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Foreword

In the framework of IIASA's *Water Resources Project*, a decision support system is being developed to help decision makers to understand and solve conflicting problems related to water resources in the shared river basins. The Zambezi basin was chosen as a case study due to the importance of the water problems in the countries of southern Africa. The Zambezi Action Plan elaborated under the auspices of the United Nations Environment Program and signed by most of the riparian countries, creates a unique possibility in Africa for cooperation between the interested governments in solving common water resources problems.

This paper by Semida de Campos Silveira, who was a participant in the IIASA Young Scientists' Summer Program, focuses on the social, economic, and political problems of crucial importance for better understanding of environmental issues in the Zambezi basin. The introduction of sophisticated mathematical tools in the water resources decision processes should be always accompanied by deep understanding of human dimension of development. This paper addresses the need for improved relationship between nature and human activity in the case of the Zambezi river basin.

B.R. Döös
Leader
Environment Program

MANAGEMENT OF THE ZAMBEZI BASIN: SOCIAL, POLITICAL AND ECONOMIC CONSIDERATIONS

Semida Campos

1. Introduction

In the scope of the project Decision Support Systems for Managing Large International Rivers (LIR), a decision support system is being developed to help decision makers to understand physical problems related to water resources and to assess consequences of various policies of management in water systems. A software has been developed considering basic technical management of water resources. It is designed to be general so that it can be applied to a great number of situations.

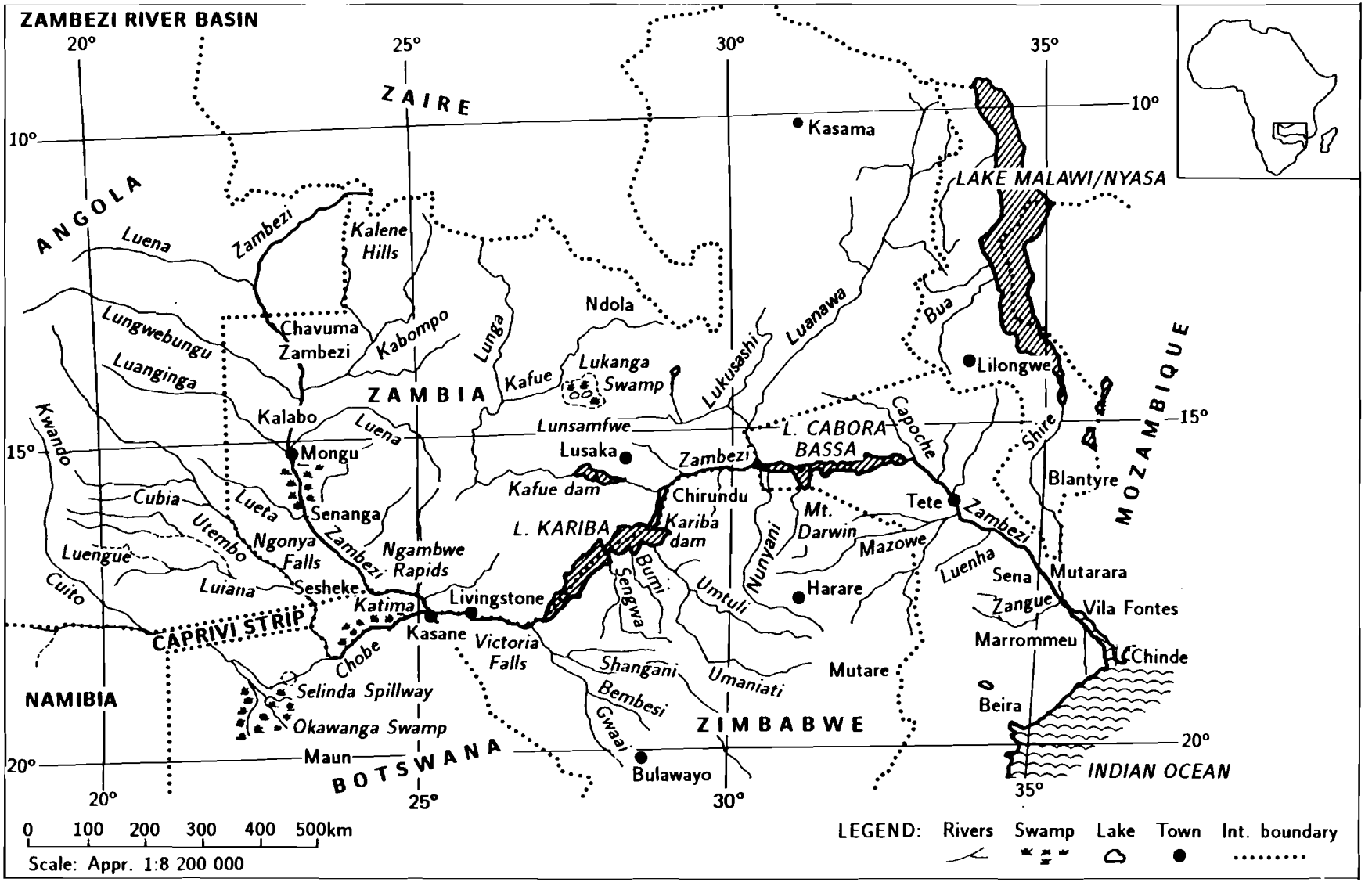
There are numerous problems involved in the management of a large international water system such as the Zambezi basin. The problems range from the physical and biological level to the technical and economic point of view, and are strongly influenced and aggravated by cultural and political factors. The interaction of all these aspects is particularly complicated in Southern Africa due to the singularity of the region's characteristics and the lack of data available about the region as a whole. Therefore, the preparation of a decision support system for the development of the Zambezi basin calls for a different approach, so that efforts can lead to effective results and considerable improvement in the management of this water system.

A decision support system such as the one being developed is far from giving all the answers to the problems that have to be faced by the Zambezi Basin Countries. However, it opens a new possibility for these countries to process information, and quickly generate other essential information about the Zambezi basin. A technical perspective of analysis of the problems gives stronger basis for the evaluation of solutions and policies. However, once technical viability is known, the application of the various solutions has to be analyzed under the diverse conditions of economic and natural resources available, values of the society, political restrictions, etc.

The objective of this report is to discuss the main issues related to the development of a decision support system for managing the Zambezi River basin. A hydrobiological analysis of the Zambezi basin was thoroughly carried out by G. Pinay in his report (Pinay, 1988). Here the focus is on the social and political aspects involved in the exploitation and management of the basin, as well as on the economic constraints that have to be faced. It also discusses the possibility of using policy exercises for introducing this decision support system in the Zambezi Basin Countries, and as a mechanism for communication between the countries involved.

2. The Zambezi Basin

The Zambezi River Basin is the fourth largest river basin in Africa, covering a surface that varies between 1 193 500 sq km to 1 570 000 sq km, due to seasonal fluctuations of its flows. The basin is shared by eight countries: Angola, Namibia, Zambia, Botswana, Zimbabwe, Malawi, Tanzania and Mozambique (maps 1-3). For some of these countries,



Source - UNEP – DIAGNOSTIC STUDY, 1986

Map 1.

the Zambezi basin represents the main part of their drainage system; for others, its importance is related to a specific region of the country. Malawi, for example, has its entire population living within the basin area, while Tanzania accounts for only 4.0 per cent of the basin population (see table 1).

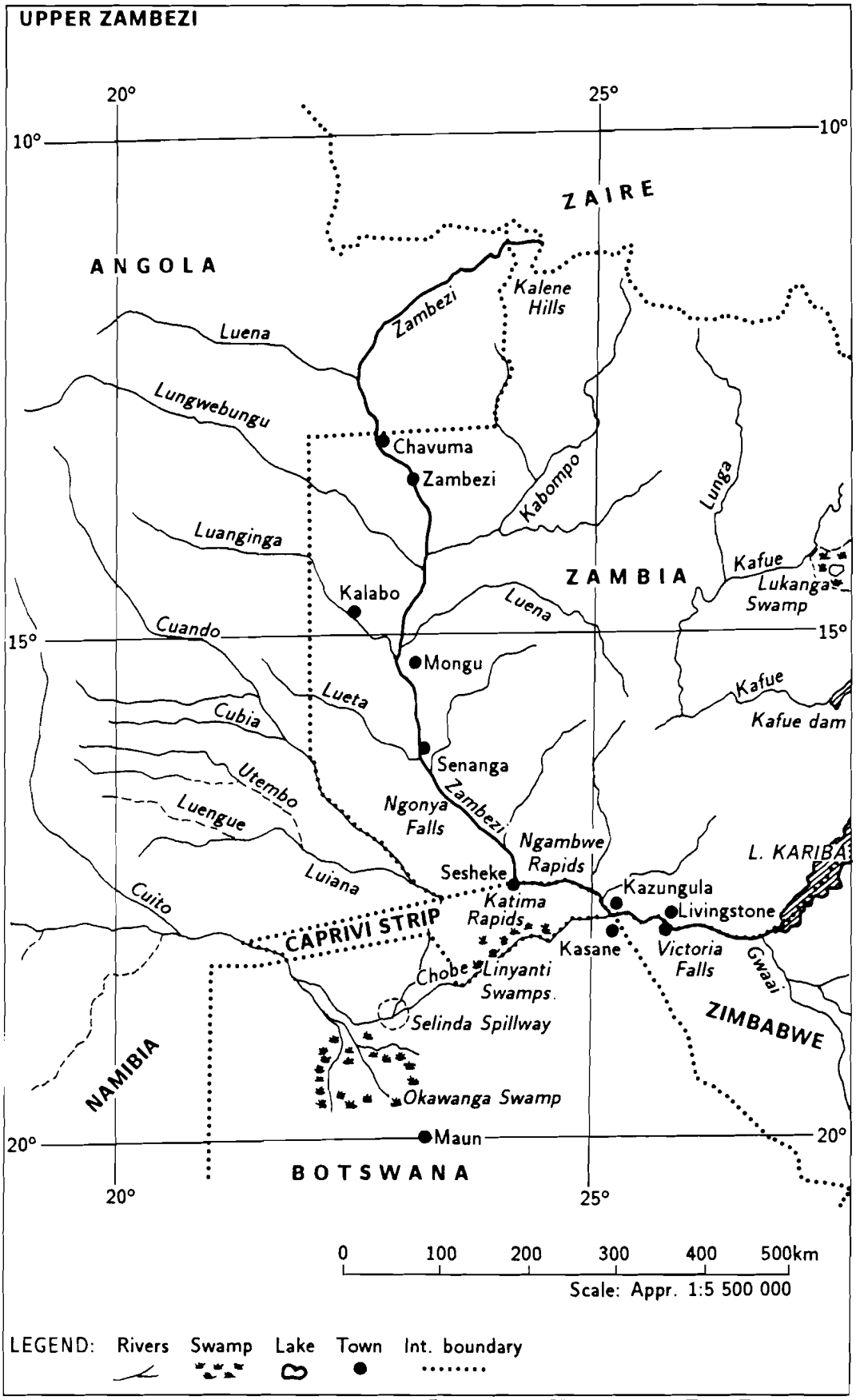
*Table 1.*Population and area distribution – 1983.

Countries	Total area km^2	Basin area			Total population	Basin population		
		km^2	% of country area	% of basin area			% of country population	% of total basin population
Angola	1,246,700	145,000	11.6	10.9	8,206,080	303,740	3.7	1.45
Botswana	582,000	84,000	14.4	6.3	998,000	8,100	0.8	0.05
Namibia	824,269	24,000	2.9	1.8	1,088,000	40,010	3.7	0.20
Zambia	752,614	540,000	71.6	40.6	6,255,000	4,391,000	70.2	21.50
Zimbabwe	390,759	251,411	64.3	18.9	7,822,000	5,639,035	72.1	27.60
Mozambique	799,380	140,000	17.5	10.5	13,345,000	2,566,708	19.2	12.60
Malawi	118,484	118,484	100	8.9	6,670,000	6,670,000	100	32.60
Tanzania	945,087	27,105	2.9	1.1	20,410,000	815,420	4.0	4.00
Total	5,659,293	1,330,000	23.5	100	64,794,080	20,434,013	31.5	100

Source – The World Bank Atlas – 1985 in the UNEP Diagnostic Study – 1986

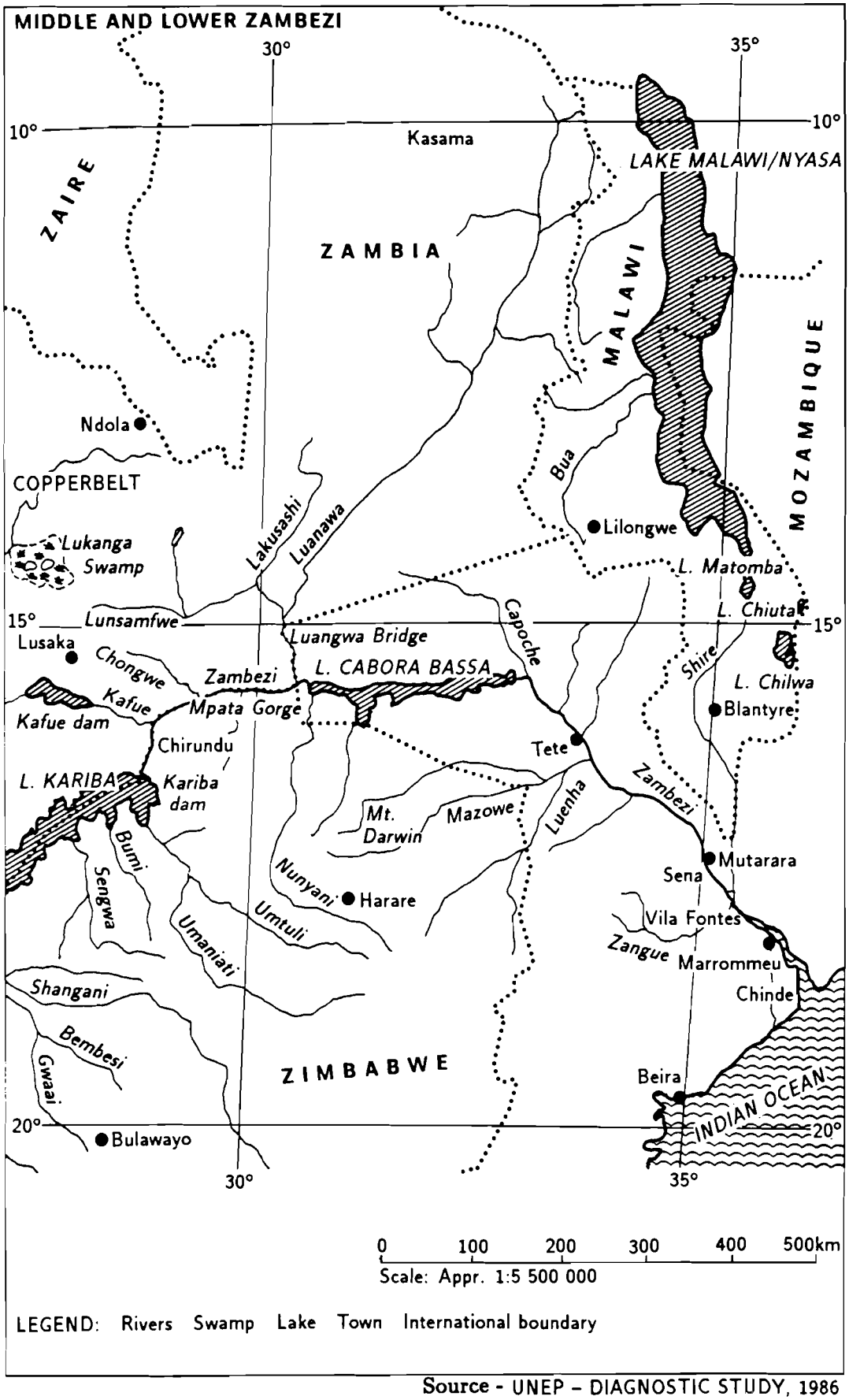
The importance of the Zambezi basin is mainly related to rural activities. More than 70% of the population living in the drainage area of the basin is involved in agriculture. Major pollution problems do not exist yet, with the exception of some specific areas, especially around main urban centers.

However, there is a tendency to expand cultivated land in the Zambezi drainage basin as a result of the increasing demand for food in the riparian countries. New agricultural programs are being implemented and imply more use of water for irrigation, as well as an increase in the use of artificial fertilizers. Two other factors connected to the expansion of the cultivated land are also affecting conditions in the basin considerably: deforestation, with direct consequences on the flows of the basin; and eradication of the tsetse fly with the use of DDT. Furthermore, an intensification of the use of the Zambezi basin for energy generation is also very likely to occur in the next two decades as a result of the increasing demand for energy in the region. All this aspects will be discussed further in this paper.



Source - UNEP – DIAGNOSTIC STUDY, 1986

Map 2.



Source - UNEP – DIAGNOSTIC STUDY, 1986

Map 3.

3. How Should the Issues be Identified?

The development of the Zambezi Basin cannot be completely understood if analyzed only as a water-management issue. The problems should be studied from a wider perspective and in the global context. For sustainable development of the resources that the basin has to offer, a consensus has to be attained not only in the various levels of the Southern African context but also, to a certain extent, on the international level.

First, the position of Southern Africa in the world has to be better understood. How do the Southern African countries relate to the industrialized countries politically and economically? What is their importance in the economic and political system existing in the world today, and what is their position or role in the process of change that this system is now undergoing?

Second, we have to understand the internal organization of Southern Africa. The cultural backgrounds have many special features that many times are ignored by analysts. Moreover, countries which have only recently become independent, working their way out of racial systems and economic control of rich western nations, are undergoing a process of hierarchical organization. The local structure of political and economic power is not completely determined in Africa yet. This means that the interrelation of the African countries among themselves is different from the relations among countries that have already solved their questions of territorial sovereignty and that have reached political stability many years earlier. Understanding these internal relations is crucial for the development of any decision support system for managing international problems in the region.

Third, some peculiarities of each of the riparian countries have to be clarified, and some differences in their internal organization identified. This is important for the specification of the problems that have to be faced in the process of joining forces for the management of a common basin.

Only after such analysis has been carried out can the implications involved in the development of the Zambezi basin be well determined and policies for a co-operative management of the basin be suggested. These policies can finally be implemented, and the existing limitations be effectively dealt with.

Such a study is quite complex and extensive, though of great importance. On the other hand, this kind of analysis is quite difficult because of the lack of basic information about African countries which hampers a better comprehension of the real situation presently found in each of them. For instance, the last census in most of the Southern African countries was done during the sixties or the beginning of the seventies, which does not permit more than only a very rough estimation of the present features of population, growth rate, their distribution and internal migration. Considering the Zambezi basin, there is shortage of basic information that is essential for an in-depth analysis of the various aspects of the basin. For that reason, statistical values were mostly avoided in this paper.

Mainly two of the levels of analysis mentioned above will be discussed here: (1) the regional political organization of the Zambezi Basin Countries and, (2) some internal peculiarities found in each of them, especially those which have more direct implication in the development of the Zambezi basin. The first level, that is, the position of the ZBC in relation to industrialized nations, will only be briefly tackled here, since the subject can be controversial in some aspects, as well as very extensive.

Since the actual data and knowledge that are available about Southern Africa in general is still insufficient, many of the existing studies are very superficial and partial, emphasizing the special interest of certain groups or nations. The cultural and social structures of the countries tend to be analyzed from a western perspective, and problems tend to be generalized. The lack of fundamental information hinders the generation of effective solutions for the African problems. Since these problems are already very serious and call for urgent solutions, there may not be time to collect all the necessary basic data

before corrective measures start to be adopted. Only through active scientific exploration can new and different approaches to these problems evolve which will eventually lead to their resolution.

Moreover, it is also essential that all the countries have access to information of methods which permit a better management of their problems. Policy exercises may be an efficient way for collecting as well as spreading information among policy makers, scientists and public. This technique may also be used for exchanging ideas and generating new options for development.

4. What Characterizes the Zambezi Basin Countries (ZBC)?

The ZBC have many features in common such as:

* a long-lasting colonial past that ended only recently;
* "primary" activities as the dominating sector of the economy;
* fast growing population;
* wide gap between poor and rich segments of the society;
* little or no participation of the population in political decisions and public matters in general;
* great desire for development.

These similarities can serve as the basis for a definition of some general regional policies in Southern Africa. These same factors form the initial scenario in which policies for management of the Zambezi basin have to be considered.

However, the lack of data available about the Southern African countries usually leads scientists to make many generalizations, which gives the mistaken impression that the problems of the various countries sharing the Zambezi basin are the same. The consequence is the adoption of conventional policies rather than the generation of new ideas, which would demand greater changes in the approach of these countries' problems, and, certainly, a different attitude from those who have interests to share in the region.

Notwithstanding their common problems and comparable interests, each of the ZBC presents many distinctive characteristics such as:

* different ethnic composition of the population;
* varied historical and cultural background;
* diversity in the government's ideology and its degree of stability;
* variety of natural resources available in the country;
* diverse degree of economic development.

Such differences are, many times, cause of conflicts, which can create barriers or undermine potential regional economic development. Only if the conflicting interests are well defined, can the possibilities for combining them into common policies for development be distinguished.

It may even be so that apparently joint interests turn out to be contrasting goals. For example, the perception of what development is and how it should be achieved can vary from country to country. The tendency to use the same methods applied in the western societies for developing the ZBC reduces the chances of establishing new dynamics in the Southern African region, based on the peculiarities of their cultural and social structure, which could even imply less damage to the natural environment.

4.1. Historical and political aspects

The present political situation of the ZBC has to be analyzed in a historical context for a better comprehension of its features. One of the reasons why the ZBC are lagging behind in the global context of development is due to their recent colonial past. The development promoted in the colonies mainly envisioned gains for the parent state, as is usual in colonial systems. Coastal towns grew quickly because of their direct contact with Europe, disrupting internal links that existed in the continent before the colonial times. The internal fragmentation of the society was advantageous for the dominating nations since it weakened movements for liberation.

The ZBC became independent only very recently and are still undergoing a process of internal political and economic organization. Once independent, the nations had to develop their own internal structure, creating the mechanisms and the organizations necessary to administrate the different sectors of national activities. In some cases, the apparatuses that originated in colonial times were kept in their initial form, or were adapted to the new conditions; in other cases, they were nonexistent and had to be created. For this reason, the institutional structure of the countries is not yet completely defined and, therefore, is still unstable in many sectors.

In some countries, the process of independence created barriers both between the colony and parent state, and between neighboring nations. This happened either because the transference of power from the parent state to the colony was not achieved through peaceful negotiation, as was the case in Angola and Mozambique with Portugal, or because liberation groups supported by neighboring countries did not become the ruling party when independence was achieved, as in the case of Angola with the Republic of South Africa. These factors, along with the difference in the ideology of the various ZBC, are the cause of some of the conflicts in the region.

The boundaries determined during colonial times are basically accepted by the ZBC, although they do not consider the distribution of the different ethnic groups. However, some border conflicts and claims still exist in the area, as will be shown later in this paper.

The fragmented social and economic structure of the ZBC hinders national integration, which permits the emergence of opposing groups, often supported by other nations. Such a situation creates new disputes among the countries and, consequently, increase instability in the region. In asking for help to resolve these disputes, governments attract international conflicts of foreign superpowers to their territories, since the presence of one superpower motivates the presence of another, which wants to guarantee its interests in the region (Legum, 1979). This situation exacerbates the conflicts among the ZBC countries because of the greater risks of long-lasting armed confrontations. Such conditions are not only unfavorable for Africa but also for global political stability. Moreover, the militarization of the ZBC drains scarce resources that are essential for their development.

To stop such a process of transference of conflicts from the northern hemisphere to the African continent is a complex task. Some ZBC, like Tanzania, for example, have openly expressed their position against any kind of foreign intervention in domestic and regional disputes in the region, but political and economic instability makes the enforcement of such a position difficult. In any case, reaction against foreign influence in Africa has already emerged from internal forces in the continent, and tends to grow stronger. As a result, the Organization of African Unity was created in the early sixties to unify African countries' efforts to decolonize the continent, and to work against foreign interference in African internal affairs.

On the national level, the governments of the ZBC are presently working on the unification of the interests of the different groups of their society, in order to obtain consensus for their purposes of development and, consequently, attain more stability. The presence of authoritarian regimes in the ZBC can be seen as a stage in the process of pol-

itical maturation, since the ZBC did not inherit a tradition of public political participation. This is a serious constraint since citizen participation in the decision-making processes is argued to be an essential prerequisite for a sustainable development.

4.2. Population

The rapid growth of the ZBC population is alarming. Most ZBC are large countries which still have low population densities when compared to countries in Europe or with other Third World countries (see table 1). Botswana, for example, is slightly larger than France, and has a population calculated at 1,100,000 inhabitants compared to 55,400,000 in France. Malawi, the smallest of the ZBC and the one with highest density, is about the size of Czechoslovakia, and has a population which is only half as large.

However, the annual growth rate of the population of most of the ZBC exceeds 3.0%. This means that the already serious social and economic problems existing in the ZBC will turn into a catastrophe if serious policies are not adopted both to slow down population growth, and to activate the various segments of the economy in order to improve living standards. The latter is, however, the most essential.

The geographical distribution of the population in the ZBC varies substantially, but the majority of the population is still living in rural areas. There is considerable spatial mobility inside and among the countries, influenced by historical and social factors, both of economic and noneconomic dimension. Unfortunately, not enough is known about the present patterns, directions and motivations of migration in these countries. Despite the large rural population, most investments tend to be applied to cities, emphasizing industrialization. The diversity of the urban environment, allied to the poor conditions of the rural areas, continue to attract people to the cities. This situation aggravates the disparity between the urban and the rural realities of Southern Africa.

Rural-to-urban migration is quickly developing, and is the most evident of the population movements in the region. The main migration movements of the African population are, however, of the rural-to-rural type, which is logical considering the rural base of the population (Adepoju, 1981). Some of these movements are due to the degradation of natural resources. A better comprehension of the migration streams is important for designing policies that either counteract the inadvisable movements or integrate them into the development strategies.

A change in the focus of the development areas, with more investments in the rural areas and small communities in order to improve the quality of rural life, will help reverse migration flows and create the essential basis for a more consistent development. Some countries are already trying to adopt such policies as, for example, Zimbabwe.

4.3. Economic factors

The pressures to integrate the ZBC in the international economic system aggravate the serious problems that these countries already have to face. The economic structure of most of the ZBC has not yet generated all the mechanisms necessary for a complete integration into the market oriented modes of economy. Some authors believe that internal forces will lead African countries to develop their economy more independently of the international economic system, although this transition may imply high costs in the short run.

In fact, in their struggle for decolonization, some ZBC have tried to break economic links established during colonial times. Parent states, however, press for the maintenance of the previous links in order to guarantee their economic interests. These relations are

usually supported by a small prosperous segment of the society, which represents an internal barrier for peripheral social groups to be integrated in the production system, or for the creation of a new economic order.

For the design of any program of development for the ZBC, the particular features of the economic structure of the region and of each country by itself has to be better understood. The behavior of the western economic models should not be used to analyze such features. The generation and movements of capital inside the ZBC, the characteristics of the labor market, and other features of the region's economy differ from other regions of the world in many aspects. The peculiarities of the ZBC call for a different approach of the problems to be tackled and for creative measures able to give a new impulse to the economy of these countries.

Moreover, the different demands of the various regions have to be recognized and evaluated even inside the same country. These differences exist not only because of geographical variations but also because of the diversity of the ethnic groups found in each country. The new policies adopted, and the way new technologies are introduced in the various communities can, therefore, vary widely. Since most of the ZBC have a very heterogeneous population, and arbitrary borders defined in colonial times separate groups of the same ethnic origin, this factor is particularly important. The ethnic differences affect both the national and the regional scenario, since loyalty to the ethnic groups is, in many cases, stronger than nationalism.

One of the main problems that has to be faced by the ZBC is the question of energy. Fuelwood is still the most important source of energy in Southern African countries, especially for domestic purposes. The intensive use of wood, and more recently of dung, a natural cover that serves as soil fertilizer, is eliminating forests entirely, as well as damaging soil potentially good for agriculture. Environmental degradation undermines economic development, worsening the already very bad conditions of life of entire populations in Africa.

It is very probable that fuelwood will continue to play an important role in most of Southern Africa for upcoming decades. Meanwhile, small-scale technologies for producing energy for domestic use should be introduced in rural areas. Such a task is not easy to accomplish since it involves breaking with traditional types of energy production, which implies careful implementation programs at the local level. The technologies needed are those that can easily be introduced on a small-scale rather than on a large-scale; solutions must be "sophisticated in their conception, simple in their application" (Makhijani, 1980).

However, waterpower is the largest potential power source in the ZBC. Consequently, an intensification of the use of the Zambezi basin for energy generation is very likely to occur in the next two decades as a result of the increasing demand for energy in these countries.

5. Specific Aspects of the Zambezi Basin Countries

5.1. Angola

The Zambezi river enters the northeastern part of Angola just downstream from its source. Leaving Angola, the Zambezi river enters Zambia. In the eastern part of the country, many rivers flow into the Zambezi River; others, like the Cubango, drain into the Lake Ngami in Botswana, also part of the Zambezi basin. The Cuando river forms part of the border with Zambia, and the Okavango river forms part of the border with Namibia.

Angola is underpopulated. The ethnic majority of the population is of Bantu stock. Since independence, the white communities have been sharply reduced. The country does not have any official program for birth control and the population's growth rate is es-

timated at 2.5%.

Although Angola has a total of 3,220 km of navigable rivers, these rivers usually do not favor migration from the coast to the interior of the country. River transport is underdeveloped and the internal road system is also inadequate. Consequently, the highest densities are on the coast. The lowest are in the southeastern parts, which are drained by tributaries of the Zambezi River. The province of Cuando-Cubango has the lowest density of the country.

The economy of the country is very diversified. Angola is one of the richest countries in Southern Africa. The main export product is oil but the country still has a variety of products such as diamonds, iron ore and copper. Fish products are also important for exports, but fisheries are mainly concentrated in a few centers on the coast.

The large extensions of cultivable land and the climatic characteristics in Angola are exceptionally favorable for agricultural development, but the percentage of cultivated land is only 3%. Urbanization is increasing quickly but at least 80% of the population is still rural.

Relations between Angola and South Africa have been seriously affected by the presence of the Cuban troops as well as by South Africa's support to Angola's government opposition party UNITA. Negotiations between the two countries are presently coming to favorable results.

Cuba, the Soviet Union and East European countries became more important as trade partners after independence. However, because of the need for foreign investments to promote development, private property was not totally eliminated, and many countries such as Portugal, Denmark, United States, West Germany and Austria still have substantial investment interests in Angola.

Since there are no special population pressures in Angola, the southern regions of the country do not attract much attention from the national authorities, and policies to develop this area are not likely to come in the short run. Presently, there are no serious border disputes in Angola, although Zaire has claimed the Cabinda enclave.

5.2. Botswana

Most of Botswana does not have any surface drainage. The country suffers many times from droughts that can last up to five years. Only 2% of the country is under cultivation and the most common method of irrigation utilizes underground water reserves.

The major interior river system is the Okavango which flows into Botswana from the Angolan Highlands and is part of the Zambezi basin. The Okavango River forms the Okavango Swamps, which fills Lake Ngami and, together with the Botletle River, nourishes Lake Dow and the Makgadikgadi Salt Plains.

The Okavango River is subject to intensive exploitation since it is the major river in Botswana. There is large-scale cattle raising in the Okavango delta, and there are plans to develop agricultural programs in this area using large-scale irrigation. Fishing is also carried on in the Okavango River Delta and swamps as well as in the Chobe River.

The Chobe River marks the border of the Caprivi Strip, Namibia, and flows into the Zambezi River. This area is a source of controversy with South Africa, which would like to build a 1,340 kilometer-long canal to divert the Zambezi in order to alleviate drought in the northern Province of Transvaal, and provide new water supplies for the country. Such a project would seriously affect the fishing and power supplies of Mozambique, Zimbabwe and Zambia, as well as cause many ecological impacts in the region, which are difficult to completely evaluate.

The highest population densities in Botswana are found in the eastern part of the central plateau. Approximately 80% of the population lives in this area. Urbanization is developing at an exceptional rate of 16% and is mainly concentrated along the railway that runs from north to south of the country. There are family planning programs in the country but the target is only to reduce population growth from 3.6% to 2.5%.

Botswana has a significant non-African population which plays an active political and economic role in the country. The principal economic activity is cattle raising. The main mineral resources are diamonds and nickel-copper deposits located in the northeast.

Despite condemning apartheid, the country has adopted a moderate policy toward South Africa which is an important trading partner, as well as a source of employment for the Tswana. Until 1976, Botswana used the monetary system of the Republic of South Africa. Only then, did the country create its own system. There are, however, no formal diplomatic relations between Botswana and South Africa.

Although relations with the United Kingdom and other Western nations are cordial, the country also has diplomatic relations with the Soviet Union, China, North Korea and nations from the Eastern Europe. In Southern Africa, Botswana has very good relations with Tanzania and Zambia.

The country's government is one of the most stable in Africa, which has contributed to impressive economic growth during the last years. However, Botwana is still among the least developed countries in the world.

5.3. Malawi

In 1968, Malawi claimed territories from all its bordering countries: Tanzania, Mozambique and Zambia. In the three cases the areas claimed are drained by the Zambezi basin. However, the claims were never pressed.

Lake Malawi is the most prominent feature in the country's geography. Eight rivers and other hundreds of streams flow into Lake Malawi. The lake is drained by the Lake Malombe in the south, and by the Shire River, which flow into the Zambezi River in Mozambique. Other catchments join the Shire Valley. The country's main fishing areas are Lakes Malawi, Malombe and Chilwe, and the Shire River, all possessing substantial fishing potential. Limbe is the main center for fish trade. Inland waterways include Lake Malawi (1,290 km in length) and the Shire River (144 km).

Malawi has one of the highest population densities in the whole of Africa. The density is highest in the south and lowest in the northern region. The annual growth rate is 2.6% and the official policy of the country is pro-natalist. Very limited family planning facilities are available. The rapid population growth already creates problems because of the existing pressures both in urban areas and in rural available land. There is preference for the southern region, and one of the largest of the agricultural programs is in the Shire Valley.

Although 99.5% of the population is African, it is ethnically divided into numerous groups. Inter-ethnic relations are becoming more and more common and, consequently, ethnicity has declined in importance. New alignments tend to depend more on regional, political or religious circumstances.

Like Botswana, Malawi is also among the poorest countries in the world. Almost 100% of the exports are from the agricultural sector. Expansion of cattle raising is difficult because of the presence of the tsetse fly and because of the pressure on land for cultivation. The country has no reserves of commercially valuable minerals.

The economy of the country is very dependent on the remittances from workers living in Zimbabwe and South Africa. Labor is Malawi's third largest export. A break in relations with any of these countries would bring very serious problems to the development

of Malawi. Although Malawi does not sympathize with the Marxists who rule Mozambique, it depends on Mozambique as its only outlet to the sea.

The moderation that characterized the independence of the country contributed to the maintenance of good relations between Malawi, the United Kingdom and South Africa. British civil servants occupy many key positions and British interests still dominate the modern sectors of the economy. Before the independence of Mozambique, the country also had close relations with the Portuguese government. Because of these relations, and mainly because of its relation with the Republic of South Africa, Malawi is very unpopular among neighboring countries.

5.4. Mozambique

The Zambezi River divides Mozambique in two halves, and is the largest of the five major river systems draining the country. From a total length of 820 km within Mozambique, 460 km of the Zambezi are navigable. At Songo, in the western part of the country, the river is the site of the Cabora Bassa Dam, one of the largest in the world. In the northwest, Mozambique shares Lake Malawi with Malawi and Tanzania.

The ethnic formation of the population has not been thoroughly studied in Mozambique up to this time, but ten main groups have been identified. Mozambique does not have any official policies for birth control. There are no records of the number of Mozambicans working in neighboring countries, but a great number goes to South Africa.

The urban population of Mozambique is estimated at 10% and the higher densities are in the provinces of Maputo and Nampula; the lowest are around Lake Malawi and the Cabora Bassa Dam. The lower parts of the Zambezi basin are fairly well populated.

Nearly 70% of the country lies within the tsetse zone. Therefore, cattle are raised mainly south of the Save River. Goats, sheep and swine are raised throughout the country. Of the total land area, 60% is classified as cultivable, but only approximately 6,5% is under cultivation. The area drained by the Zambezi basin has great agricultural potential. Irrigation projects exist in this area, including the region around the Cabora Bassa Dam.

Fishing is not highly developed in Mozambique. The main potential is in the Indian Ocean and in Lake Malawi. The transportation system is the best-developed sector of the economy, servicing not only domestic needs but also the country's landlocked neighbors: Malawi, Zambia, Zimbabwe and Swaziland as well as South Africa. Mozambique has many mineral resources such as coal, bauxite, tantalite and precious stones.

Because of the length of the struggle for independence, present relations between Portugal and Mozambique are hostile. Foreign relations are organized according to the country's Marxist ideology, and its struggle against colonialism. The adoption of a Marxist orientation has caused an exodus of western residents.

Relations with South Africa are a major concern because they involve economic compromises established during colonial times, such as the Cabora Bassa Dam, which was financed by South Africa in return for a contract for 80% of its electric power output. The importance of South Africa as a labor market for Mozambicans, and links from the interior to Mozambique's ports are also important issues between the two countries.

Friendly relations in the region are carried out with Tanzania, Zambia, Botswana and Angola. Despite the difference in ideology between Mozambique and Tanzania, the two countries have been working to establish close ties. This friendship is due to Tanzania's support to FRELIMO, the government party. Mozambique has close historical ties with Angola, since both were Portuguese colonies. Relations with Malawi are not very friendly because of the latter's pro-Portuguese and pro-Western policy. Mozambique also has good relations with the Soviet Union and China. Among Western nations only Sweden is well regarded.

5.5. Namibia

South Africa's direct rule in Namibia ended officially on June 17, 1985. However, the administration established then only had limited power: The Republic of South Africa retained the right of effective veto over the government's decisions. The Republic of South Africa remained also responsible for the territory's defense and foreign policy. Pressure for the effective independence of Namibia has come from different sources but has continuously been resisted by South Africa, which, among other things, kept connecting the implementation of the United Nations plan for the independence of Namibia to the withdrawal of Cuban troops from Angola. Angola, in its turn, insisted that Cuban troops would remain at full strength in its territory until the complete independence of Namibia. Negotiations have been taking place among South Africa and Angola for quite a long time and have apparently reached positive results during the last few months. How agreements are going to be carried out remains to be seen.

Namibia's land is mostly desert, with the exception of the interior plateau and the area along the northern border. As a result, the scarce water resources have to be intensively exploited. The country is underpopulated, with densities being even lower than in Botswana. The population is mainly rural, but the country is still very dependent on food import.

Natural resources are abundant in Namibia and contribute to most export revenues. The most important minerals are diamonds, copper, lead and zinc. The country also has livestock raising, especially cattle and sheep. Fishing is mainly developed in the South African enclave of Walvis Bay. The main trading partner is South Africa, which is also the only donor of aid.

5.6. Tanzania

There are no large rivers in Tanzania but the country is part of the three great river systems of the African continent: the Nile, the Zaire and the Zambezi. The main basin inside the country is the River Rufiji, which covers one-forth of the national territory. On the borders there are three large lakes: Victoria in the north, Tanganyika in the west and Malawi in the south. Most of the fishing activities are carried out in the lakes. Two rivers flow into Lake Malawi: the Songwe and the Ruhuhu. The region around Lake Malawi is the only case of a boundary dispute in Tanzania during the last years.

The greatest part of the population in Tanzania is concentrated in the north of the country. The area around Lake Victoria has one-fourth of the total population. The country is among the least urbanized in the world. Population growth is around 3.5% and the country has no official policy for birth control. Activities of the private Family Planning Association are, however, encouraged by the state.

Tanzania is probably the least homogeneous country in the world considering the ethnic formation of the population. Africans constitute 99% of the total population and are divided into over 130 different groups, speaking more than 100 languages. Other groups are from Asian, Arab or European origin. Despite their limited number and the policies for Africanisation adopted by the government, these groups have very strong cultural and economic influence in the country. Contrasting with its heterogeneous ethnic formation, Tanzania is one of the most stable nations in Africa.

The presence of the tsetse fly and the irregular distribution of rainfall in some areas restrict the use of land in Tanzania. However, approximately 60% of the land is cultivable. Forests cover approximately 30% of the country. Most tribes practice subsistence farming but crops are increasing in the more fertile areas. More than 90% of the labor force is employed in agriculture. In 1970 the government began a rural program forming communal villages, with the intent of raising rural standards of living as well as agricul-

tural production. There have also been attempts to develop more cattle raising.

Industry is mainly based on the manufacture of agricultural products and is concentrated in the northern parts of the country. This sector has received great investments during the last years. Diamond mining is also of economic importance. Other resources such as coal and iron exist but are still unexploited.

Tanzania has a socialist orientation but many incentives are given for foreign investments in the country. The government has adopted an ideology toward Africanisation but the skilled labor force is still scarce and consisted of a large number of Europeans and Asians.

Tanzania maintains close relations with Zambia. Relations with Mozambique are also close because of Tanzania's support to liberation movements in the former before independence. Malawi's relations with South Africa and the border disputes around the river Songwe have impaired relations between Malawi and Tanzania.

American policies in Africa are publicly criticized in Tanzania. The major source of aid in the country is China and its influence in Tanzania is the strongest in Southern Africa. Cuban technicians in the region are also in large number.

5.7. Zambia

Zambia's main drainage system is the Zambezi River with its three major tributaries, the Kabompo, the Kafue and the Luangwa Rivers. Except for the border with Zimbabwe, which follows the Zambezi River and Lake Kariba, most of the borders are arbitrary lines determined in colonial times. There are, however, no current border disputes.

Nearly 98.7% of Zambians are Africans belonging to more than 70 Bantu-speaking tribes. Tribal affiliations are often fluid and modified through assimilation and migration. Although tribal divisions no longer have political significance, tribal loyalties and prejudices remain powerful determinants of social and political attitudes. Official policy toward family planning is positive. The non-African component of the population has been declining since independence as a result of the growing emphasis on Zambianisation of the economy.

One-third of the population lives along what is known as the line-of-rail belt in the central high-lands, in the adjacent area, and in the Copperbelt. Population is also dense in the Mozambique and Malawi border areas in the southeast, in the Lake Bangweulu-Luapula complex of swamps and islands in the northern region and in the flats of the Zambezi River in the western part of the country. In contrast, the Luangwa Valley in the southeast, comprising 10% of the national territory, is virtually unpopulated.

The large-scale commercial farms are concentrated between Livingstone and Kabwe. Otherwise, agriculture is basically characterized by subsistence farming. Of the total land area, 5% is cultivated, an additional 5% is considered arable, and another 40% is considered potentially cultivable. Cattle production is limited.

Fishing is carried on in the major lakes and in the upper Zambezi and Bangweulu-Luapula basins mostly as subsistence occupation by part-time and full-time fishermen. Inland waterways include both the Zambezi and other rivers and the three lakes.

Although manufacturing constitutes the largest economic sector, Zambia is also rich in natural resources, such as coal, petroleum and copper. The copper-ore reserves of the country are among the richest in the world.

Zambia has played a key role in the movement toward ethnic group majority rule in southern African countries, consistently supporting African liberation movements of neighboring countries. However, the country has displayed considerable moderation and shown no desire to break completely with the colonial past. Zambia continues to look to

the United Kingdom for economic and political support, and basic ties remain strong.

Zambia and South Africa have come close to open confrontation a number of times over the use of Zambian territory by Namibian guerrillas. Relations with Malawi have been strained by the latter's policy of maintaining trade and diplomatic relations with South Africa.

Relations with the government in Angola continue to be strained because of Zambian support to the pro-Western faction, UNITA. On the other hand, relations with Mozambique are very close; a permanent commission has been established to promote mutual cooperation. Zambia's strongest fraternal ties are with Tanzania because of their common colonial traditions and common views on African and world problems.

Of the many countries outside Africa with which Zambia has diplomatic relations, the United Kingdom, China and the United States are of major significance. Relations with China are primarily economic.

5.8. Zimbabwe

Zimbabwe has an important position in southern Africa: economically, it is the strongest among the southern African countries. It is the youngest independent nation in Africa, but its economy was already well established during the years of colonization. Compared to other African nations, the country has a well-developed infrastructure and a good industrial basis.

Because of Zimbabwe's pace of development, there is pressing need for intensive exploitation of the water resources available. They consist mainly of the Zambezi River, which defines the whole extension of the border between Zimbabwe and Zambia, and the Limpopo and Sabi-Lundi basins in the south and south-east. The Zambezi is the site of one of the largest hydroelectric power plants in the world, the Kariba Dam, the principal source of electricity in Zimbabwe. The government has started work on a rural water supply and sanitation program which will also use groundwater resources.

The eastern part of the country is the most populated, and the extreme west and south are the least populated. Northern parts of the country also remain sparsely populated, while communal lands suffer from overpopulation. Population growth is believed to be around 3% a year and there is official concern about this rate.

Zimbabwe's farms are among Africa's best, often providing surpluses. White large-scale farmers produce the majority of the exported products but black farmers, which were excluded from sales of some products during white rule, are increasing their commercial participation. Their share of agricultural output has risen from 9% in 1983 to 15% in 1984, and to 20% in 1985. The black population's role is also increasing in other sectors such as cattle raising production.

Zimbabwe has many mineral resources such as gold, asbestos, coal, copper, chrome and nickel. The country produces more than 40 different minerals but no oil deposits have been found.

The economic dependence of Zimbabwe on the Republic of South Africa is the cause of serious conflicts between the two nations, since Zimbabwe voices official opposition to South Africa's apartheid regime. The government of Zimbabwe has advocated the imposition of many economic sanctions against the Republic of South Africa, which also brought the country in conflict with Britain and the USA. In retaliation to Zimbabwe's position, South Africa gives support to the guerrilla group in Mozambique, RENAMO, which threatens Zimbabwe's route to the sea. Therefore, Zimbabwe provides military assistance to the government of Mozambique in order to protect the Beira corridor, vital for its economy.

Agreements on economic and technical co-operation have been signed with China and the Soviet Union. An agreement was also signed with Malawi for trade and general co-operation. Despite its Marxist rhetoric, the country adopted initial moderate policies, maintaining stability. Therefore, Zimbabwe's economic prognosis is exceptionally good, which tends to attract many investments to the country.

6. How to Proceed on the Development of the Zambezi Basin?

The development of a decision-support system for managing the Zambezi basin can be of great help for the ZBC. However, it has to be designed with participation of the various ZBC. This also implies training people to make the best possible use of the decision-support system. The lack of professionals with the necessary training to operate sophisticated tools, as well as the lack of technical equipment and materials, is one of the most direct limitations that has to be overcome. Moreover, such a decision-support system has to be flexible in order to be easily adapted to the different conditions and needs of the various ZBC.

Efforts exist from the ZBC for pursuing joint work for better results in the development of the Zambezi basin, but basic consensus has not been reached yet. The early stage of exploitation found in the Zambezi basin today, allied to the lack of basic essential information considering the basin, is seen by some as being an advantage for initial agreements between the various ZBC. However, this advantage only exists while basic concerns at the biophysical level are shared. Further discussions are biased by lack of basic information which makes it difficult to validate opposing arguments and policies. Moreover, some governments may choose to invest in alternatives considered more urgent in their countries, and that would result in better national recognition, rather than get involved in international projects that do not bring considerable benefits in the short run. For example, how much is Angola's government willing to invest in studies or negotiations concerning the Zambezi basin, when the region drained by this basin has the lowest population densities of the country?

Given that the problems found in the Zambezi basin are partly common to all the countries sharing the basin, and partly diverse and specific, joint policies on the regional level are essential for giving directives to national programs and for guarantying a sustainable development of the basin. Once the directives and policies for regional development of the Zambezi basin are determined, each country can work out its own social policies according to the needs of its populations.

Unfortunately, even if the adoption of joint policies in the development of transboundary basins is imperative in the scientists' eyes, this necessity does not seem to be as obvious for politicians and investors. Presently, coordination between the programs implemented by each ZBC is still poor. There exist plans for joint actions in the basin but political differences and the lack of understanding of the various levels of problems of one another impose limitations on the elaboration of such plans. Because of the large dimensions of the questions involved in the development of the Zambezi basin, there may not be time to collect all the necessary basic data before measures start to be adopted. For that reason, a more open method for joint discussion of common problems and for the generation of solutions for these problems should be considered. This will not diminish the importance of producing more data, let alone replace any kind of information. The idea is to adopt policies that can easily be re-adapted to new situations, or improved as more information is obtained.

Policy exercises can be a useful tool for discussing the development of the Zambezi basin. Policy exercises can contribute to real interaction between the various riparian countries, and help detect conflicting as well as common interests. Still, in order to be an

interesting alternative in this context, the mechanisms used in policy exercises have to be adapted to this specific case.

There is also another reason for the use of policy exercises in the Zambezi case that has to be mentioned here. The present technological development that the world is undergoing is providing scientists and decision-makers with new tools for understanding and managing the environment. It is important that these tools be used to improve relations between humankind and nature. Computer models, for example, have become an important element in studies of environmental behavior. They can provide information about impacts of exploitation of natural resources, quantify economic costs, gains and losses, optimize results etc. Simulations not only save time, but are usually also less costly when the experiences are controversial.

However, the introduction of sophisticated tools in the decision making process continues to find barriers. If not used accordingly, computer models may be more of an obstacle rather than an aid in policy making, hindering creative and innovative ideas. Moreover, if these tools have a much too high level of complexity and are not easily accessible to policy makers, they will only contribute to widen up the distance between science and policy. In negotiations in which some parties have access to such tools and others do not, a feeling of mistrust can arise.

Policy exercises create a propitious forum for introducing sophisticated methods of problem analysis into the decision making process. In developing countries other practical barriers, like scarce economic resources and lack of trained professionals, represent hindrances for the acquisition and use of such tools and methods. Despite these difficulties, it is important that the new technological processes of problem resolution be introduced also in developing countries, so that they can benefit directly from them, finding their own solutions to their problems.

7. Main Issues in the Management of the Zambezi Basin

Presently, the problems concerning the Zambezi basin are not extremely serious, with the exception of some specific areas, most of them around main urban centers. However, there is no doubt that economic development in the ZBC will imply a very intensive use of the Zambezi basin, especially in the case of some countries which are mainly dependent on this basin. The present dependence on the importation of large amounts of foodstuffs in some ZBC, allied to their quick population growth call for a considerable increase in agricultural productivity.

In fact, programs allocating more investments to rural areas have already been designed and are being carried out in some of the ZBC in order to improve the quality of life in the rural areas and to avoid more population influx to the cities. Unfortunately, coordination between the programs implemented by each country is still poor. Moreover, in some cases, the kind of land-use system existing in the countries can be a barrier for national integration: some tribes, for example, have absolute right over their land.

There is an increasing use of fertilizers in modern farming, which is polluting the Zambezi basin. However, contrary to the situation in some other developing countries, agricultural productivity can be improved in most ZBC with expansion of arable land. Therefore, intensive use of fertilizers in crops should be considered carefully, although more irrigation may be essential. On the other hand, the presence of the tsetse fly imposes constraints for the occupation of some areas. Presently, eradication is carried out basically with DDT, which is very harmful to the environment.

As a result of the increasing demand for food, fishing activities will also be intensified in the Zambezi basin. Currently, with the exception of some specific areas, this potential has mainly been used on a subsistence basis. For industrial production, however, more has to be known about the habitats and life cycles of some fishes.

Industrialization is quickly taking place in some of the ZBC, causing an accelerated process of urbanization for which they are not prepared. Many investments in this sector have only brought advantages to multinationals and minority groups, suffocating national and local industries. Multinational-type industry does not generate considerable employment or establish links with other national segments of the economy. They are, in most cases, oriented toward the international market, because of the lack of economies of scale in the national market. These economies of scale have to be created on the regional level; in addition, diversification should be encouraged among the various countries in order to attain competitive prices for manufacturing products. The creation of such mechanisms is, however, very difficult to implement especially because there is usually a tendency to allocate investments to countries with better infrastructure.

The implementation of new economic policies has to be accompanied by social policies and education programs. It is essential to guarantee a better distribution of the wealth both in rural and urban areas. Investments tend to be concentrated in larger centers where there is better infrastructure. This spurs intensive migration to the favored centers, provoking the formation of pockets of poverty and marginalization in the urban areas. Consequently, the disparities among the various groups of the society are reinforced and the regional inequalities are exacerbated.

For the reasons described above, apart from requiring better integration on the regional level, a program for development of the Zambezi basin has to be implemented on two different levels: the national and the local. The centralization that characterizes the government of the ZBC should facilitate the adoption of general national policies. However, lack of technical and economic resources for designing programs and investigating new possibilities, as well as bureaucratic procedures, hamper dynamism and restrict options. Moreover, political instability usually imposes difficulties. The results are, in many cases, inefficiency or even disasters, especially when policies adopted do not consider local differences and needs. The fragmentation of the social structure of the ZBC implies great variety in local needs, mainly connected to social and cultural values. Even if economic resources are supplied, these values can hamper the implementation of entire programs. Unless local needs are taken into consideration, effective results will be difficult to attain at any level. Actions at the local level will eventually promote national integration, facilitating future development.

Needless to say, environmental impacts of the development of the Zambezi basin have to be taken into consideration. The intensification of the use of the basin will be the cause of great changes not only in the quality of the water but also in the wildlife and climatic conditions. The construction of dams to cope with the future demands for energy, while bringing many advantages, also brings disadvantages which can only be minimized through careful control of the resulting environmental changes. The construction of dams on the Zambezi River and in some of its tributaries such as the Kafue in Zambia, has changed the flooding regime of the basin, affecting the biological conditions of the system, which in turn, affects the economic activities of communities located in the basin. Social programs also have to be implemented for relocating displaced populations, and avoiding dissemination of diseases through the lakes created by the dams. Moreover, the process of deforestation and desertification that is taking place in most of the ZBC because of, among other things, the use of irrigation without drains, or overgrazing, is destroying resources that are essential for the improvement of the quality of life in these countries.

Usually, developing countries are confronted with the difficult choice between economic development and ecological preservation. Simple preservation is usually difficult to achieve in these countries because of the urgent needs of their populations. The new concept of sustainable development created by industrialized nations is still vague and can be difficult for decision-makers to perceive if results of ecological changes are not easily within their reach. Moreover, many projects financed by foreign aid are not contributing to a sustainable development, a surprising paradox. Cheap food has been produced in the developing countries to feed the population of the industrialized nations. Poor planning, however, is resulting in overfarming of fields and destruction of grasslands (Timberlake, 1988). Many of the projects undertaken are financed by aid coming from rich nations, but African populations are the ones that will pay for the final results. A serious aggravating factor is the unstable political conditions found in southern Africa.

8. Policy Exercises for Introducing the Decision Support System of LIR in the Zambezi Basin Countries

Policy exercises are tentative experiences of gathering scientific and policy communities in order to generate new insights into problems, and ideas for future studies and considerations. In order to make such experiences successful, the specific scenario of problems in question have to be kept in mind. For example, when it comes to use such a technique among the Zambezi Basin Countries, economic and technical restrictions, as well as cultural and political differences have to be taken into consideration.

The importance of taking cultural differences into account in conflict resolution, mediation and negotiations of diverse nature is already accepted by many. Nevertheless, the attitude of ignoring or underestimating such differences still dominates, either because these differences are not easily seen sometimes, or because some parties assume, even if not openly, a position of superiority in relation to those who have different values from their own. It should not be forgotten that successful plans and policies cannot be completely transplanted from one country into another; they can only be used as examples for generating new ideas in a different context. To make this possible, it is essential that the culture and values of the society to which the example is taken be well understood and, most of all, respected.

The present interest that each of the riparian countries have in the Zambezi basin can be identified in many cases, as was shown earlier in this paper. However, given the relatively good conditions of the Zambezi basin today, attention to existing problems and their implication in future conditions of the basin will only be raised if advantages of new policies are clearly perceived by policy makers in the short or medium run. Simple preservation is difficult to achieve in developing countries because of their various needs. Therefore, only when results of the new policies start to be felt, can confidence in the approach of sustainable development be improved, and concerns about the future be more disseminated.

For that reason, policy exercises in the ZBC should promote intensive discussion of present issues. New policies have to bring improvement of present conditions first. Naturally, the adoption of any policy of development which can have negative effects on the environment has to be prevented. Concrete examples of environmental degradation identified in the Zambezi basin and in other basins can serve as illustration for consequent environmental behavior in certain conditions. It is necessary that consciousness about the mechanisms of nature and about their influence on social organization be propagated also among decision makers in developing countries. It is essential that an equilibrium between economic development and conservation of nature be constantly pursued by all.

In the Zambezi basin case, one single workshop has a wide range of objectives to cover. This is not only due to economic restrictions but also due to the nature of the problems that have to be considered, which are complex and intermingled. The workshop is an opportunity for tackling a variety of problems at the same time, treating them as a system instead of as single subjects.

Usually, all conditions necessary for decision making cannot be reproduced in a workshop and, therefore, only policies are discussed and come up as the result of the policy exercises, but not decisions. It would certainly be unrealistic to expect any main strategic decision to be made by the ZBC during the workshops, especially considering the level on which the definition of problems in the Zambezi basin is, and the great number of political animosities in the region.

On the other hand, even considering the difficulties that have to be faced, such workshops should aim at more than only generating policies. The workshops should be organized not only to create discussions but also to encourage the preparation of conditions for decisions to be made in a rather near future. This should be expected to remain on a more technical and generic level rather than reach political grounds. But it should be kept in mind that the workshops represent exceptional opportunities for bringing together representatives and specialists from all the ZBC, which for diverse reasons, including economic difficulties and political animosities, do not have so many of these chances. Besides, given the complexity of the problems involved in the exploitation of the Zambezi basin, and in face of the lack of basic information available, time is a crucial variable if these problems are to be resolved before they turn into disasters and catastrophes. Naturally, one cannot expect to solve all problems at once, but can strive to be objective in order to profit from the opportunities available.

Insufficient information may be a strong hindrance for validating options, but the workshop is a great opportunity to discuss any doubts that can arise. These discussions will help determine areas that need more immediate research. Once recognized, practical problems that are important for the development of the whole of the region may help destroy some barriers erected between the ZBC along the years.

At the organizational and institutional level, the ZBC are still not completely structured. This implies long bureaucratic processes in the various levels of policy making and political action. The use of policy exercises is an opportunity for these countries to generate new ideas, policies and plans together even before their institutional organization is well defined. The atmosphere of intensive studies, the participation of experts of different fields, and of decision makers with resolution power can create the necessary conditions for reaching effective results in a workshop.

Summarizing, the objective of the workshop should be:

* to discuss the issues involved in the development of the Zambezi basin, especially the technical ones;
* to introduce the decision support system for managing large international rivers - LIR, by explaining its construction, and teaching specialists and decision makers how to operate it and apply it in the development of the Zambezi basin;
* to give the Zambezi Basin Countries the opportunity to influence and participate in the future development of the LIR;
* to help create a mentality of concern with environmental questions, and a tradition of joint resolution of transboundary environmental problems;
* to generate policies which are viable to the governments and to the people of the ZBC, considering the availability of natural and economic resources, as well as the traditions and social values that are strongly established in the local society;

* to generate sketches of agreements and plans of action for development of the Zambezi basin especially concerning technical matters;
* to discuss research questions for future development.

The workshops should not aim at finding optimal solutions in any of the objectives listed above. They should, instead, aim at generating and choosing options which are feasible, and at defining the steps of implementation of the plans and policies discussed according to each country's actual conditions.

The development of the methodology and techniques for organizing policy exercises is still quite recent and a lot more can be said about this subject. Further considerations can also be made about the peculiarities that should be kept in mind in this specific case. However, this is not the objective of this paper. The reason why the use of policy exercises was discussed here is that this technique is considered appropriate in this case study, as well as in accord with IIASA's working methods.

Finally, it should not be forgotten that workshops represent a great opportunity for scientists from other countries to learn more about Southern African conditions and problems. As a consequence of this direct contact, the quality of research carried out about the region may be considerably improved, which will be a benefit for all.

9. No Model to be Imitated

The development of poor nations is often carried out following the notions and theories extracted from the experiences of the industrialized countries. Because of the numerous interests involved in the development of these countries, particular features of their cultural and social background are not being carefully considered. The peculiarities of many countries are not well understood yet and a lot remains to be studied. Surprisingly, even if the importance of social and cultural aspects has already been widely accepted, many present studies still overemphasize technical solutions.

Industrialized nations can give valuable help to developing countries by assisting them in designing programs to pursue sustainable economic growth, and by giving financial support for the implementation of such programs. A considerable part of the investments necessary to fulfill the vast program of development in poor countries will inevitably come from foreign aid and, since the economic resources are scarce, it is desirable that coordination of programs also takes place among the various donors.

However, all these efforts will be in vain if the aspects discussed in this paper are not kept in mind. Enough knowledge and technology exists today to promote a more sustainable development of natural resources than that carried out during earlier times, but new political and social attitudes are required in this process.

Western society is undergoing a process of change that affects all aspects of life. Social values have been also discussed and some concepts like, for example, development, are being revised. To expect the western values to be adopted by other types of societies is to ignore the various possible ways of achieving development. It should not be forgotten how physical and spiritual needs have been, many times, misunderstood by modern societies which supply people with consumer goods, but also isolate and alienate them. The results are increasing criminality, use of drugs, and military power.

Industrialized countries already understand that the destiny of the developing countries is not independent from their own, and that development in poor nations cannot be marginalized."The fact that the overwhelming majority of humankind understands for the first time in history that human society encompasses the entire globe is a phenomenon equivalent to humankind's understanding that the globe is round rather than flat" (Mazrui, 1976). However, many countries continue to adopt a position of superiority in their attitude toward developing nations, and even many scientific works are still per-

meated with prejudices. Reaction against solutions generated in industrialized nations is the result of a long period of imperialism. Developing nations do need contributions from other nations, but it is essential that they participate actively in the generation of solutions to their own problems.

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