reprisal and intimidation. The ZAPU was banned and Nkomo went into restriction.

In 1963, it was evident that none of the territories wanted to maintain the Federation. At the request of Nyasaland and Northern Rhodesia, the Federation was dissolved. Nyasaland became Malawi and Northern Rhodesia became Zambia. In Southern Rhodesia, Ian Smith, the Prime Minister dealt harshly with African dissidents. He now wanted to consolidate White behind him.

B. UNILATERAL DECLARATION OF INDEPENDENCE

Smith began to lead the country towards independence. The British government would not grant independence without provisions for the political rights of the Africans. Smith refused--felt that the White majority wanted independence. The British government refused since Blacks were not permitted to vote. Smith began to threaten a unilateral declaration of independence.

Smith called for an election urging a 2/3 majority for the Rhodesian Front. This margin could make constitutional changes. Smith won overwhelmingly. Negotiations continued with Britain on the independence question. However, the differences between Rhodesian demands and British desires were irreconcilable. On November 11, 1965, the Rhodesian government proclaimed its independence.

The new government proceeded to make changes in the constitution. The rights of Africans were reduced, seats in the Constitutional Council for non-whites were abolished, and final appeal was left in the hands of the Rhodesians. Later the Constitution was amended to allow the arrest and detention without trial or charges anyone regarded as a threat to security. It did give some local administrative powers to tribal chiefs.

Another constitution was adopted in 1969, establishing a republic. The authors wanted to set the stage for political and social developments. However, it emphasized racism--making majority rule when parallel lines meet. Electoral rolls were established by race. All rights were turned over to the legislature.

The new government had a bicameral body--the 23 member Senate, and a 66 member house. In the Senate, ten were whites elected by the House, three were appointed by the President, and ten African (5 Ndebele, 5 Shona). The

Africans were chosen by the tribal Council Chiefs. The House could pass bills over the veto of the Senate.

Fifty members of the House were Whites, Coloreds and Asians selected from the electoral roll. Of the 16 African seats, eight were selected from the electoral roll, four were from each of the tribes, with only the chiefs and headmen voting.

Voter qualifications centered on economic and educational standards. Further, only Whites could belong to the upper roll, while Africans were on the lower roll. Thus, the voter roll itself was purely racial.

The governing of the cities and towns was by mayor and council. However, they were all White since Africans could not reside in municipal boundaries and are "temporary" residents in urban townships. Education and health were the responsibilities of the central government, while police and public services were the responsibility of the local towns.

The Black townships were under the direct supervision of White organizations. There was no African input into their administration. All African housing was owned by the towns. Some areas established African township boards. Coupled with the African Advisory Boards, they made recommendations to the White government on matters affecting Africans.

In the rural areas, the traditional ruling orders had been destroyed. What parts of the tribal system remaining by 1973 was largely the creation of the government. The government appointed and dismissed chiefs at its will. The courts that ruled the tribes were not ethnic groups but administrative units. Chiefs were responsible for tax collection, limited police power and could act as judges. In 1969, legislation was passed to give authority for chiefs to hear some criminal cases.

The legal system in Rhodesia did not change much with UDI. The High Court is the head of the system, with two divisions --Appellate and General Courts. The Appellate Court hears cases from the General Division, and lower court appeals. The General Court hears cases from lower courts and reviews all decisions of the Magistrate's Court. The Magistrate Courts hear criminal and most civil cases involving Whites.

Africans have a different court system. At the head is the Court of Appeals for Africans Civil Cases. It hears cases on appeal from the district commissioners courts. The commissioners are not judges nor magistrates but government officials. If they so desire, they can summon Chiefs to advise him on African law and customs. The lowest level of courts are those held by the Chiefs and Headsmen. They hear civil cases involving all Africans who are residents in the Chief's area.

### C. RECENT POLITICAL DEVELOPMENTS

The drive to insure majority rule for Zimbabwe continued with pressure from within as well as without. Soon after the UDI, Sanctions were imposed by the British government, OAU, and the United Nations. These sanctions were gradually expanded and widened, hoping to bring Rhodesia to its "knees." Internally, guerrilla forces began operating to destroy the Rhodesian government. Two forces, Zimbabwe African People's Union (ZAPU) and Zimbabwe African National Union (ZANU) began to cooperate with guerrilla forces in Mozambique. Small groups of guerrillas were active inside Rhodesia.

Gradually the guerrilla actions expanded, centering on the borders of the country. Occasional excursions were made deeper into the country. The Government responded by expanding its military forces. All citizens between

18-30 were subject to the draft. Many Africans were used as informers and drafted as enlisted men with White officers. Guerrillas attacked white farmers and Africans living in the areas. Gradually the government found itself in a no-win situation with the guerrillas.

Outside pressures continued to mount for a political settlement. The closing of the borders in Zambia and Mozambique met only one avenue to the sea--that of South Africa. The United States began to push for settlement. Kissinger started negotiations with Smith. As a result, in 1976, a tentative plan was set, providing for majority rule in two years. Control of the army and the police would remain in White hands during the transition. This plan was rejected by the Presidents of nearby countries, and the exiled Africans. The plan called for certain guarantees to Whites that their interests would be safeguarded. Some believed that no substantial changes would come because a slim African majority could not get the constitutional changes through the legislature.

Smith rejected later revisions and began his own plan to transfer power. Present plans call for the transfer on December 31, 1978. A new country Zimbabwe will be borne under majority rule. Smith and three Africans have formed an executive council for decision-making. Co-ministers (Black and White) head the ministries and elections are scheduled later this year. White interests will be safeguarded. Twenty-eight of 100 seats in Parliament for ten years or Parliaments will be White, enough to block constitutional amendments.

Guerrilla efforts in the meantime continue. The two groups are now united under the banner Patriotic Front. It is believed it to be a merger of ZAPU under Nkomo operating from Zambia, and Mugabe operating from Mozambique. Even with the transition to majority rule, some guerrilla action may continue-- a problem that any government will have to face.

## II. EXISTING, POLITICAL, CULTURAL, AND ENVIRONMENTAL CONSTRAINTS

### A. POLITICAL CONSTRAINTS

Zimbabwe is presently ruled by a transitional government composed of Ian Smith, Ndabandiyi Sithole, Abel Muzorewa, and Jeremiah Chirau. In elections to be held later in 1978, a new black government will be formed. While White interests are safeguarded for the near future, they will have no direct say in national policy nor can they form any coalition as a part of the future government.

Zimbabwe presently is composed of seven units used by the government for certain administrative and statistical purposes. These units do not have authority to function as a level of government. They are used to represent geographic locations in the country.

#### 1. Trade Relations with Other Countries

Prior to the UDI, exports played a major role in the Zimbabwe. The primary exports during the 1920's and 30's were agricultural and mining. Although imports were important, there was a trade surplus during most years. The ratio of exports to national income rose to as high as 56 percent.

Following the war exports were the mainstay of the economy once again, averaging over 40% during 1946-53. The major items were tobacco, manufactured goods, minerals, and re-exports. Raw materials were exported to Britain, Europe and the United States while manufactured goods went to South Africa, Northern Rhodesia, and Nyasaland. Britain, Northern Rhodesia, and South Africa received 80% of Rhodesian exports and supplied nearly 80% of her imports.

As Rhodesian exports grew, so did its imports. By 1951, the balance of payments were negative. The deficit occurred because of a shift in the terms of trade, large inflow of White immigrants, and loss of investment expenditures.

During the Federation years, exports continued, especially in agriculture (tobacco) and manufacturing. However, by the second half of the Federal period, economic stagnation set in. While balance of payments figures are not available, estimates showed that Rhodesia incurred heavy deficits throughout the period.

After the Federation dissolved, the economy actually improved despite sanctions and dissolution of the Federation. Rhodesia had considerable excess capacity in manufacturing which served as the base for rapid expansion. Sanctions meant that Rhodesian agriculture had to provide food for the country. This feat was accomplished via a heavily subsidized agriculture.

The use of sanctions against Rhodesia was originally thought to be all that would be necessary to stop the rebel regime. Rhodesia was felt to be vulnerable because of the large exports in tobacco and asbestos (40.5% of total exports), and going to two trade partners (47.2% to Zambia and the United Kingdom). Most imports came from two partners, (53.3% from the United Kingdom and South Africa), concentrated in one product (32.0% in machinery and equipment).

By 1968, many sanctions were imposed, including a ban on imports and exports, provisions of investment funds, failure to pay dividends, interests and pensions to Rhodesians and bans on arms, motor vehicles and oil. Not all countries cooperated with the ban--Malawi, Zambia and Botswana economies depended on the Rhodesian economy, and there were friendly governments in Mozambique and South Africa.

Table I presents a summary of trade with selected countries. It is clear that the sanctions were not effective. While trade with West Germany and Australia declined, trade with South Africa, Switzerland and Malawi increased. South Africa, however, is the largest trade partner, nearly 90% of the trade carried out with it. Much of this trade, however, may be passing through South Africa and reaching the world markets.

a. Mozambique

Trade with Mozambique increased after UDI. An agreement in 1967, called for Mozambique to provide power to Eastern Rhodesia through 1975. It is essential that prior to the closing of the Border in 1976, annual exports to Mozambique was valued at US \$18 million excluding 30,000 tons of maize. Imports were valued at US \$5 million.

Trade was not the only relationship. Mozambique provided an outlet to the sea, provided labor for Rhodesian mines and agriculture. Immigrants from Mozambique, who were living in Rhodesia numbered 109,110 (32.3%) in 1969. Mozambique also provided resorts to Rhodesian tourists.

As majority rule comes to Zimbabwe, potential for renewal of close economic and political ties to Mozambique exists. Indeed, under a favorable settlement, extensive trade is likely to re-occur.

b. Malawi

Malawi has relied extensively on trade with Rhodesia. After sanctions, Malawi banned Rhodesian tobacco, hides and minerals but continued to import meats and sugar. The items banned by Malawi were only a very small part of its trade. In fact, Rhodesia planned to expand trade with Malawi during the 1970's. This idea was stifled with the closing of the Malawi border without rail, air and road links to Malawi.

TABLE 1. RHODESIAN TRADE WITH SELECTED COUNTRIES  
1965-1975  
(US\$m.)

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
<b>Exports to:</b>											
<b>South African</b>											
Customs Union	41.0	60.0	80.0	80.0	85.0	95.0	105.0	130.0	200.0	250.0	302.0
Switzerland	5.7	4.2	3.9	3.5	3.6	4.3	4.5	4.6	7.7	7.4	7.3
Malawi	20.8	17.3	14.7	12.6	12.5	18.6	16.1	21.2	21.3	24.1	29.5
Zambia	99.5	64.9	45.1	31.6	30.5	30.5	28.9	29.6	16.2	12.0	nil
West Germany	35.1	30.5	16.0	13.3	1.1	0.6	0.5	0.4	0.5	0.5	0.7
Australia	3.3	0.8	nil								
<b>Imports from:</b>											
<b>South African</b>											
Customs Union	78.0	110.0	135.0	150.0	155.0	180.0	215.0	182.0	220.0	230.0	270.0
Switzerland	1.6	1.9	1.9	2.5	1.5	2.0	2.9	3.2	3.8	4.5	2.8
Malawi	4.4	3.0	2.7	2.9	3.8	5.0	5.3	5.8	7.2	8.4	8.5
Zambia	15.3	7.0	2.9	1.3	0.6	0.5	0.7	0.5	1.5	0.5	0.8
West Germany	10.9	11.2	12.3	12.9	1.2	1.2	1.6	2.0	2.2	2.6	2.5
Australia	4.5	4.1	5.7	5.9	3.5	4.9	4.8	4.1	nil	nil	nil

Source: Strock, Harry R. Sanctions: The Case of Rhodesia, Syracuse University Press, 1968

c. Botswana

Botswana was also heavily dependent upon Rhodesia. Its only rail service was owned and operated by Rhodesia Railways. Nearly one fourth of its imports and 17% of its exports went to or through Rhodesia. Rhodesia furnished sugar, cigarettes, fertilizer, beer, cloth, and ale to Botswana. Fearing retaliation from Rhodesia, Botswana refused to fully comply with the sanctions. However, it did monitor the railway to insure that arms and ammunition, and petroleum was not shipped via rail into Rhodesia.

d. Zambia

Zambia moved during the 1960's to disengage itself from all White dominated countries in Africa. However, because of the interdependence of their economies, it took considerable time to achieve this objective. By 1975, trade was practically nil between the countries. However, some believe that Zambia had secret dealings with Rhodesia that went unreported. There was much opposition to the closing of the border in 1973. In 1976, three leaders called for reopening the border to relieve some of the Zambian economic problems.

e. Other Countries

Several countries also traded with Rhodesia. The United States under the Byrd Amendment purchased chrome. West Germany imported graphite, a kind obtainable in only a few countries of the world. Australia exported wheat for "humanitarian" reasons. Zaire imported maize and coal. Several United Nation inquiries have been made of secret trade with many other countries. Usually this occurs via South Africa, and until the closing of the border, with Mozambique. United Nation reports show discrepancies between import and export figures for tobacco, maize, and chrome. The size of the discrepancies are consistent with Rhodesian export estimates.

It is clear that sanctions were ineffective. Although some adjustments had to be made, exports and imports continue to flow through South Africa, and to neighboring countries. As majority rule approaches and sanctions are lifted, considerable trade is expected to other countries that now deal only indirectly with Rhodesia.

The sanctions, while failing to bring down the Rhodesian economy, have affected the balance of payments. Table 2 presents a summary of the balance of payments. Since 1965, only in 1969 and 1972 did exports exceed imports. Since 1962 the terms of trade have worsened, leading to further problems with the balance of trade.

## 2. Labor

The Rhodesian government drew its labor from several sources. Most of the foreign labor comes from Malawi (48%), Mozambique (33%), and Zambia (13%), and 6% from other countries. The foreign immigrants were workers although many entered as visitors. Prior to UDI, there were two types of labor entering the country: (1) free flow labor which could come in and actively seek employment, and, (2) contract labor which was imported under work contracts. After UDI, free flow labor was not longer permitted. Only labor that entered under the RALSC (Rhodesian African Labor Supply Commission) were permitted to come into the country.

There were problems in using imported labor. Many African Rhodesians could be displaced. Although there appeared to be an adequate pool of labor, many employers preferred the Malawian workers because they were believed to be harder workers and to be more reliable. Nevertheless, pressure was building to limit imported labor. In 1966, free flow labor was banned to all but the eastern districts of Rhodesia. In 1976 foreign labor was limited to employment in mines and in agriculture. Thus since 1966, there has been a decline in the number of foreign laborers in Rhodesia.

TABLE 2. BALANCE OF PAYMENTS CURRENT, 1965/72

<u>Exports</u>	278,3	171,3	169,9	167,2	212,2	247,5	270,8	322,3
Re-Exports	30,9	17,0	12,1	8,5	6,8	6,1	6,5	6,2
Non-Monetary Gold	13,6	12,7	12,6	11,9	12,9	11,1	11,2	12,9
Total + (1)*	322,3	207,5	205,3	193,6	240,7	272,7	298,1	350,0
SERVICES	54,5	44,2	44,6	49,3	54,7	50,5	55,8	63,0
Investment								
Income	20,8	11,4	15,0	15,2	14,1	16,6	17,5	16,7
Transfers	14,6	7,3	11,2	12,0	12,7	13,1	14,7	16,9
Total Credits*	412,1	207,5	276,1	270,1	322,2	352,9	386,1	446,6
<u>Imports (1)</u>	245,2	179,4	192,8	219,9	213,0	249,6	298,9	291,2
Services	76,2	55,8	62,2	58,5	57,7	65,7	80,7	86,1
Investment								
Income	45,6	27,1	26,2	29,0	31,0	36,0	45,1	49,4
Transfers	19,0	11,4	11,4	13,0	17,0	15,6	18,0	19,6
Total Debits:*	386,0	273,7	292,6	320,5	318,6	366,9	442,7	446,3

\* After allowing for internal freight, timing and coverage adjustments

Source: Leistner, G.M.E., ed. Rhodesia: Economic Structure and Change  
Pretoria, 1976.

With the closing of the border at Mozambique in 1976 and previous bans on Malawi workers to South Africa, the South African Mines experienced a severe shortage of laborers. Thus, the WENELA approached the Rhodesian government for permission to recruit Africans to work in South African mines. This agreement was completed in 1975 allowing workers to receive one year contracts with options for renewal. In 1975, 8,600 Rhodesian Africans were recruited, and by October, 1976, nearly 28,000 were recruited.

Even though there was pressure to ban export of Rhodesian labor, it continued. Rhodesia permitted it because of political ties to South Africa and the resulting help to the balance of payments.

During the period 1965-1975, there was net immigration of Whites into Rhodesia. However, in 1976 the trend began to reverse with over 7,000 net exits. Whites flee because of increased guerrilla activity, military duty requirements, political uncertainty and sanctions. In 1974, the Rhodesian government implemented campaigns to increase White immigration. This campaign did not stop the immigration problem.

### 3. Encouragement of Black Independence Movement

The Black political movement has been until recently limited to military efforts to overthrow the government. Most activity occurs in the border areas of Rhodesia. Some efforts were made to encourage its neighbors to aid in limiting guerrilla fighting. South Africa placed police units in Rhodesia in 1967. In 1973, the border to Zambia was closed in an attempt to get Zambian cooperation in limiting guerrilla activity. The Zambian government pledged to help rid the border area of guerrilla activity for its reopening. However, later they felt the border was better closed.

Presently, the Patriotic Front is operating from Zambia and Mozambique. The Front does have the tactful approval as little is being done to prevent guerrilla excursion into Rhodesia. The Patriotic Front has training facilities

in Zambia and other friendly countries. The OAU (Organization for African Unity) also supports the guerrillas. The disruption presents one of the main problems to the White dominated government.

#### 4. Political Linkages with other States

Officially, no government has recognized the Smith regime nor the Independence of Rhodesia. British sovernty is still recognized as the only legal governing authority. Some counselor representation did exist in Rhodesia until 1970--South Africa, Portugal and the United States. The United States withdrew its Consulate-General in 1970 when the Republic was established. Portugal followed in 1974. Only South Africa now has consular representation in Rhodesia. South Africa has been encouraging a negotiated settlement and in 1975 withdrew its units from Rhodesia.

The Rhodesian government maintains an Information Office in the United States. However, they do not have consular or diplomatic states. They are registered with the Justice Department under the Foreign Agents Registration Act.

#### 5. Domestic Politices of Significance to Agriculture

##### a. The Rhodesian Economy

The Rhodesian economy is basically one of manufacturing and agriculture. Manufacturing sections accounted for nearly one fourth of national income and agriculture is 16% in 1975 (Table 3). Agriculture has experienced a slight decline between 1966 and 1975 in its share of GDP while manufacturing increased. Distribution is the third largest component. Transportation, distribution, construction, mining, electric, water and public administration make up a small part of GDP. Total GDP approached \$2 billion in 1975.

The Rhodesian economy has expanded considerably since UDI. The average annual real growth rate has been 6.5%. There have been two distinct periods, one of stagnation, and one of rapid growth. From 1965-1968, the economy was

TABLE 3. RHODESIA'S GROSS DOMESTIC PRODUCT BY SECTOR  
(In millions of Rhodesian dollars)

	1966 R4 mn	1966 Percent	1975 R\$ mn	1975 Percent
Agriculture		19.6		16.0
European	85.8	(12.5)	216.3	(11.0)
African	49.0	( 7.1)	95.2	( 5.0)
Manufacturing	122.9	17.9	474.5	24.8
Distribution	89.5	13.0	260.5	13.6
Transport	54.5	7.9	102.6	5.4
Construction	32.6	4.7	106.7	5.6
Mining				6.9
Public Administration	44.8	6.5	122.8	6.4
Electricity, water	24.2	3.5	49.1	2.6
Other sectors	140.0	20.3	349.3	18.2
GDP at factor cost	<u>688.5</u>	<u>100.0</u>	<u>1,909.5</u>	<u>100.0</u>
less: net income paid abroad	-19.2		-42.6	
add: indirect taxes (net)	48.8		126.4	
GNP at market prices	718.0		1,993.2	

Source: South Africa Task Force, USAID, Transition in Southern Africa. . .Zimbabwe, Feb. 1977.

relatively stagnant. GDP grew only slightly. However, from 1969 onward, GDP grew at an average of 8.3% annually. In a few years, double digit rates of growth occurred. Real income also grew rapidly, averaging 4.6% per year from 1968-1974.

The manufacturing industry has been the one experiencing the most growth during this period. With considerable excess capacity as the dissolution of the Federation, there was a base for rapid growth.

Mining increased also. The value of mineral outputs nearly tripled between 1965 and 1974.

Agricultural output also increased. However, the composition of the output changed. Tobacco, a leading crop prior to 1965, was one of the main targets of sanctions. Tobacco production fell from 1965-1968 and ridged controls imposed. These controls were gradually relaxed until they were abolished in 1975. By then, tobacco production exceeded the pre-UDI levels.

Between 1965-1975, Rhodesia achieved self-sufficiency in wheat production and became an exporter of cotton. Maize output increased sixfold during this period, groundnuts increased fourfold and cattle and milk output more than doubled. Because of the sanctions, agricultural output was stressed by the government. Subsidies for export crops, and price supports were begun. Today much of the exports to South Africa are food exports.

The Rhodesian government has also grown considerably since UDI; expenditures have nearly tripled (Table 4). The total public sector contribute about 27% to GDP, including local and central government. For the central government the major expenditures are for General Administration and defense, economic services, and education (78.1% of total expenditures).

b. Foreign Exchange Rate Structure

The exchange rate in Rhodesia was fixed from 1949-1975. After 1965, the Rhodesian pound was the currency. Today it is based on the Rhodesian dollar. The Rhodesian dollar did not follow the devaluations of the South

TABLE 4. CURRENT EXPENDITURES  
OF THE CENTRAL GOVERNMENT - 1965, 1971-1974  
BY TYPE OF SERVICE  
(In R\$ millions)

Type of Service	1965 Expen- diture	Percent of Total	1971 Expen- diture	Percent of Total	1972 Expen- diture	Percent of Total	1973 Expen- diture	Percent of Total	1974 Expen- diture	Percent of Total
General Administration										
and Defense	40.0	33.0	65.3	31.9	67.9	30.6	88.6	34.5	108.6	32.8
Education	23.7	19.6	37.1	18.2	42.4	19.1	46.1	18.0	53.1	16.0
Health	8.9	7.3	15.4	7.5	16.6	7.5	17.9	7.0	21.2	6.4
Social, Cultural and Recreational Services	5.5	4.5	2.3	3.6	7.1	3.2	9.2	3.6	10.7	3.2
Housing and townships	1.4	1.2	1.6	0.8	2.2	1.0	1.8	0.7	1.9	0.6
Economic services	18.9	15.6	46.3	22.7	57.1	25.7	60.8	23.7	97.1	29.3
Contributory pensions	4.3	3.6	7.8	3.8	9.8	4.4	10.9	4.2	13.2	4.0
Public debt service	19.5	16.1	25.4	12.4	23.7	10.8	25.4	9.9	27.5	8.3
Other	-1.1	-0.9	-1.8	-0.9	-5.0	-2.3	-4.0	-1.6	-2.3	-0.7
Total	121.1	100.0	204.4	100.0	221.8	100.0	256.7	100.0	331.0	100.0

Source: South Africa Task Force, USAID, Transition in Southern Africa...Zimbabwe, Feb. 1977.

African Rand until 1975. Today, there is a fairly flexible exchange rate-- the central bank attempts to maintain orderly exchange rates with the world's major currency. Daily rates are quoted against the major currency.

Since South Africa is the major trade partner, Rhodesian policy has sought to keep costs and prices in line by revaluing with the South African Rand. This action has helped to curb inflation within Rhodesia and prevent loss of exports to South Africa. Nevertheless, the terms of trade are unfavorable. Table 5 summarizes the terms of trade from 1964-1975. Immediately after UDI, there was a sharp drop in the terms of trade, and has not improved. Although slight gains were made in some years, the index has fluctuated around 82.

c. Role of Ministry of Agriculture, Research Institutions, Cooperative and Marketing Boards

Research and extension activities have contributed significantly to the growth in agricultural outputs. Despite the drought in 1968, 1970, and 1973, output has risen. The major extension group in the Department of Research and Speciality Services is under the Minister of Agriculture. It has 300 professional and technical officers with an R\$3 million budget per year. Its purpose is to conduct research on agricultural crops. Some research is also done by the Department of Veterinarian Services. The practical problems of agriculture and on farm testing of research are done by the Department of Conservation and Extension. Tobacco and pig research are handled by a separate statutory organization directly responsible to the government through the Minister of Agriculture. They have their own resources derived from voluntary contributions, organized agriculture, and government grants. Sugar research is controlled entirely by the sugar industry. Some commercial farms may also have extension workers in the agricultural fields.

TABLE 5. TRADE AND TERMS OF TRADE  
(Excluding net gold sales)

Year	Unit Value Indices		Terms of Trade
	Imports	Exports	
1964	100,0	100,0	100.0
1965	103,5	104,3	100.8
1966	114,0	93,8	82.3
1967	113,8	90.8	79.8
1968	112,0	92,7	82.8
1969	114,1	98,2	86.1
1970	119,2	102,0	85.6
1971	127,1	103,2	81.2
1971	124,4	102,5	82.4
1973	129,6	110,3	85.1
1974	176,6	144,6	81.8
1975	195,1	155,9	79,9

Source: South Africa Task Force, USAID, Transition in Southern Africa. . .Zimbabwe, Feb. 1977.

In 1971, the Agricultural Research Council of Rhodesia was established. Its main objective was to review and promote all aspects of agricultural research. However, tobacco, pigs, forestry and sugar were specifically excluded from the Council.

Before 1971, the main public sources of agricultural credit was the Land and Agricultural Bank of Rhodesia. Several sources have been added since then, including the Agricultural Assistance Board, Farm Irrigation Fund, Agricultural Diversification Fund, and the Agricultural Loan Fund. In 1971, the Agricultural Finance Corporation of Rhodesia was established to control and administer all governmental sponsored sources of agricultural credit, with the exception of some African Producer Loans.

Prior to 1964, the free enterprise market system was used to marketing most products. The Grain Marketing Board did market maize, sorghum, ground-nuts. The Cold Storage Commission marketed beef and dairy products. However, the total amount marketed through these organizations was 35% of the total agricultural output. Since that time, the marketing boards have taken over about 70% of the output. The Tobacco Corporation was established to acquire the tobacco crops. Wheat, coffee and soybeans have been added to the Grain Marketing Board. Cotton is now marketed exclusively by the Cotton Marketing Board.

In 1967, the Marketing Authority was established. This organization is over the four other marketing boards. The major crop marketed by the private sector is sugar. Other crops are poultry, vegetables, pigs, tin and barley.

In 1971, the Agricultural Development Authority was established. This new authority was to concentrate on the development of agriculture, especially dams and irrigation. Both African and European areas were included in its jurisdiction. Other than its forerunner, the Sabi-Limpopo Authority, little activity has taken place because of lack of public funds.

Cooperatives have played a limited role in agricultural development. Except for pigs, cheese, eggs, and fruit, no crops are marketed through the cooperatives. Their activities are focused on the purchase of inputs and other requirements of the agricultural community.

Other organizations also exist to benefit farmers. These organizations are primarily administrative and utilize funds collected from the European farmers. Such funds include compulsory farm licenses levied on the scale of certain products. The major role of these groups is to promote the interests of the farmer in dealing with the government and other organizations.

The African farmer is poorly served by research and extension agencies. The Ministry of Internal Affairs provides 1,200 high school trained agricultural workers. Religious organizations established schools and provided some agricultural training. Most research efforts are directed towards the European farmer and benefit Africans only in a limited way; e.g., tobacco research is primarily concerned with Virginia tobacco, which Africans are prohibited from growing. Only when research is conducted on Burley tobacco may some benefits accrue to African farmers.

d. Price Controls on Commodities

Since UDI, more and more controls have been placed upon the agricultural sector. Many of these controls have been generated at the request of the producers. Produce prices are generally based upon market realizations, although sometimes government support prices have been provided for certain products. Selling prices on the internal market are controlled with the objective of providing both the producer and consumer a degree of price stability.

Price supports became operative with the establishment of the tobacco corporation. Because of the imposition of sanctions, and the easily recognized Rhodesian tobacco, this crop experienced a severe setback in 1966. The government imposed both production control and price supports. However,

by the early 1970's, adjustments had occurred. A move began to deregulate tobacco and return to a free market system. It appears that by 1975 all price controls on tobacco were removed.

Tobacco was not the only crop with controls. Virtually all output moving through the market was controlled. The Rhodesian government periodically printed and published price information on wheat, maize, cotton, milk and dairy products, groundnuts, and a host of other crops. Such information is published in newspapers, magazines, farm information leaflets, and broadcasted by air. These methods represent the primary way farmers receive information.

There is also limited control over inputs. Contract labor is hired under laws and regulations (Masters and Servants Act). Fertilizer and oil products have periodically been rationed since UDI.

e. Taxation

The government must obviously finance itself in some manner and one of the main sources of revenue is taxes. Direct taxes in the mid-70's yielded about 44% of the current receipts, while indirect taxes yielded 32%. The remainder came from property and sales taxes, and various fees. The major indirect tax included custom duties, levies on beer, cigarettes and liquor. Sales taxes were levied, exempting many essential foodstuffs. The sales tax was regressive, however.

The major direct tax was the income tax imposed upon the individual and corporations. The rate of tax for individuals was 10% for the first \$1,000, 15% for the next \$1,000, 20% for the third \$1,000, 25% for the next \$4,000, 30% for the next \$4,000, 35% on the next \$4,000, and 40% thereafter. The government however wanted to maintain low individual income and profit taxes to encourage White immigration. The corporate tax rate was 33% after UDI, a 10% surcharge added in early 1969, and then raised to 40% by April 1969. At the present, company profit taxes yield 55% of direct taxes.

Much of the agricultural sector did not pay income taxes. Because of rising costs and a decline in the profitable tobacco production, farm income fell. Fewer than 20% of the European farmers pay income taxes.

Taxes on Africans tend to be placed differently. Since the income of Africans is extremely low, few pay income taxes. Other taxes are created. There is a 10% levy made on agricultural production in the Tribal Trust lands. A portion of the African products price is withheld by the marketing boards. The purpose is to provide funds for development of the trust areas. However, few development projects were undertaken. Such taxes are viewed as a disincentive to production and cash sales by Africans.

B. CULTURAL: TRADITIONAL ATTITUDES AND PRACTICES WHICH AFFECT THE DECISION-MAKING OF AGRICULTURAL PRODUCERS

The Rhodesian agricultural economy, as is the case in all other sectors, is largely a dual economy, one that exists for Europeans and another separate one that exists for Africans. For the most part, the European farms are well-organized, mechanized, and fairly efficient. They are largely commercial farms and extensive investments in research (public). Diversification of farm activities was helped by a large number of government sponsored measures. These included cash payments to growers who went along with the tobacco program, allocation of irrigation loans in tobacco growing areas, and the establishment of the Diversification Loan Fund with very low interest loan and lenient repayment terms. In addition, there are subsidies on inputs such as nitrogenous fertilizer and diesel fuels. Also, producer incentive prices were announced for wheat, groundnuts, and soybeans. Furthermore, there have been minimum price agreements that affect corn, cotton, and beef producers.

The total number of farms in the European areas increased from 6,266 in 1965 to 6,900 in 1973. The average size of farms showed very little change - 2,176 hectares in 1965 to 2,150 in 1973. Thus, there has been very little

consolidation of farming units over that period. It is also true that many of the European farms were not using all of their lands. Many were too large to be run efficiently and much land lay idle. Part of the increase in the production occurred as a result of bringing additional land into cultivation as opposed to higher yield per acre. Since tobacco was a high cash crop per acre, more acres of other land was needed to replace the loss of income in tobacco.

The African agricultural sector was primarily geared towards subsistence farming, with most of the output going to home consumption. Very little of its production finds its way to the market. In 1973, out of a total output of R\$202.7 million, R\$143 was produced by European farms; only \$59 million was produced from African farms (25% of the total output). This represented an increased share, up from 19% in 1965.

The European farms are efficient and readily adaptable to change. Such changes are not easily forthcoming in the African sector. Many of the problems that exist in Rhodesian agriculture are peculiar to African agriculture.

#### 1. Land Tenure Arrangements

The land tenure question and the population distribution are closely related. Because of the legislature restriction on Africans, they have only 1/20th the land per capita that Europeans have. There are several distinct areas of land imposed by law. These are European areas, tribal trust lands, African purchase lands, and reserves (in both areas). These areas had originally been established by the Land Apportionment Act of 1929. This act underwent several amendments and in 1970 was replaced by the Land Tenure Act. Under the Land Tenure Act, there was near parity in the areas designated as European and African. Africans were not permitted to purchase land in European areas, and those living there were considered only temporary residents for work purposes. All urban areas and most of the best farmland were designated European areas.

Recent changes made in 1977 permitted Africans to purchase farms in European areas. However, by 1978 only two sales had been recorded. Lack of capital was the major reason Africans cannot purchase such farms. For all useful purposes, the division of land is the same as it was in 1970.

The Tribal Trust Lands cover some 164 delineated geographical areas with 45 million acres, about the same as European areas. There remains 6.6 million acres of national land. The large majority of Africans live in Tribal Trust Lands, 60% of the total African population; 17% of the Africans live in urban areas in designated townships. About 20% live in European areas where they provide labor for European farms. African purchase land is considered to be for the elite Africans; he owns his land, and is educated. Farms in this area average over 300 acres.

The European population is urbanized, over 80% living in urban areas. Only 13% live in European rural areas. A few live in tribal trust areas. Thus, while Europeans have one-half of the land, the vast majority live in urban areas.

As may be expected, the Tribal Trust Lands are among the most densely populated land, 40 people per square mile. Only 5 people per square mile are living in European areas. For all of Rhodesia, the average is 12 people per square mile.

In the Tribal Trust Lands, the property is owned by the tribe. They are communally held and allocated by the Chief. Each Chief has jurisdiction over the land and the population living in that territory. The tribal authority controls the allocation of land for the use of family members of the tribe. At the same time, tribal members do have some rights for a plot of land for a house and garden, even when they have been away from the land

for years. These rights and rules for allocation are based upon customary laws and rules of the tribe, although it is subject to review by Rhodesian authority.

The typical farm family in the tribal trust acres is likely to have use of 6-8 acres of arable land. Of this, he is expected to allow some to fallow, for recovery of the soil, and some may be depleted or eroded. He also has some communal grazing rights for his cattle. Even those who are in areas with small tribes may not have more than 11 acres (no province averaged more than 11 acres for Africans).

Some 66 acres have been defined and set aside as African purchase acres. No communal rights are recognized on these lands. They are purchased by individual farmers and comprise about 10% of the area of Tribal Trust Lands. These lands are administered by the Purchase Land Administration branch of the Ministry of Internal Affairs. This agency surveys the land, lay out the roads, sets townships, farm borders, and selects the farmers for settlement. To qualify, one must have at least US \$840 in capital, possess a master farmer's certificate or attend agricultural schools. Possession is given after a period of 20 years during which the farmer must beneficially occupy the land and make annual payments. He is subject to inspection and disposition if he uses poor farming practices. The mortgage can be paid off after seven years if the farmer desires. The price of the land ranges from \$400 to \$1,800 per farm. Presently, 9,000 farms are occupied of which 5,000 are held under free hold title, 4,000 still operate under lease purchase agreement. These farms occupy about 2.8 million acres with an average of 310 acres. Of that, about 60 are potentially arable, 40 acres of it under cultivation. The rest of the purchase lands are surveyed, but not yet occupied. It is estimated that some 2,000 new farms can be settled in the available area.

## 2. Inheritance

Two types of rules exist under which the Africans live. In the Tribal Trust Land, since the lands are communally owned, title is in the hands of the tribe. One person cannot deed, will, or sell the property to which he is assigned. His rights to the land are the same rights all other tribesmen hold.

In the African Purchase Land the farmers are prohibited from subdividing their lands. Thus, sons cannot be given a homestead on the father's land, as it can be in trust lands or where normal private property rights are acknowledged. The inspector can evict anyone they consider a squatter. Presumably though, one is able to provide for inheritance under private property laws. Nevertheless, some informal divisions do occur. Farmers are free, however, to sell their lands to others with no restrictions, once their property is paid for.

Most purchase farmers tend to be fairly old. The median age ranges from 51 to 64, depending upon the province. The median age for all African farmers is 60 in the purchase areas.

## 3. Role Of Chiefs and Other Traditional Leaders

One of the big differences in the Rhodesian African tribes is that chiefs in the true tradition do not exist. Chiefs that exist today are appointed by the government. These persons, however, do have the respect of the tribe as if they were born into chiefdom. The Chiefs can be removed from office by the government. Some leaders believe that this helps the divide and conquer philosophy of the Smith regime.

The Chiefs do play an important role in African areas. According to the tribal view, land is owned by God. The Chief is the administrator of the lands. The Chief allocates land to the wardheads or endorses his selections of lands.

The wardheads in turn supervise the division of land to the village heads. The village heads are responsible for seeing that each family receives a fair amount of land. While the tribal authorities are subject to social and political pressures, it is unlikely that the allocation of land is extremely unfair. Furthermore, there is an obligation to see that all members of the tribe are given their rights to the land, as long as they remain a member of the tribe and continue to use the land productively.

C. ENVIRONMENTAL CONSTRAINTS TO INCREASED AGRICULTURAL OUTPUT

1. Soil Types

Rhodesia's land resources are divided into six regions based upon the amount of climatic differences. Region I covers 2% of the country and is suitable for specialized farming. It is restricted to the higher, more mountainous eastern parts of the country. Region II covers 19% of the country and is suitable for intensive farming. Region III covers 17% of the country. This area is marginal for tobacco and maize but can produce drought-resistance crops. It is suitable for semi-intensive crops. Region IV covers 33% of the country and is suitable only for drought-resistant plants. Semi-extensive farming based on livestock is recommended for this part of the country. Region V covers 26% of the country. Only extensive farming based on livestock is recommended. Region VI covers 3% and precludes farming. It has skeletal soils or very poor soils, steep slopes and swamps.

Rainfall varies in these regions and has affected the type of soils. Most soils are medium or fine grain sands originally derived from the decomposition of granite. Some areas of clay loam, and red iron-bearing clays exist. The Highveld soils are mixtures of medium and finer grain sands with moderate amounts of humus. When properly fertilized, fairly heavy crops

of tobacco, beans, vegetables and maize can be raised. Native grasses also make it suitable for beef and dairy enterprises.

The middleveld area soils were not as fully developed as the Highveld soils but are similar in composition. Large areas are in grasses and support livestock. Land in this area needs irrigation, although Africans in this area cultivate soils unsuitable for crops because other good farmland is not available to them.

Soils in the lowveld areas have not been leached and retain considerable calcium and minerals. The soils are thin, of poor texture, and difficult to prepare for crops. However, some areas are cultivated and workable under irrigation. In the Southern and Southwestern areas, the more arid of the lowveld areas support fibrous grasses and shrubs. However, some hardwood trees grow on the sandy Kalahari desert soil in the extreme west. The Southwest grows only tufts of grass and thorn scrub because of windblown sands.

## 2. Rainfall

The regions referred to above are classified primarily by the annual rainfall. Only one region receives year round moisture. That is in parts of Region I, the eastern mountain area. Here Cedar, Mahogany and other tropical hardwood grow and remain green year round. The rest of the country has at least a six-month dry season. In the southwest, very little rainfall exists.

In Region I, rainfall is in excess of 25 inches annually, and may go occasionally as high as 50 inches. The climate provides a cool growing season. In Region II, rainfall ranges from 20-25 inches. Dry spells are somewhat infrequent, and rarely severe. In Region III, rainfall averages 16-20 inches per year. Mid-season dry spells are common and often severe. Rainfall is

low in Region IV, averaging between 14 and 18 inches per year. Seasonal droughts and severe dry spells during the rainy season are quite common. In Region V, rainfall is very low and erratic, averaging less than 16 inches per year. Region VI varies in climatic conditions, but other factors make it unsuitable for agriculture. However, this region covers only 3.1% of the country.

The rainfall in Zimbabwe, around the border areas just about everywhere, is lower than that of the centrally located uplands. Temperatures and evaporation rates near the border are very high. As a result, most border areas are sparsely populated. The only exception is the eastern mountainous border near Mozambique, where the altitude is high enough to enjoy moderate temperatures and rainfall is enough to support settlements.

### 3. Temperature

Zimbabwe is divided into three velds; the highveld, middleveld, and the lowveld. The lowveld consists of territory under 3,000 feet altitude, the middleveld has altitudes of 3,000 to 4,000 feet and the highveld exceeds 4,000 feet. Chart I presents a summary of the different velds and their location throughout the country.

The temperature tends to vary according to the velds and the season of year. Zimbabwe usually has a warm rainy season from November until March. Their summer is a transitional period of diminishing rainfall extending until May. A cool dry season extends from May until August, which is their winter. The hottest time of the year is prior to the rainy season, in September. The temperature tends to range between 80° and 90° F maximum for most of the year. Temperatures above 90° are usually recorded only in September, October, and early November. By the end of November, the rains begin and the temperature drops slightly.



In the highveld, daytime warmth ends quickly after sunset and nights are cool. Night frost tends to occur during July, the coolest month of the year. No parts of Zimbabwe are subject to hard freeze except perhaps some of the mountaintops near the eastern border.

#### 4. Drainage and Erosion

The European farmer is a modern and efficient farmer. He follows all of the recommendations as directed by the Ministry of Agriculture. These recommendations come from both research and practical application on experimental farms. Thus, erosion does not appear to be much of a problem in most of the European areas. Furthermore, since much of the European area is not cultivated because the farms are too large for the farmer to manage, much of it is in grasses, as well as other plants which tend to help develop the soils and prevent erosion.

This practice is not the case in African farming sectors, especially the Tribal Trust Lands. In most areas, these lands are overgrazed because of the high density of population residing and working the soil. Combined with the overgrazing problem are the cropping patterns. Since land in these areas is scarce, there is less opportunity for it to lay in fallow. Many Africans do not follow, or perhaps more importantly, do not have information on good crop and livestock management practices. Overgrazing and poor cropping patterns lead to associated problems of soil erosion. In some areas, e.g., the Mtoko Reserve, the problem is so severe that a land reclamation program has begun. Lands in the tribal areas have been described as the number one problem in Zimbabwe. Most of the lands receive little rainfall, and have soils of poor quality. These soils are not able to absorb and retain water. The soils tend to wash away in the runoff.

The purchase areas are in better condition. Farms are inspected regularly and recommended practices must be followed. Thus, the erosion problems centers in the Tribal Trust areas.

## 5. Water Potential

Water presents one of the more serious problems to Zimbabwe. Rainfall comes for no more than five months (November-March). The mountains on the North and East of the country receives the moist air masses and most water falls in these areas. Basically, Zimbabwe has a dry climate and suffers seasonal shortages of surface water. The uneven distribution of water and heavy, intense storms of short duration prevents seepage into soils. The runoff causes rivers to rise and floods occur frequently. Most rainfall is lost by evaporation. Less than one percent is thought to percolate into the underground reserves. Only 7.7% of the water is believed to run into streams and rivers (Table 6).

The water supplies for irrigation depend almost entirely upon runoff. The optimum storage capacity for the country is estimated at 163% of the mean annual runoff. By 1974, existing capacity was only 11% of the optimum capacity. Nevertheless, there have been heavy investments for dams. Zimbabwe ranks 13th on the list of large dams. There exists 7,200 dams; 85 of them are major. Between 1973-1983, it is estimated that the storage capacity of dams will be doubled.

Some dependence on groundwater is evident, even though most of the country lacks major aquifers. By 1974, there were 26,000 boreholes of which 11,000 were private. While some are placed in African areas, vleis play an important role in African agriculture, because it holds water most of the year and is shallow.

Despite the limiting amounts of water, it is believed that adequate supplies will exist into the 21st century. Of course, without water, management skills, and technology, shortages may occur long before that time.

TABLE 6. SURFACE WATER RESOURCES - ESTIMATED POTENTIAL FIGURES

		<u>Rhodesia</u>
1.	Average Annual Rainfall	mm 67.5
2.	(i) Total Mean Annual Run-off (MAR) $10^9 m^3$ (or $km^3$ ).	20.1
	(ii) Total Mean Annual Run-off expressed in mm	52
	(iii) Total Mean Annual Run-off expressed as percentage of Average Annual Rainfall	7.7%
3.	Total Mean Annual Run-off - Zambezi River at Victoria Falls	30.2
4.	(i) Total Potential Yield at 10% risk $10^9 m^3$	10.5
	(ii) Total Potential Yield expressed as percentage of MAR	52%
	(iii) Total Potential Yield expressed as percentage of Average Annual Rainfall	4%
5.	(i) Total Optimum Storage required to develop Potential Yield $10^9 m^3$	32,8
	(ii) Total Optimum Storage expressed as percentage of MAR	163%
6.	(i) Total Existing Storage $10^9 m^3$	3.6
	(ii) Total Existing Storage expressed as percentage of Optimum Storage	11%

## 6. Limitations to Agricultural Development

The most critical physical limit on agricultural output in the future is the amount and timing of available water. The amount of water available for plant growth in most regions is less than annual rainfall. When the rains come, the deficit of soil moisture must be made up first, and also much of the rain is lost by runoff, evaporation, and transpiration. It is generally believed that 28-30 inches of rain is needed in the highveld and over 35 inches is needed in the lowveld areas to provide adequate moisture for crop growth. Less than 1/3 of the country receives more than 25 inches annually. While some agricultural production can continue in these areas, it must be irrigated to obtain high returns.

The underground sources do not appear to offer lasting solutions. More work is needed, however, to document the size and amount of aquifers. Some research is being done in the Southwest and Western parts of the country to determine the extent, yield, and recharge areas of aquifers. The answer to the country's problem is continuous planning, efficient management, expansion of storage capacity, and recycling and reuse of water.

Planning for water resources requires a large volume of data. Such data does not exist in adequacy. Presently, there are only five hydrological recorders situated on the main rivers throughout the country with more than 40 years of records. Some 465 recorders also exist but have less than 15 years of data. Obviously more information will be needed in planning for water resources. Based on current data an estimate of the surface water resource is given in Table 6a.

The development of the water resources will mean the construction of dams and distribution systems.

Table 6a. SURFACE WATER RESOURCES

Hydrozone		Mean Annual Runoff	
		mm	$10^3 \text{ m}^3$
A	102,980	21	2,208,800
B	62,060	24	1,467,540
C	89,980	58	5,390,500
D	37,660	98	3,694,300
E	85,050	71	5,799,200
F	7,080	212	1,504,500
TOTALS	381,810	484	20,064,840

Source: Leistner, G.M.E., ed., Rhodesia: Economic Structure and Change  
Pretoria, 1976.

Many new dams will have to be built in low rainfall areas, and in traditional African areas. Most dams are multipurpose with agriculture using the largest share of consumption (85%). There are rising pressures from urban growth and industrial expansion, however. At the same time, storage yield studies show only about 50% of Zimbabwe mean annual runoff is available for utilization. The problem of water through this century may not be a serious one in most areas. However, with a long war, destruction of existing dams, and unusual population growth, the water limitation will come very early.

Among the main human limitations of agricultural development is the pressure of the growing population in Tribal Trust areas. The lands are undercapitalized, overcropped--leading to erosion and degeneration of the sorts. As the population increased, less and less land could be taken out to fallow, the traditional African practice. As the Africans were banned and moved from European areas, additional pressures have been building on Tribal areas, and African agriculture has further degenerated. Tremendous research, social and agricultural, will be needed to improve farm management skills in African lands.

In the past, the African farmer cultivated crops on part of his land for several years, and then let it lay in fallow to regain some of its lost fertility. This practice has declined because of increasing population pressure.

The African farmer relies primarily upon family labor. Occasionally, some may be hired. Generally, the farmers in African purchase areas do use superior farming practices to those in Tribal Trust Lands. However, those practices do not approach the level of the European farmer. The lands in the African purchase areas average 310 acres, of which 60 acres

is potentially arable. About 40 acres are cultivated. One of the requirements for purchase of land is that recommended production procedures be followed. Thus, there are a few farms that have productivity levels comparable to that of European farms.

The European farmer concentrates on improving production on existing land rather than attempting to bring additional land into cultivation. Although the land is individually owned, many operated in a company-type organization. The owner provides the financial management and overall production and marketing supervision. Around 4,800 non-Africans are hired as farm managers and operations supervisors. Africans are hired in some of the lessor managerial skilled positions and as farm laborers.

### III. EXISTING DEMAND CHARACTERISTICS OF AGRICULTURE

The marketing of agricultural produce in Zimbabwe is a single channel marketing system, operating for many of the country's most important products, serving primarily the needs of the European farmer. Most products are marketed only through the Agricultural Marketing Authority. Other crops can be marketed by private enterprise; including tobacco, tea, poultry, sugar, fruits and vegetables. However, there is still some degree of control over these products.

The Agricultural Marketing Authority (AMA) was established in 1967 for the purpose of advising the Minister of Agriculture in problems of marketing agricultural products and the coordination of the operations of the former independent statutory marketing boards. In this regard, the AMA acts as the central buyer at annually fixed prices for a variety of agricultural products. It has several other functions: (1) to provide a strong organization to promote the marketing of agricultural products, (2) to advise the Minister of Agriculture, (3) to provide a forum for discussion and negotiations with organized agriculture, and (4) it establishes standards to insure uniform quality.

The AMA operates with four separate divisions, the Cold Storage Commission, the Grain Marketing Board, the Dairy Marketing Board and the Cotton Marketing Board. Each Marketing Board has an authority committee composed of a Chairman, with another member representative of authority management, and the appropriate general manager. Also, representatives of producers of the commodities serve on the appropriate committee. The authority retains its own decisions for policy and other major issues, although other powers may be delegated to the committee.

The Grain Marketing Board (GMB) is the largest of all of the marketing boards. The most important crop handled by the GMB is maize. GMB has exclu-

sive marketing rights to maize. It offers a guaranteed outlet for the crop at prices which are fixed annually. Direct producer to consumer transactions are allowed only in the African areas. Otherwise, the buying and selling rights are held exclusively by the GMB. Other crops controlled under the GMB, would include wheat, groundnuts, sorghums, soybeans and coffee.

The Cold Storage Commission (CSC) slaughters and processes the largest portion of Rhodesian beef production. There are other privately owned businesses but their share of the total market is relatively small and they are not allowed to participate in the export of the beef. The CSC offers a guaranteed outlet to producers at prices which are fixed annually. Because of its size, it influences and stabilizes prices throughout the country. The Dairying Marketing Board (DMB) has slightly different duties. It is concerned exclusively with supplying the home market. The major product is pasteurized whole milk which is delivered to households in the major centers every morning. In addition, it produces butter, ice cream, cheese, milk powder and other products for the local market. There are a few private producer retailers. However, that proportion of the total market is very, very small.

The Cotton Marketing Board (CMB) is the youngest member of the marketing boards. The CMB sets prices for farmers and has led to stability in the country. Approximately 20% of the cotton in 1977 was exported to South Africa.

Normally, the prices paid by the marketing board for the products are not subsidized by the government. They are derived as a blend of sales on the local market at fixed prices and sales realizations on the export market for those products where there is an export of the surplus products. Thus, the entire marketing of most agricultural products is handled by the marketing board system.

Flue-cured tobacco is one of the major crops that is excepted and is marketed under a sale-by-auction system. Merchants and manufacturers purchase the cured tobacco directly from the farmer on the sales floor. The merchant performs an intermediary function selling his product later to another client, usually

an overseas manufacturer. They also help raise finances, aid in processing, packaging, storing, and arrange delivery. While this process is carried out by private enterprise, the overall planning and organization is regulated by the Rhodesian Tobacco Marketing Board.

Other crops are solely regulated by the private enterprises without the assistance of the state marketing organization. Poultry and eggs, sheep and goats, fruits, vegetables, sunflower, and certain crops such as melon are produced entirely by Africans. Tea and sugar cane are among the crops sold in this manner. There are two large companies that operate sugar mills in the lowvelds. They buy and mill sugar from small individual growers as well as their own production. Once milled, the raw sugar is refined by the Rhodesian Sugar Refineries Limited and distributed by Sugar Marketing Limited, a private concern.

Other crops are bought on a contract basis. Barley is grown purely by contract for local markets. Oats, flowers and vegetable seeds are grown by contracts with seed merchants. Some grapes are also grown on contract to viners and fruit and vegetable processing firms. The seed growers association purchases certified seeds of the major crops from registered owners. A number of food processing firms grow their crops and also purchase from individual farmers. Vegetables and fruits are sold by individual farmers but some cooperatives also market much of their produce. Levies are usually collected on sales and used for advertising purposes. Vegetables and fruits are also sold by auction at the Salisbury Produce Market or through the Salisbury independent markets.

Private enterprises also are engaged in the processing of pigs, the largest organization being the Farmers' Cooperative Calston. This company acts as a residual buyer of pigs apart from those produced by its members. It processes and markets a wide variety of pig-based products.

Very little free enterprise exists in the marketing of most products. The

marketing board purchases, sells, distributes, and finances all of the major items. Virtually all exports are exclusively in the hands of the marketing boards. These boards use different grade standards in the purchase of their goods and services. When prices are announced, they are announced according to the grades, for example, in 1975-1976 cotton had four A grades, one B grade, one C grade, one D grade and three M grades. The price of cotton ranges between 11.5¢ to 22¢ per pound. Maize is sold according to classes A, B, C, and D with prices ranging from \$25.57 to \$37.00 per ton. Sorghum is classed in grades A, B, C, and D, with prices ranging from \$23.52 to \$41.50 per ton. Groundnuts (shelled) are graded according to P<sub>1</sub>, P<sub>2</sub>, P<sub>3</sub>, P<sub>4</sub>, C<sub>1</sub>, and C<sub>2</sub>. Soybeans are graded according to classes A, B, and C, and coffee is graded in classes ranging from 2, 3 and up to 10.

Coffee is priced accordingly from \$420 to \$805 per ton. Tobacco is also graded according to the leaf, similar to ways done in the United States. There are various grades of leaf, bugs, and priming.

The Rhodesian farmers receive their prices by information placed in the local newspaper and other published sources. Some of the major sources include the Rhodesian Reporter, the Rhodesian Farmer, and the Rhodesian National Farmer Union information series.

The APL's have had preferential treatment in respect to marketing facilities. In Tribal Trust Lands, arrangements consist largely of buying agents (local stores) appointed by the Marketing Board who will handle the small quantities offered. He receives a commission and deducts transportation charges. The Tribal Trust Lands are also subject to a 10% tax.

Since the 1930's for APL farmers and 1961 for TTL farmers, Africans have been able to deliver directly to the board and avoid the commission and transportation charges. Minimum delivery was 26 bags of produce. Cooperative societies have also been permitted for primary marketing since 1960. With

the lifting of sanctions, a period of adjustment will come. Presently, there does not exist the private infrastructure to accommodate the volume of trade that presently passes through the marketing board. If a move towards less regulation occurs, possible sale of government owned facilities, and hiring present employees may be necessary. There may be a reluctance to move toward competitiveness. If there appears to be a large flight of Europeans, the government may be able to conduct its policies through the marketing board. Price supports may be needed to induce African and remaining Europeans to expand agricultural production. Until such expanded production developed, and the private marketing channels were established, the marketing board will still play a major role in Zimbabwe Agriculture.

#### IV. STRUCTURE OF DOMESTIC CONSUMPTION

##### A. TYPES OF GOODS AND SERVICES CONSUMED

Since the UDI, Rhodesia has basically become self-sufficient in food production. It requires very little imports from other countries. It has moved from 1.1% self-sufficient in wheat production to more than 90%. Now, it is able to export near 50% of its cloth and cotton. It is completely self-sufficient in the production of footwear. Fruits, vegetables, and other produce have increased tremendously.

The Africans have not fared quite as well because of the severe setback in maize production as a result of overgrazing and poor production practices. They have to import maize from other sections of Rhodesia in order to exist. The Africans also receive a wide variety of leaves, fruits, insects, fungi, roots, and honey from their environment. These items contribute significantly to their diets. They also trap and hunt birds, small animals and large game. The fish caught in the streams and rivers are, for the most part, consumed locally. Except for a large fishery on Lake Kariba, which is of recent origin, there are limited commercial sales and trade of fish. Thus, these are a few statistics relating to fish production and distribution. Nevertheless, the value of fish to the subsistence diet of rural Africans is generally well recognized. Most dams on European farms have been stocked to feed the African population in residence. Fish dams are being introduced in tribal areas.

More important than fish is the game meat. Hunting is controlled, as far as possible, by restricting it to license holders. There are three types of licenses issued. The first one is a general permit which allows someone to hunt a limited number of specified animals anywhere in the country with the approval of the land owner. Secondly, an owner may hunt by license with an unlimited number of specified game on his own land. In both cases, sales of hunted meat is illegal.

While such sales may take place, the bulk of the meat is consumed by the family. The third type of license is the cropping license which permits a land owner to harvest game on land as a commercial enterprise, which is subject to supervision of the Department of Wildlife Management. Game ranching is relatively new and is in the experimental stage. In 1964, only 49 cropping licenses were issued and only 31 game ranches were in operation. By 1967, 108 licenses had been issued. Game has been fairly important to the Rhodesian economy. It has been estimated that in 1964, over 5 million pounds of dressed meat was killed from the three types of licenses. In addition to that, approximately 10,000 animals were estimated to have been killed by Africans without hunting licenses. Nevertheless, it does not appear to be much potential for substantial game hunting as a commercial activity in the near future. From 1920 to 1950, a massive offensive was carried out to eliminate the Tsetse fly. As a part of this offensive, a heavy slaughter of game was undertaken to reduce the reservoir of blood on which the fly lives. Movement of game from region to region was also restricted. The campaign was successful and the tsetse fly was restricted to about 10% of the country along the Northern border and in the extreme Southeast. While game was once viewed as a liability and was freely slaughtered, it is now viewed as an asset and is protected by law.

One of the biggest assets that game and fishing may play in Zimbabwe's future is the development of the tourist industry. Large game reserves and good fishing lakes may be able to attract many people into the country.

#### B. POTENTIAL FOR IMPORT SUBSTITUTION

Prior to UDI, Rhodesia put much of its cropland into the production of tobacco which was a major export crop. They also exported a large quantity of meat into the United Kingdom. Since UDI, there has been an attempt to alter some of the products. Because of the large tobacco units, some of the food crops were not grown, and much of the foodstuffs were imported. Since the imposition of

economic sanctions, this cropping pattern has shifted. The government has encouraged many farmers to produce more food crops and by 1977 had achieved self-sufficiency in virtually all good products.

At the present time, Rhodesia has become a net exporter of foods. Agricultural products now makeup about 45% of exports. Thus, there are very few opportunities or need for import substitution.

Some of the possibilities that do exist are along the borders of the country, especially the Botswana border. In these areas, there is trade by Africans crossing the border. Since maize and millet is the mainstay of the African diets, and since production per acre has fallen on Tribal Trust Lands, there has been a shortage of grains in the border areas. Many of the farmers and families who live in these areas trade with Botswana farmers for corn and other products. The chief problem therefore, is one of distribution throughout the country rather than shortages.

One of the problems that may face the new government is that attempts may be made to reverse the pattern. As sanctions are lifted and trade restored, many farmers may wish to revert again to the production of tobacco. Tobacco competes very favorably to United States tobacco in quality and is sold at a lower price (1970 prices of Rhodesian tobacco was 30¢ per pound while United States prices were over 70¢). Since tobacco is more profitable, it is likely that without controls on production such a shift will be made. If this cropland is taken out of maize production, or from other crops, more need for food imports will be necessary in the future. It is likely that maize production would suffer most for two reasons. One, most of the land that originally produced tobacco was converted to maize production. Two, the soil and water requirements of land is similar for tobacco and maize, therefore, most land is likely to be switched from maize to tobacco.

C. SUPPLY AND DEMAND PROJECTIONS

1. Food Crops and other Food Commodities

The type of projections in terms of agricultural production, that one would make, would depend in large part on the way in which majority rule came into being. In the event of a military conflict, there is likely to be a large flight of Whites out of the country. At this point in time, European Whites are the most efficient farmers in Rhodesia. They produce over three-fourths of the production that goes through regular market channels. Should a government come into power that is totally unsympathetic to the White minority needs, many will flee the country. If this should occur, then much of the managerial ability will have left the country. While a new government may have a policy of relocation into the previous European areas, which were previously not available to Africans, there may be some disruptive effects. It is likely that some output in many crops may fall. This would especially be true in the production of tobacco. Since Africans are presently prohibited from growing flue cured tobacco, they lack the managerial ability.

Fruits and vegetables, and other non-traditional crops not grown by Africans are also likely to suffer. It will take some time for them to acquire the managerial skills and the desire to continue planting these crops. If the transition is done in an orderly fashion, Zimbabwe has a lot of potential. Under moderate leadership it is less likely that a large number of Europeans would leave the country. In fact, they may remain in the country and aid in the development of African sector. Should that happen then, production is not likely to fall much.

The moderate leaders, that are presently forming a part of the government, have indicated that they do not desire to completely eliminate the ownership of property by Whites. The kinds of land they feel will be presently available to the Africans are those that are laying idle. Thus, these leaders tend to center

on the idea of African development of portions of the European area that is currently not being cultivated or is idle.

It is possible that as Africans take over some of the unused European areas, agricultural output could even increase. The Europeans would continue to produce their current share of output, while Africans would be able to produce an additional output from areas that were not previously used. In any case, there is expected to be such changes in Zimbabwean agriculture.

One of the problems that face any new leadership will be whether or not guerrilla activity will continue. Some believe that such activity will die out as a majority rule is realized. Sir Robert Thompson in a recent article in the Readers Digest, felt that a decline in fighting would come because some of the Patriotic Front have alienated the population by raids upon them in the border areas. In addition, they have imposed a tax on some of the tribal areas, further alienating the people. If this is indeed true, the insurgents will lose support and only a few "die hards" will exist. It is not believed that the effects of war have been large. While some roads, bridges, and farms have been destroyed, it has occurred in a relatively small part of the country.

Charles Stater recently made some economic projections of what would happen to the Rhodesian economy under majority rule. He used four distinct patterns: a base case, using 1971 as a base year and continuing as if majority rule did not come. A mild case, a severe case, and a severe constrained case reflects a strong effect on the part of a new government to limit the deficit for imports.

In the mild case, he predicts a 25% reduction in agricultural outputs. Under the severe and severe constrained cases, he predicts up to a 25% reduction in agricultural output. In each case, GNP would be affected. The mild case would produce the largest rise in GNP, while in the constrained case the GNP would rise the least. However, GNP per capita would fall under the mild, the severe, and the severe constrained cases.

Using the mild case as the most likely occurrence, there would be some initial adjustment to the economy in all sectors. By 1979, there would be a decline in government income. Income, GNP, and government deficits would rise and exports would fall below what would be the base case. However, by 1984, the economy would have recovered over the 78-79 levels. Using the base case for 1979, exports were expected to be \$591 million, and \$545 million in the mild case. By 1984 in the mild case, exports would exceed \$731 million. Even in the severe and severe constrained case, exports would be above the 1979 base case. Consumer imports will rise slightly in the mild case, but would not exceed what they were predicted for the 1984 base case.

An important key in maintaining output, is the African sector. If there were incentives, i.e., high prices for output, Africans would respond by increasing production, cash sales and changing cropping patterns. This has been evident since 1960, when Africans began the production of cotton and groundnuts as cash crops. Production of groundnuts doubled between 1967 and 1974 primarily because of higher prices. Cotton also showed substantial growth as Africans increased their share of the market (cotton) from 23% in 1970 to over 50% in 1974.

It has been estimated that over one-third of the Africans in the Victoria district farmed with acceptable standards. Most of the Africans do practice contour, ridging and planting of crops in rows. They are also increasing the use of pesticides and the use of extension programs. One other area of improvement has been in grazing management. With adequate management training and income large enough to support a family, Africans will respond and produce more output. New practices can be taught and accepted by the African farmer. Evidence points to a willingness to grow nontraditional crops. It will mean that the new managerial skills (and price incentive) will be needed for the production of the nontraditional crops.

## 2. Existing Exports

Agricultural products have been the basis of most of Zimbabwe trade historically. Prior to the closing of the borders and the era of UDI, 40% of the trade was concentrated in tobacco and meat products. Tobacco accounted for one-third of the total exports from Rhodesia (Table 7). Meat products accounted for 6%. 18% were from chrome ore, pig iron, and ferrous alloys. Manufactured goods represented a substantial amount of agricultural trade. Many of the manufactured goods were of agricultural origin. Clothing, footwear, cigarettes and textiles, and raw sugar made up much of the manufactured goods that were expected. In addition, about three-fourths of the meat exports were as frozen, fresh, or canned products.

Trade partners during that period were United Kingdom with 21.9% of domestic exports and Zambia with over 25% domestic exports. Many of the Zambian exports were Rhodesian re-exports, almost two-thirds.

Now the pattern has changed. South Africa is now the major trade partner receiving directly or indirectly 90% of the Rhodesian trade. Many of the products find their way onto the world market through indirect methods. In 1975, the United Nations estimated that 38% of the trade with Rhodesia was indirect trade. This amount was down, however, from 1971 when 60% of the trade was through indirect methods. No doubt the Byrd Amendment that was passed in 1971 was a major factor for that drop. Chrome and other mineral products were shipped directly from Rhodesia to the United States and no longer had to go through indirect methods.

South Africa in 1975 directly took about one-half of Rhodesia's exports, \$300 of \$640 million. Since imposition of the sanctions, Rhodesia has shifted somewhat. Immediately after sanctions began, there was a drop in exports. However, by 1971 exports had exceeded the 1965 values. It has continued to grow since that time. Detailed balance of payment statistic figures are no longer issued by the Rhodesia government. This is done to help protect the trade with some of the

TABLE 7. FOREIGN TRADE OF RHODESIA  
(In millions of US\$)

	1964	1965
Domestic Exports, f.o.b.		
Meat and products	14.26	18.84
Tobacco	94.13	112.73
Asbestos	24.02	25.82
Chrome ore	6.00	9.14
Pig iron and ferro-alloys	10.32	9.98
Copper	10.85	15.65
Other items	124.39	149.74
Total	<u>283.97</u>	<u>341.90</u>
Re-exports	36.36	37.06
Imports, f.o.b.		
Food	23.28	22.42
Drink and tobacco	8.98	8.35
Crude materials	13.13	11.74
Mineral fuels and lubricants	14.86	14.18
Chemicals	27.65	32.28
Manufactures	67.34	74.57
Machinery and transport equipment	74.98	91.22
Other	29.56	32.74
Total	<u>259.78</u>	<u>287.50</u>

Source: South Africa Task Force, USAID, Transition in Southern Africa . . . Zimbabwe, February, 1977.

neighboring countries. Nevertheless, some items are apparent. In the acknowledged trade with several countries, agriculture is still a major item in trade. In 1976, 54,400 metric tons of tobacco were exported primarily into South Africa. Other major agriculture export items are cotton and cotton products. Cotton exports have been such a serious problem that South Africa has accused Rhodesia of dumping textiles on the South African market. South Africa has a similar cost to Rhodesian cotton producers, and a similar transport cost. Yet the goods from Rhodesia can be imported at 20% to 30% below cost in South Africa, hence the dumping problem. Another item is meat and meat products, especially in the shoe industry which makes shoes from the leather of beef hides.

In the early 70's, thousands of pounds of meats, vegetables and fruits were flown weekly into Gabon. It is estimated that as much a major percentage of the meat needs of Gabon were met from Rhodesian sources. In 1973, Rhodesian airways established a subsidiary in Libreville, the capital of Gabon. It used this subsidiary to transport meat from Rhodesia to Libreville in route to Europe. Rhodesia also supplied over 87% of Zaire's meat prior to UDI. Trade between the two countries continued after UDI. Even when the border closed to Zambia, Zambia permitted the trans-shipment of Rhodesian goods destined for Zaire.

Botswana and Mozambique served as major outlets for Rhodesian maize, prior to the closing of the border. The reasons that Rhodesians have been able to maintain its trade are because of the much cheaper product and lower transport cost, especially to neighboring African countries. The costs tend to be lower in Rhodesia because of government subsidies, low wages, low interest loans, and because of a government fix price system. With government having a monopoly in the marketing of most agriculture products and a monopoly in the export market, there is very little price competition. Farmers have consistently complained of low prices. Thus, the products can be marketed by the Rhodesian government at much lower prices than the other countries' products. For example, in 1978

Rhodesian government announced wheat prices of R\$100 dollars per ton. This was a drop of R\$13 dollars per ton from the previous year. Despite this drop in price, the cost of fertilizers, pesticides, chemicals and other ingredients in products rose. This was predicted to lead to a reduction in a net return of 43%.

At the same time that wheat prices were lowered, other prices were also lowered or at least remained the same. Cattle prices are the same as they were three years ago and the Minister ruled that these would not increase again this year. The returns to maize have fallen from a 1965 average of R\$1.70 to a low of R\$1.24 per dollars invested. Cotton grown in 1974 received \$1.84 for every dollar invested, but today it has dropped to \$1.41. The cost of salt has risen from \$21.00 to \$46.00 per ton during the three years that cattle prices were fixed. Urea has risen from \$80 to \$180; barbed wire has risen from \$8.50 to \$22.50 and cattle dips have risen by 50% during this same three year period. The Rhodesian farmer today appears to be in a cost price squeeze. However, low prices do give him a favorable export position. The government has served to keep food prices low, in an attempt to encourage White immigration into the country.

If price controls are relaxed, prices are likely to increase. If prices do increase, output also increases in both the African and European sector. It has been proven that in years when prices were relatively high, Africans have responded by increasing output.

This may have an effect on the export market. As prices increase, some of the recipient countries may look to other sources for some of their domestic food needs.

### 3. Potential New Exports

Under majority rule and when sanctions have been lifted, it is likely that tobacco exports will increase tremendously. Farmers will be expected to switch from some other cash crops back into production of tobacco. Alternatively, as more

machines are used, more land may be brought into tobacco cultivation in those areas that can grow tobacco. Presently, it has been estimated that more than 300 million pounds of tobacco are stock piled throughout the country. It is not expected to be difficult for Rhodesia to regain its old markets. The Rhodesian tobacco is mild flavored, low in nicotine and is of very good quality. Furthermore, producer prices are below that of United States tobacco, the main competitor. There is little doubt that tobacco will increase as a major export crop.

We would also expect that exports of Rhodesian cotton and animal products would continue. As the border to Mozambique opens, it would be cheaper to ship through Mozambique for shipment across the world. Transport cost would be lowered which would offset slightly higher cotton prices.

There would be a problem in the export of animals. Present low prices have led to a slaughter of much of the breeder herds. Even if prices rose, it would take some time to reestablish additional herds. There may be several years before large increases in export sales of beef animals would be possible.

Fruits and vegetables would be one area in which some potential exists. One would not expect a large export market in these, however, because of their perishability and the lack of refrigerated transport. Also in many of the neighboring countries which are likely to receive the imports, Africans do not have the income to purchase higher priced fruits and vegetables. Thus, only a limited possibility would exist in these crops.

Maize and millet would offer the best potential to expanding exports to neighboring countries. These two products are important in the diet of many of the African people. Coffee production is also an area into which Rhodesia may be able to move. It has increased substantially since the imposition of economic sanctions. Given that coffee prices on the world market are relatively high, it may be profitable for farmers to expand production of coffee.

Some possibility in the future might exist for Rhodesian wheat. Presently, there is not sufficient production for the export market. However, as more and more irrigation schemes come into marginal lands and low rainfall lands double, cropping of wheat, including both summer and winter varieties offer possibility.

There are some barriers to the expansion of the export market to the Rhodesian farmer. Whether sanctions should be dropped is one problem. The feeling of many Rhodesian farmers is that sanctions will be lifted by many of the countries. The lifting of the sanctions will, to some extent, depend upon whether or not other countries feel that there is true majority rule or just a puppet government. Nevertheless, we would expect some trade to continue to expand because of low production costs. A second problem area is whether or not the government will drop price controls. If price controls continue, farmers caught in the price cost squeeze may leave production or switch to non-controlled items. There will be pressure to keep prices low to benefit Africans moving into the money economy. If price controls lead to farmers becoming insolvent, output will fall as farmers migrate out of agriculture.

#### 4. Process Markets

Processed agriculture products do exist in the Rhodesian economy. After UDI, there was a big rush toward self-sufficiency not only in agriculture but in manufacturing as well. Men's suits, women's dresses and other clothing made in Rhodesia began to enter the market. The government cut imports of cotton, rayon, nylon fabrics and estimated that as many as 1,000 jobs were created in the fast growing textile industry. New industries developed in food processing, beverages, manufacturing canned vegetables, dried milk and products. These industries primarily served the domestic market. It is unlikely that a substantial export market will be developed in the near future.

## V. EXISTING SUPPLY CHARACTERISTICS IN AGRICULTURE

### A. LAND USE POTENTIAL

The dual nature of the Rhodesia economy is no better illustrated than in the land use division between the Europeans and the Africans. While the 1977 Land Tenure Bill opened up Africans to the European farming areas, only a few African farmers have been able to purchase land in those areas because of income constraints. Thus for all practical purposes all the Africans live and farm the African tribal areas and African purchase areas.

The areas assigned to Africans constitute approximately 50% of the land area in Zimbabwe. Tribal trust areas make up nearly 40 million acres; a little over 3½ million acres are African purchase areas; and the rest of the African lands are in forests, parks, wildlife reserves and other specially designated areas.

In the European sector approximately 38 million acres are in general land; almost 2 million in forest land; 4 million in parks and wildlife reserves; and 18 thousand in specially designated areas. By the end of 1977, the European farm areas contained nearly 6,700 farms averaging 5,300 acres each. The total area covered 35.6 million acres. Despite the fact that the output has increased tremendously, there does exist a great deal of inefficiency in the European area. Four thousand of the total farms were not profitable enough to qualify for income tax payments, 32% of the farms are less than one thousand acres, 44% are between one and five thousand acres. Only 7% are larger than 15 thousand acres. Seventy-two percent of European farms make up only 23% of the area and produce 21% of the output. Five percent of the farms account for nearly half the land and produce almost half the output. Thirty percent of the farms in 1977 were reported as insolvent. The inefficient farms

are able to survive because of the large range of subsidies (\$8,000 per farm average) given in the form of loans, price support, capital grants and because of the low wage structure and artificial land prices. The inefficiency in land use in white areas is caused by several factors. Some of the land remains unused while other land is under utilized. In 1976, 3 million acres of European farming land was not used in production. While some of this land is not suitable for production, much of it is in fact capable of producing. Furthermore, between 1975 and 1976, the number of acres of land farmed decreased by over 1 million acres. Much of the land in European areas is used for residential purposes or as week-end farms only. As late as 1972, 30% of the farms in the southwest area were either unoccupied or used only for residential areas. Even land that is being farmed may be somewhat inefficient. Only 15% of the 9 million acres of arable land in European areas are actually being cultivated. In the most productive area of the country, one-fourth of the land is not being cultivated. Also in livestock areas it has been reported that as much as 60% of the farms are non-viable or have serious mismanagement problems and some problems with overstocking of the farms. Thus, there appears to be some potential in the European areas for land development.

One of the concerns that the majority government will have is what should be done concerning the unused European land. The government has urged many of the absentee landlords to make use of their land to produce agriculture products. With the new government coming in, it is possible that some of the land will be expropriated and redistributed to the people in the tribal areas. One of the parties vying for power, the ANC, say they would not interfere with the people's land if it comes to power, provided it was being used to produce food. On the other hand there may be some expropriation in the event food

is not being produced. The question of unused land is a political one, but will also have an economic impact. Any expropriation policy should involve reasonable compensation. This policy would create a climate of support of the new government, rather than one of antagonization.

In the African purchase areas containing around 8,100 farms under individual ownership, there is some provision for potential expansion. Although the farms are relatively small, many do make good use of the land. Most of the purchase area farmers are dependent upon a subsistence type of agriculture. Production levels occasionally may be lower than here than one some of the tribal trust lands. The farms in the African purchase area occupy approximately 2.8 million acres. Thus, there is some potential for expansion. Nearly 1 million acres in surveyed farms are not yet occupied. It is estimated that approximately 2,000 new farmers can be settled in the available area. Because of the larger farms, the African tribal lands have a higher yield per acre than the African purchase areas. However, most of the African produce that is sold through the market comes from the African purchase land.

The African tribal areas are becoming less and less able to feed their growing population. Since the early 1960's, the tribal trust lands have been importing food to help feed itself. In 1977, the output of maize was somewhat over 100 pounds per person less than what was required to meet basic food needs. Much of the problem is due to the tremendous population pressures on the lands. In 1977, there were 675,000 cultivators in the tribal area (nearly three times that which could be safely carried out without damage to the soil). Not only is the land over-populated, but there is also little or no land left for potential younger farmers. Over 40% of the men between the ages of 16 and 30 are landless in the tribal areas. Not only do these

problems exist in Tribal Trust areas, but occur in other areas as well. Seventeen times as much of the land in the Tribal Trust areas were being cultivated as was desirable and this over-cultivation has led to severe over-grazing of land. Fifty percent of the grazing land in these areas were either bare or heavily over-grazed. Despite this fact, the cattle population has increased more than 70% since 1965.

Another problem is that most of the tribal land tends to be in the poorest areas of the country. Over 90% of the tribal land receive an average of less than 20 inches of rainfall per yer. To illustrate this fact, we can turn to Table 8. Only 13% of the Region I land (land having extensive agriculture) is in Tribal Trust Lands. None of that land is in African purchase land, while 71% of this land belongs to the European area. The same pattern is true in Region II: Twenty-one percent of the land is in Tribal Trust Land; only 4% is in African purchase land; and 69% of it is in the European areas. Looking at the lower end, we find that for Region V land, 49% of it belongs to the Tribal Trust Land, 2% in African purchase land and 26% is in European areas. In Region VI, 48% is Tribal Trust and only 2% is designated as European areas. This illustrates a great deal of the problem. Not only do Africans live in a much smaller area, in terms of population, but they also have a poorer quality land and thus have problems in trying to earn a living.

Very little potential exists for expanding Tribal Trust Lands. Even though the Tribal Trust Lands have led to an increase in output over time, this increase has come about at the expense of conservation and management techniques. Most of the increase in African Tribal Trusts and output has developed because of the increases in land usage, failing to keep the land out and allowing it to fallow for a period of time.

TABLE 8. PERCENTAGE OF LAND CATEGORIES IN DIFFERENT AGRO-ECOLOGICAL REGIONS

Land Categories	Agro-Ecological Regions					
	I	II	III	IV	V	VI
National and Unreserved Land	16	6	12	18	23	48
Tribal Trust Land	13	21	39	50	49	48
African Purchase Land	-	4	4	4	2	2
European Area	71	69	45	28	26	2
African Area (percent)	.7	9.9	14.7	36.6	33.4	4.7

Source: Huges, A.J.B. Development in Rhodesian Tribal Areas - Table 4

Total output of Zimbabwe has increased dramatically with the exception of tobacco. Tobacco was the one crop most affected by the economic sanctions imposed after the Unilateral Declaration of Independence (UDI). The production of tobacco actually failed from the 1961 - 1965 average of 105 (1,000 metric tons) to the 1975 average of 95. It dropped again in 1976 to 85 (Table 9).

The output of most other crops increased dramatically. One of the advantages the sanction gave Rhodesia was its self-sufficiency in food productions. The production of cereals increased tremendously, recording gains from 1,119 in the 1961-65 period to 2,000 metric tons in 1974, dropping slightly in 1975 and 1976 (Table 10). Maize more than doubled from 800,000 metric tons to around 1,700,000 metric tons. While millet declined slightly, most of the millet production was being consumed in the traditional or agricultural sector. Wheat is one of the areas that increased tremendously. At the beginning of the USI, Rhodesia produced only slightly over 1% of its wheat needs. Today it produces virtually all of its wheat. Production increased from 2,000 metric tons during the 1961-65 time period to 90,000

TABLE 9. PRODUCTION BY COMMODITY, AND INDICES OF TOTAL AGRICULTURAL AND FOOD PRODUCTION, AVERAGE 1961-65, ANNUAL 1967-76

	Average 1961-65	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
1,000 METRIC TONS											
heat	2	18	18	25	40	82	78	70	85	126	100
corn	833	1,000	950	1,020	700	1,179	1,540	635	1,700	1,748	1,400
millets	240	279	250	250	220	220	220	220	220	220	220
orghum	58	58	55	55	50	50	50	50	50	50	50
peas	21	22	21	23	23	24	24	25	26	26	26
potatoes	22	21	20	22	22	23	24	25	25	25	25
sesame	43	42	44	45	46	47	49	45	50	48	50
tobacco	105	93	60	60	60	60	65	57	80	95	85
cotton	3	17	45	43	53	50	48	35	43	40	38
cottonseed	6	35	88	80	118	110	100	70	86	80	76
peanuts, In Shell	123	77	35	122	104	108	125	110	120	120	122
peas	1	3	2	2	2	3	4	4	5	5	5
sugar, Raw	133	136	120	136	146	175	200	248	250	265	240
beans	170	171	175	173	177	185	195	200	200	200	202
AGGREGATES OF PRODUCTION											
MILLION DOLLARS AT CONSTANT PRICES											
Crops	180.7	181.2	148.9	163.3	150.4	178.1	203.7	150.5	228.4	247.2	217.6
Livestock	58.3	58.7	60.0	59.3	60.7	63.5	66.9	68.6	68.6	68.6	69.3
Total Agriculture	239.0	239.9	268.9	222.6	211.1	241.6	270.6	219.1	297.0	315.8	286.9
Total Food	138.3	144.9	138.0	152.2	137.9	168.3	192.2	161.9	205.0	210.6	191.6
INDICES OF PRODUCTION											
(1961-65 = 100)											
Crops	100	100	82	90	83	99	113	83	126	137	120
Total Agriculture	100	100	87	93	88	101	113	92	124	132	120
Total Food	100	105	100	110	100	122	139	110	148	152	139
Per Capita Agriculture	100	69	75	77	70	78	84	66	86	89	78
Per Capita Food	100	92	85	91	79	94	103	79	103	102	90

Source: U.S.D.A. Indices of Agricultural Production in Africa and the near East 1967-76, Economic Research Service, Statistical Bulletin No 572, June 1977.

TABLE 10. OUTPUT OF SELECTED CROPS AND LIVESTOCK BY YEAR

Crop	1961-65 Average	Year (000) metric ton		
		1974	1975	1976
Cereals	1119	2064	1781	1790
Tobacco	109	80	95	85
Maize	815	1700	1400	1400
Wheat	2	85	85	90
Millet	240	220	220	220
Roots & Fibers	22	23	23	23
Groundnuts in Shell	103	125	125	120
Pigs*	127	192	200	200
Cattle*	3558	57000	6000	6100
Poultry*	6700	8200	8300	8404
Cow Milk Whole Fresh**	218	250	253	255
Fruits	48	71	74	77
Seed Cotton	6	99	144	117
Cotton Seed	4	66	96	78
Vegetables & Melons	75	111	115	119
Sugar Cane	917	2500	2608	2716

\* 1000 head

\*\* (kg/an.)

Source: Production Yearbook, FAO, Vol. 30, 1977.

metric tons in 1976. Roots and tubers remain about constant, again much of this coming from the traditional or African agricultural sector. Ground nuts increased just slightly. Pig production increased substantially from 127 to around 200,000 head of pigs. An almost doubling increase was recorded for cattle, while poultry also increased substantially.

The output of milk for consumption has always been greater than the needs of Rhodesia, hence making milk a surplus product. This has continued throughout the period since UDI. Fruit production has increased substantially also, moving from 48 to 77. Seed cotton and cotton seed are other areas where tremendous increases have occurred, moving from 6,000 and 4,000 metric tons respectively in 1965 to 117,000 and 78,000 metric tons in 1976. Again, the 1976 production was much lower than the previous years. Some of the cotton production is handled by the African farmer.

Two other areas representing substantial growth were vegetables and melons, moving from 75,000 metric tons in 1965 to nearly 120,000 in 1976. Sugar cane production increased almost three-fold, moving from 917 in 1965 to 2,716 in 1976.

It is clear that the affect of the sanctions in reducing the imports of many of the food crops led to big increases in output. The input occurred in part because of development in certain areas. Dams were established which provided irrigation into areas that previously had had relatively little water. These areas were those where much of the sugar cane and cotton had been produced.

While output has increased tremendously, much of it has come out of the European sector. Table 11 summarizes the output by year and by sector. In 1973, the European sector was responsible for 257.2 million dollars of gross output, whereas the African sector was only responsible for 58.5

TABLE 11. AGRICULTURAL PRODUCTION IN RHODESIA 1965-74 IN \$MILLION

	1965	1966	1967	1968	1969	1970	1971	1972	1973
	\$ millions								
<b>EUROPEAN AGRICULTURE</b>									
Gross output	148.6	148.9	150.3	144.4	178.3	175.8	215.8	242.0	257.2
<b>AFRICAN AGRICULTURE</b>									
Estimated consumption	27.6	41.1	53.5	36.6	51.4	30.1	56.5	60.4	36.5
<u>Crop Sales</u>									
Tobacco	0.2	0.1	0.2	0.1	0.4	0.3	0.5	0.4	.4
Maize	1.9	2.8	4.5	0.8	3.0	0.6	1.7	1.9	.4
Groundnuts	1.4	1.9	2.2	0.5	1.5	0.8	2.4	6.7	2.9
Cotton	0.2	0.3	0.5	0.7	2.1	2.2	4.3	7.1	7.6
Other	0.6	0.6	0.5	0.3	0.4	0.3	0.4	0.9	.5
Total Crop Sales	4.2	5.7	7.9	2.5	7.4	4.2	9.2	17.1	11.8
<u>Livestock Sales</u>									
Cattle	3.2	3.4	3.1	3.2	5.0	5.5	6.0	6.7	8.7
Sheep, goats & pigs	0.6	0.5	0.7	0.9	0.9	0.9	0.8	0.1	1.3
Other produce	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	.2
Total livestock Sales	4.0	4.1	3.9	4.3	6.1	6.6	7.1	7.8	10.2
Total Sales	8.2	9.8	11.8	6.8	13.5	10.8	16.3	24.9	22
Total Output	35.8	50.9	65.3	43.3	64.9	49.9	72.8	85.3	58.5
Sales as a % of total output	23%	19%	18%	16%	20%	20%	22%	29%	38%

Note: Estimates of capital formation and changes in stocks have been omitted.

Source: National Accounts and Balance of Payments of Rhodesia 1973 C.S.O. Salisbury.

million dollars output. Of the 58.5 million, more than 36.5 million was used in domestic consumption.

The two most productive regions of the country are the two Mashonaland provinces in the northeast, bordering the Zambia and Mozambique borders. Much of the increase in crop production appeared to take place in these two provinces with most of it occurring on white-owned farms. Only 28.5% of total farm land exists in the two provinces, but the white-owned farms produce 85% of all the maize, 84% of the tobacco (which only includes Virginia tobacco, as Africans are prohibited from growing flue-cured tobacco), 58% of the milk and 32% of the beef. Eighty percent of all fertilizer used by white farmers was used in these provinces.

In 1965, after the sanctions, the tobacco farmers of the Mashonaland provinces began to switch into the production of maize, cotton, wheat, fodder and additional beef cattle. These crops were not as profitable as tobacco, but due to imposed quotas, the farmers had little choice. Cotton could also be grown in the same region as tobacco and the labor was relatively inexpensive. Maize was the crop most preferred as a substitute for tobacco and many farmers were already growing it as a secondary crop. The government employed subsidies as an incentive to the farmers for diversification into other products.

The low lands of the lowveld and middleveld in Regions IV and V, ranching is the only viable enterprise due to the lack of rainfall. However, large-scale irrigation is possible. By the end of 1973, government and private concerns had invested over R\$29 million dollars in this area's irrigation works. New European farming areas were opened and farmers were established on the land. Consequently, there have been major

increases in agriculture production in this area, particularly in regard to production of wheat, cotton and sugar cane.

The cropping pattern in Rhodesia is well established, although some potential for increase in output does exist in many of the areas. The crops with the largest potential would include tobacco, cotton, wheat, sugar cane and some livestock products. Tobacco output could obviously be increased as much of the land that had been previously devoted to tobacco was moved over into other crops. As sanctions are relaxed and more international markets are developed, it will be possible for Zimbabwe to expand exports in this area. In the low lying areas near the mountains where irrigation can be implemented, wheat, sugar cane, sorghum and other types of similar grain crops offer some possibilities. This will depend to what extent the Zimbabwe people can expand their storage capacity and utilization of water.

#### B. LABOR INPUTS

Labor forms the backbone of the agricultural sector. In 1975, 38% of all African employees were employed in the European agricultural sector. Wages in this sector are extremely low. Eighty-five percent of the employees in agriculture earn less than R\$20 cash income per month. They do receive some benefits, however, in that employers may supply some housing, medical care and other needs. It is still estimated that a family of five needs approximately twice that level of cash wages to remain above the poverty line in Zimbabwe. Real wages in agriculture did not rise between 1900 and 1975. In fact, wages actually declined between 1963 and 1972 (Table 12). In 1972, all economic sectors employed 934,000 persons, with the agriculture sector accounting for 353,000 Africans. Nevertheless, there still exists a tremendous shortage of jobs.

TABLE 12. AFRICAN AGRICULTURAL EARNINGS  
AND PRODUCTIVITY, 1963-74

Year	Wage Bill Current Prices \$millions	Av Earnings Current Prices \$ per annum	Av Earnings 1964 Prices \$ per annum	Output per Dollar Labor Cost
1963	34,4	121,9	125,2	100.00
1964	36,2	123,5	123,5	98.5
1965	35,9	123,5	120,4	100.00
1966	33,9	124,6	117,8	109.8
1967	33,2	122,5	114,2	112.6
1968	34,6	122,6	111,7	101.8
1969	36,9	123,0	111,7	119.8
1970	36,8	126,8	112,8	117.7
1971	39,8	131,0	113,1	134.8
1972	44,5	133,0	111,7	135.1
1973	49,5	142,0	115,6	142.3
1974	55,8	155,8	119,0	144.1

Sources: Southern Rhodesia, National Income and Social Accounts of Southern Rhodesia 1946-51 C.S.O.; W. J. Barber, The Economy of British Central Africa, O.U.P., 1961; Rhodesia Monthly Digest of Statistics, C.S.O. (various)

Despite the fact that there is considerable unemployment in African areas, many of the white farmers are relying upon foreign migrants and contract labor, thus increasing the pool of available labor. While there have been some limitations imposed upon the entry of foreign workers, those working in agriculture have been specifically exempted. This exemption has helped keep the agriculture wages below the poverty level. Even when business has been booming, farm workers have gained very little. The wage impact upon external labor supply through the contract system has been considerable. Furthermore, as employers provide relatively poor working conditions for farm employees, local laborers for the most part do not seek out agriculture employment. The supply of contract labor, therefore, has been extremely beneficial to the farmers. These factors have combined to serve as a depressant upon local African employment as well as to forestall any upward increase in wages. If both foreign and local labor have the same productivity, it is clear that profits and benefits may have been larger to employers from this system. The new government will need to examine the contract labor question. Restricting the amount of contract labor coming into the country may mean more jobs. It would mean a decrease in income to workers from other countries, but would be advantageous to Zimbabwe workers.

By 1974, about one-third of the work force consisted of foreign workers. This figure was down from the early 1950's, when up to 60% of the work force was composed of foreign workers. It has remained somewhat consistent from 1970 onward. Most of the work being done by Africans is relatively unskilled labor. Limited, but low-level management jobs are available to Africans. However, their work usually involves harvesting, boiling, thrashing, husking, shelling, preparing tobacco for auction, animal shearing,

pest destroying, spraying, priming, picking fruits and vegetables and packing these on the farm.

Despite the fact that wages have remained low, productivity of agricultural labor has increased. The output per dollar in 1963 was 3.88, and by 1974, it had reached 5.59 (Table 12). The output per dollar employee also grew during that period, from \$474 to \$870. While the wage bill increased from 1963-74, it is apparent that African employees did not receive a larger share of income. Even when output was adjusted for inflation, about 44% increase in productivity occurred.

European labor tends to provide managerial and supervisory skills. Africans generally do not operate in this category except on the Tribal Trust Land and the African purchase territories. In fact, as a part of the requirement to purchase a farm in an African purchase territory, Africans must follow recommended practices, thus, they may have gained some managerial abilities in the production of cash crops. The Africans in the Tribal Trust lands are not able to gain that type of experience. Most of the work in that area is done by using traditional methods such as slash and burn operations. Only on periodic occasions have certain innovations been adopted. Perhaps the most notable one has been the growing of cotton as a cash crop. Africans have not been able to acquire managerial experience in the production of tobacco, most notably, flue cured tobacco, as they are banned from production of that tobacco. Thus as European farm areas open up and this ban is relaxed, there is a great deal of managerial training to be done in this particular area.

#### C. CAPITAL INPUTS

Most of the capital gains in the agriculture sector have been in the European areas. Very little capital exist in the African areas. In African

areas, cattle are used to pull plows as an inexpensive means of cultivation.

In 1975, there were approximately 19,00 tractors and 480 thrashers in the European areas. These figures represent a substantial increase in equipment capital over the previous ten years. It is apparent that the European sector has made considerable strides in mechanizing agriculture output. This achievement has been partly responsible for the increase in yields. European areas have also invested heavily into pesticides, herbicides and fertilizers. The vast majority of fertilizer is sold in the European sector. The chief source of fertilizer used in the African sector is derived from animal manure. A well organized and efficient credit sector exists to serve the needs of the European farmer. In 1973, nearly R\$80 million had been extended on short-term bases to European farmers. Of that figure, R\$29 million came from agriculture cooperatives, R\$15 million from government sources and R\$36 million from commercial banks. Interest rates are subsidized by the government and as such, tend to be very low, averaging around four percent.

Problems do exist in the African areas with the use of credit. First, there is a limited amount of credit established by the Tribal Trust Lands development cooperations and agriculture loan fund. The agriculture loan fund tend to grant loans to trust land farmers. However, relatively few persons take advantage of this loan as it requires a security on crops and branded cattle. Since cattle is a form of wealth, most Africans are not willing to borrow by using cattle as collateral.

#### D. TRANSPORTATION AND STORAGE

Rhodesia has a fairly efficient means of transportation to serve the needs of the European farmer and community. Railroads exist from Zambia

near the Victoria Falls to Balawayo, north of Salisbury, and two railroads run to the Mozambique border. Further, there is a railroad that runs through Botswana into South Africa. There is also another line which runs near the South African border.

In 1974, the Rhodesia Railroad carried 3,000,000 passengers and hauled 12.6 million tonnage. The total length of the railroad is over 3,414 kilometers, which connects Zambia, South Africa and Mozambique. A recently opened railroad connects Rutema to Bert Bridge and South Africa. While the border to Zambia and Mozambique are closed, the only source of exports to the sea is through South Africa.

Closely associated with the railroad is the road motor services branch, which has over 22 central stations with 80 different routes covering 12,00 kilometers. In 1974, 6.8 million kilometers were run and 178,000 passengers were carried. In addition, 99,000 tons of livestock and 564,000 tons of freight were hauled.

Rhodesia has air service provided by Air Rhodesia that basically serves Salisbury, Fort Victory, Buffalo Range, Balawayo, Victoria Falls and Kariba. The airlines also connect with flights to other countries, such as Johannesburg and Durban, South Africa and Blantyre, Malawi. Although this is primarily a passenger airline, in 1973, 132,000 flights were made which carried 5,295 tons of freight.

Roads are divided in Zimbabwe according to the functions. There are roads in municipal areas, main roads, road bridges, roads other than main areas and roads of tribal and African purchase areas. Zimbabwe has a fairly good road system, with approximately 45,00 miles of paved roads. The main highways tend to parallel or act as feeders to the railroads.

Considerable efforts have gone into establishing all weather roads linking the major centers of development. More than 440 high level and 300 low level bridges have been built as part of such a program. Although these have been centered on main roads, it is ultimately to be expanded throughout the country. The expected life of main roads in Rhodesia is 20 years and many roads have exceeded that expectation. There have been attempts to increase axle load weight in steps from 6,400 kilograms to 7,200 kilograms and more recently, to 8,200 kilograms in 1971. This was done to assist with the heavy vehicle design and to keep in step with neighboring territories.

The African areas have not been so fortunate. They have basically been excluded from the road development. Most of the roads that do exist in these areas are graveled, very old and in extremely poor condition. Roads have presented some serious marketing problems to the Africans. The roads that do exist have been subject to extensive traffic as well as the periodic fluctuations in extreme weather conditions - very dry weather on one hand and voluminous rainfalls on the other. These conditions have led to a tremendous deterioration in the conditions of many of the roads. While some attempts have been made to improve the roads, funding has not been adequate. Thus far, for the most part, roads are merely being maintained at minimum levels. Even in the other areas, some of the roads are in relatively poor condition. Since the Unilateral Declaration of Independence, additional strains have been placed on the roads because of a need to transport fuel, coal and maize into the country. Thus, some efforts will have to be made to improve the roads in Rhodesia.

#### E. OTHER INPUTS

As it is true for output, the use of inputs such as fertilizers, pesticides and other chemicals is primarily in the hands of the white

farmer. Black farmers use only only seven and one half percent of the total chemicals in production. Apparently there seems to be adequate supplies of chemicals in Zimbabwe. It is estimated that R\$17 million in chemicals are used annually in agriculture production. There are three major chemical suppliers: The Wend Mill, Rhodesian Fertilizers and Agri-core. When fertilizers are added to agricultural chemicals, the current market value would be approximately R\$70 million gross output each year. In the ten years from 1967 to 1977, output in this area has more than doubled. There are eight industrial units involved in the production of agricultural chemicals. It is an industry which heavily depends upon imported goods and raw materials. Much of the chemical business is thus shrouded in secrecy (detail on foreign trade is classified) because of the sanction, and totally reliable data may not be available. In the case of fertilizers, Rhodesia is self-sufficient in the production of nitrogen and phosphate. Potash, however, must be imported. Phosphate and lime are processed in the country. Nitrogen is manufactured at the Stable Chemical Plant in Que Que.

Zimbabwe chemicals would be important in the development of the agricultural sector. Cotton is one of the few cash crops that African farmers produce. Approximately 50,000 African farmers grow some cotton on varying acreages. Cotton is also one of the crops that is subject to heavy pesticide usage because of insect infestation. Thus many such chemicals are important to the expansion of production. Some of the chemicals available to farmers include fumigants, pesticides, herbicides, "tobacco desuckering," wetting agents, wettable powder dips and fly bait. There is also an adequate supply of chemical equipment such as method bromide applicators and horticultural sprays.

During the early part of the sanctions, Rhodesia went on gasoline rations. This rationing created some initial problems for the agriculture sector, as adequate supplies of agricultural fuel were not available. However, since 1970, farmers have been able to get the supplies they need, both for agricultural and personal recreational uses. Although rations for gasoline and oil products were lifted in 1973-74, the increase in OPEC prices led to increases in the price of fuel, and rations were re-imposed. Recently, proposals have been drawn up to manufacture substitute fuels. It is believed that within a few years with adequate government and private investment, Zimbabwe can make its own fuel. Such fuel could be made from sugar cane, molasses and maize, from which alcohol would be manufactured for use in engines. By using maize, fuel could be made for 18 to 20 R cents per liter, when maize is R\$60 per ton to the farmer. Alcohol produced from sugar cane molasses would cost about the same. Both of these processes would give rise to cattle feed by-products. However, the maize process would require an extra step - that of producing sugar from starch.

Another process would produce fuel from coal. Coal is a resource that Zimbabwe has in many areas. It is believed that the cost of producing oil from coal would be nearly the same as from maize. A possibility exists of combining products from coal and maize (or sugar cane). The resulting end product would be more efficient, have a higher octane, require fewer additives and burn more completely in internal combustion engines.

Extension services in the European areas are adequate. These farms are divided into over 100 conservation areas, served by research and extension personnel. The Department of Conservation and Extension has 352 field personnel to serve the European farmers. This gives a ration of one agent to every 20 farmers. In addition, there are a number of other

organizations dealing with credit, development, research and marketing which also provide services primarily to the European farmer.

The same type of services are not available to the Africans. In 1975, 1,390 agricultural personnel were responsible for serving 600 to 1,000 farmers each in African lands. These workers had high school training at agricultural schools. There were also 132 members of the community development staff serving African areas, who met with Tribal authority to discuss ways in which the area could be developed. There were also 212 members of the community development staff that assisted with non-agricultural extension services.

#### F. MANAGERIAL DECISION MAKING

The average size of farms varies tremendously in Zimbabwe, both by profits as well as by racial considerations. In the Mashonaland North and South provinces are some of the smallest white-owned farms. One might expect these farms to be small because of the intensive cropping. Over three-fourths of the cropland harvested in the country is done so in these two provinces. The average farm size in 1973 in the Mashonaland North was approximately 3,500 acres and in the Mashonaland South, farms average around 3,000 acres (Table 13). The Metabeleland and Victoria Province are primarily ranchland. These provinces, therefore, have very large farms and inputs of labor and capital are relatively low. In 1973, the Metabeleland Province farms average 10,000 acres, while in Victoria, farms exceeded 15,000 acres. The Victoria area is one of the areas with the highest amount of land under irrigation, as about one-half of all land under irrigation in Zimbabwe is located in Victoria.

The Metabeleland province is also one with smaller farms averaging 2,980 acres in 1973. There is also extensive cropland in this province.

The median size of European owned farms in the midlands province averaged approximately 6,000 acres in 1973. The overall size of farms in the country was 5,500 acres.

TABLE 13. EUROPEAN FARM DISTRIBUTION AND AVERAGE SIZED

	No. of Farms	Average Size <sup>1/</sup> (Hectares)	Total Area of Farms (Hectares)
Manicaland	1,063	1,206	1,281,610
Mashonaland North	1,486	1,428	2,122,291
Mashonaland South	1,905	1,107	2,109,564
Metabeleland	1,118	4,067	4,547,283
Midlands	943	2,418	2,281,016
Victoria	442	6,093	2,571,377
Rhodesia	6,937	2,150	14,913,377

<sup>1/</sup> One hectare equals 2.5 acres

Source: Leistner, G.M.E., ed., Rhodesia: Economic Structure and Change, Pretoria, 1976.

European farms averaged nearly 20 times the average size of farm in African Purchase Areas and almost 800 times the size of farms in the Tribal Trust Lands. Although there is variation in the size of African Tribal Trust Land farms, the holdings are extremely small. In no province does the average farm exceed eleven acres. Recommended practices in these areas require an average of fifteen acres for proper rotation and following. Thus, the average Tribal Trust Lands farm cannot follow recommended production procedures. In addition to the cropland, the African farmer uses communal grazing land that gives him the equivalent of fifty additional

acres. However, most of the grazing is done on very low carrying capacity. On the average, it takes ten acres to sustain one animal unit.

Most of the farms in the Tribal Trust Lands follow traditional production practices. In 1968, there were 300,000 plows to serve over 600,000 farmers. Plows were either borrowed or rented by those who did not have them, with cattle and oxen being used as power for the most part. Most farmers also used slash and burn clearing methods.

## VI. PROPOSED AGRICULTURAL SECTOR STRATEGY

The problems facing Zimbabwe's future under majority rule are tremendous. The solutions to the problems will depend on the type of government, cooperation between the different racial groups, the growth and distribution of income, and the availability of funds to finance new programs.

The type of government that comes into power may have some effect on the rate of European emigration from Zimbabwe. Much of the country's progress in the next few years depends a great deal on the managerial skills embodied in the European community. The agricultural community, through the RNFU (Rhodesian National Farmers Union), has expressed a desire to cooperate and support a peaceful solution to the political problem. At the same time, the moderate leaders have expressed similar desires. They do not plan "nationalization" of either industry or agriculture. Programs would be designed to bring unused land into cultivation, and compensate Europeans for losses. Many farmers are also asking for continuation of agricultural development plans, removing government restrictions, and continuation of medium and long term loans through the Agricultural Finance Corporation.

On the other hand, some leaders have called for state ownership of the lands. Any compensation for losses would depend upon the length of time and the profitability in past years. All citizens though would be entitled to land for their usage but ownership would remain in the hands of the state. However, a plan that does not provide compensation may lead to mass exodus of farmers, and be a severe blow to the agricultural sector.

Even with moderate leadership, and a more gradual "africanization" of industry and agriculture, the problems are great. The solutions are time-consuming and will cost hundreds of millions of dollars. The primary agricultural

problems appear to be as follows: (1) land tenure and reform, (2) credit and financial, (3) agricultural training and manpower needs, (4) marketing channels and associated infrastructure, (5) soil and water conservation and management, (6) social and tribal barriers, and (7) changes in government policy towards agriculture.

A. ASSUMPTIONS

Certain assumptions have to be made relating to the changes in the near future that will affect the agricultural sector. Some will be very crucial to the leaders under majority rule. These are as follows:

1. Economic sanctions will be lifted. We must assume that a settlement will come which will be satisfactory to much of the world. Thus the United Nation will relax or eliminate the sanctions. The Zimbabwe tobacco will be able to be sold on the world market, other markets will develop, or reopen, and secret trade will not be necessary. Furthermore, if sanctions are lifted, the United States and other major purchasers of metals and minerals will resume or expand their trade. This development could furnish the new country with foreign exchange and funds to help with the development of its African agricultural sector.
2. Friendly relations will develop with neighboring countries. The cost of transporting export goods to world markets could be reduced if borders with Mozambique were reopened. This action would make Zimbabwe products more competitive in price and time for delivery. Access to the ocean by rail and river will be important. Further, additional trade can begin with those countries.

3. Guerrilla activity will decline. Under majority rule, if the new leadership is supported by Africans, less support of the Patriotic Front will be forthcoming. Pressure may be placed upon the Front to accept the settlement and participate in future elections. In any case, if war does occur, a loss of life, destruction of roads, bridges, dams, and communication would result. Economic disruption would likely be severe, agricultural and industrial output fall. The Zimbabwe people have much potential if an acceptable peaceful settlement can be achieved.
4. Europeans will be encouraged to remain in the country. Since most of the management is in the hands of Europeans, there do not exist Africans who can replace emigrants. Large scale migration by Europeans to South America and other countries will lead to severe economic setbacks in the short run. Perhaps purchase schemes such as the ones used during Kenya's transition would be applicable here, and reduce the flight of Europeans. Thus Zimbabwe would be able to feed itself export foods, and build an industrial sector with the assistance of European citizens.
5. The establishment of a total development package. Land does not exist in sufficient quantities to provide adequate farms for all Zimbabweans. There must be an effort to develop the industrial, manufacturing, and other sectors of the economy. Jobs will have to be provided for all Africans who wish to work. The unemployment rate among Africans is very high. To ensure political stability, increases in the level of living, jobs for a growing population, all sectors will have to be developed.
6. Discriminatory laws dropped. One might expect that among the first things a majority rule government would do is to eliminate laws requiring racial discrimination. Employers would not be required to hire African's

only for certain jobs. Blacks would not be banned from living in certain areas, health, medical, and other services would be equitably provided. Those agencies originally designed to serve only Whites would be merged with those that serve Africans.

7. Foreign assistance will be forthcoming. It would be extremely unlikely that the cost of development could be financed entirely out of local current funds. Zimbabwe will need long term loans and grants from the developed countries. With an elimination of minority government, the United States, United Kingdom, Sweden, World Bank, and others may be willing to assist in the financing of agricultural development projects.

## B. SPECIFIC POLICIES AND PROGRAMS

### 1. Land Reform

Land tenure and reform will be the number one problem to be faced early by the new government. Many problems will exist in making tenure changes. Questions to be answered include, size of plots for individual farmers, time for "resettlement" or takeover, will European farms be subdivided, equitable prices for European farms, who will receive or buy farm lands, how many, etc.

Two choices are available to Zimbabwe: a continuation of individual ownership of land, or have state or communal ownership. Most of the farm groups, and aspiring political groups have somewhat similar ideas. They wish to have a capitalist free enterprise system, allowing for private ownership. This set forth two problems: underutilization of European land and overpopulation of Tribal Trust Lands. Reallocation of unused land may help but is not sufficient because there is not enough land available. Better African farmers would be placed in the European areas to ensure that productivity does not fall. Some attention would have to be given to Tribal Trust Lands for some improvement in land productivity.

A state or communal owned system would require nationalization of farming land, and sell of land to Africans. Many European farmers would be asked to remain to ensure present production levels. Such a plan would have to be a long term strategy, its success depending upon the money available, the rate of training, new management, and production incentives.

Regardless of the type of system that ultimately evolves, there will need to be certain issues resolved:

a. Compensation - European farmers will have to be paid for their lands.

To nationalize without payment will result in immediate migration, leaving the country without much of the management skills. Associated with compensation are questions such as price determination, voluntary vs. mandatory sales, form of payment, and how much land should he be permitted to own if a European decided to stay in Zimbabwe. Gradual Africanization can be brought about by payment guarantees to Whites, foreign exchange guarantees, and equitable prices.

b. Financial. The private sector nor the Zimbabwe government would not be able to finance the amounts involved. External funds will be needed to assist the transfer of ownership.

c. Provision of jobs for African farm laborers. Several possibilities are likely under new tenure arrangements. As African farmers move into European areas, they will have small farms, utilizing family labor. Some hired labor may be displaced as the large European farms are divided or subdivided. Some provision, either non-farm employment or purchase arrangements will need to be made for these workers.

d. Tribal Trust Lands. Several questions that must be answered concerns the the future of Tribal Trust Lands. Should present practices of Chief and Headsmen authority in assigning land be continued, or should the Tribal

Trust Lands be bought under private property law? How much land, if any, should be set aside for tribes and subsistence agriculture? These problems are very serious ones because they affect the social organization and lifestyle of a group of people.

- e. Other considerations. These include the tenure forms, European farmers corporation and studying the experiences of Kenya, African Purchase Lands, and British free hold lease system for possible application.

## 2. Credit and Financial

Credit and finance will be one of the main barriers to agricultural development. Some system for financing and a source of funds will have to be devised. The base for such a scheme already exists in the country, the Agricultural Finance Corporation. This agency will be expanded and a section established to specifically handle the credit needs of Africans who are purchasing farms in European areas.

Credit will be needed for both long term and short term purposes. Long term loans would be needed to purchase land and construct facilities. Short term loans would be needed for production credit. Some intermediate term loans may be needed for breeder stock and equipment.

Low interest rates would be important. This could be accomplished by a government guarantee of the loans. A reduction in risks of such loans could be accomplished by providing adequate extension services to the farmers.

The amount of monies would be considerable. If only 2 million acres of cropland were sold, at \$300 per acre, over \$600 million would be needed. If ranchlands were sold at \$40 per acre, 5 million acres would cost \$200 million. These figures represent less than one-sixth of the European areas.

Low equity requirements will be important. The chief barrier to present migration into European farm areas is the lack of finances. At present, total payment or almost nearly 100% financing is required. If these large down payments continue, very little change will occur.

### 3. Agricultural Training and Manpower Needs

The education of Africans has been neglected for years. It was left in the hands of mission schools until just recently. In 1960, the government served less than 9% of the few students in African education. In recent years, the government has spent more money on African education at the primary level. In 1975, 811,000 Africans were enrolled in grades 1-7, while 38,000 were enrolled in secondary schools; however, only 373 were in the upper level. In addition, 1,312 were enrolled in agriculture (craft, homecraft) and 2,494 in teacher training. Africans must pay a fee but Europeans have compulsory education that is free. Expenditures for Africans are \$40 per pupil and \$475 per pupil for Europeans. The government spends 12 times the amount on European education per pupil than on African education. Only 1,078 Africans were enrolled in the university in 1978 and technical education is virtually limited to Europeans.

The magnitude of the problems are large. Without literacy, the farm worker or owner cannot read. The farmer must be able to read credit agreements, leases, and other important documents. Adult education programs will be needed to remedy this problem. (Some volunteers such as Peace Corp may help solve this problem by teaching in the villages.)

A complete extension and research service will have to be developed. Present farm demonstrators have had training at the agricultural schools, but few were trained at the university level. While they may be able to assist in helping farmers learn new production methods, they will not be able to conduct research on soils, livestock breeding, plant development, etc.. University trained scientists will be needed for such jobs. Even in the case of farm demonstrators, there is a shortage of trained workers.

Providing the training will be expensive and time consuming. To provide all Africans with secondary schooling would require 400 new schools (600 students per school), 800 more graduates, and 10,800 other teachers. There would be new

teacher colleges needed to train the teachers. Estimates as high as 8% of GNP annually would be needed to provide universal education (free). In addition, building and equipment would be needed.

Clearly international assistance will be needed to assist with training in general, and agricultural training in particular. Donor governments, voluntary organizations, universities, foundation, and United Nation organizations will be needed to provide help. Until the country can provide its own trained staff, technical assistance will also be needed.

Zimbabwe will not be able to provide for its own agricultural manpower needs for years. Even with adequate funds to construct secondary and post-secondary schools, African manpower does not exist to fill these positions. Only time will provide the needed secondary and post-secondary school graduates.

Until Zimbabwe can produce its own graduates, large amounts of technical assistance will be needed. Extension and research is needed in agronomy, soil and crop sciences, soil and water conservation and management, animal and poultry husbandry, and farm management. To serve the needs of settlement areas, a staff of surveyors, draftsmen, bookkeepers and lawyers will be needed.

While the Zimbabwean's are developing their agricultural schools, the United States and other donors, can assist in providing training. Zimbabwean agricultural students and secondary students could receive two to four years of agricultural training at United States' universities, institutes, and community college systems. Many jobs may not require professionals and can be filled by these students completing one or two year programs. Others, especially those who wish to be researchers, may pursue college and graduate training. While the students are studying in the donor countries or other African countries, personnel from these countries could be assisting in research, extension and teaching activities.

The manpower shortage will be acute whether or not professional European's flee when majority rule begins. It will be compounded, however, by their departure. Certainly, a policy of mutual cooperation between Europeans and Africans, and of gradual "Africanization" will allow time for the development of African human resources.

#### 4. Marketing Channels

There will be some need to improve marketing in the African areas. Most of these areas have been neglected for years in feeder and main roads and in marketing facilities. Inadequate facilities are abound throughout the Tribal Trust Lands. Most of the present government and institutions involved in marketing are heavily involved in the European commercial sector. They are not geared to marketing of the small amounts of produce that the African farmer has grown. One of the first things to do is to devise or improve the system for handling small amounts of output. Presently, Africans must have 26 or more bags of products in order to sell to the marketing boards directly.

Pick up and delivery points need to be established throughout the African areas. Specific days could be set aside for buying small amount of produce. In addition, many other restrictions will need to be eliminated. The present tax imposed on Tribal Trust Lands output must be removed.

The roads in Tribal Trust Lands will have to be improved. The Tribal Trust Lands have very few good roads, most of which are footpaths or gravel. These roads will not support heavy truck traffic, nor are they passable year round.

More attention could be given to expansion of marketing cooperatives through the African areas. These co-ops could not only market products and provide services but could also include information to the African farmer.

## 5. Soil and Water Conservation and Development

It is apparent that much work will need to be done in this category to protect the natural resources. Not only must there be a need for increased trained manpower, but training of African farmers. The lands are heavily overgrazed and soil erosion is a severe problem in Tribal Trust Lands.

Planning of water resources at the national level is necessary. The government will need to establish Water Catchment Planning authorities. New single and multipurpose dams need to be constructed to provide for year round farming. Controls on use of water from dams could be devised so that during drought, water could be rationed equitably. The available water resources will have to be managed to ensure optimum benefits.

In addition to water management, good soil management will also be necessary. Any further allocation of land should be done so that farms are large enough to permit crop rotation, and ranch management. Adult agricultural education and demonstration programs will be needed to aid in training African farmers in these skills.

A great deal of funds will be needed to build the infrastructure. Roads, dams, and reclaiming lands is very costly. Foreign assistance will be needed.

## 6. Social and Tribal Barriers

Most of the tribes still use traditional methods of farming; slash and burn, communal grazing, extended family concepts, and use and fallow. Oxen and cattle are used for cultivation. In many areas, some changes may have to occur. On APL's families (sons) unofficially live on the farm, thus dividing it into smaller production units.

A choice may ultimately be made as to whether to change some of the living, cultural and social foundations so that agricultural development can be done.

The Zimbabweans will have to make this choice. Rural sociologists will be needed to conduct research to understand and examine the implications of such changes.

#### 7. Changes in Government Policy Toward Agriculture

The present policy toward agriculture is one of heavily subsidized European farming and small taxes for African farmers. This policy must change. While subsidies will have to play an important role in the near future, they will also have to be applied equitably. Africans will especially need subsidies during the early years as they move into the commercial agricultural sector.

Discriminatory policy in marketing, finance, availability of extension and research services, purchase of lands, and production of crops will have to be dropped. Price controls will need to be relaxed or eliminated. As the farmer is in a more precarious position on the cost price squeeze, he may not wish to expand or even continue production. Thus higher prices will be necessary. The creation of a non-discriminatory price and subsidiary policy that is very flexible during the first few years of transition would give incentives for production to increase and would provide for a more even income distribution among the rural poor.

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