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**UNDERDEVELOPMENT AND NATURAL
RESOURCE ABUNDANCE IN AFRICA**

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Underdevelopment and Natural Resource Abundance in Africa

It is common knowledge that the African continent is very richly endowed with vast natural resources. These resources range from agriculture to fossil fuels and solid minerals. Ironically also, 38 of the 43 countries designated as the poorest, are African countries. There is therefore enormous potential wealth from these natural resources along with abject poverty in many countries. Some researchers have even suggested that natural resources are a curse rather than a blessing on countries because empirically, the countries that have shown the fastest rate of economic transformation and technological progress have not been historically endowed with significant natural resources. Japan, South Korea, and much of Europe did not develop on the basis of exploiting natural resources. In fact, the resource - starved countries seem to have made much more rapid progress than their counterparts with significant natural endowment.

Latin America showcases countries such as Chile and Mexico which had vast natural resources but whose economic transformation has not been better than other countries that are less endowed. Brazil on the other hand has vast natural resources but that has not enabled it to match South Korea with little natural resource.

On the African continent, there are several countries with vast natural resources, but which are still in the league of poorest of the poor countries Nigeria, Angola, Namibia, Sierra Leone, Liberia, Zambia, Democratic Republic of the Congo are examples. There are countries that are strife - torn and war ravaged, where explanation for continued underdevelopment can plausibly be the absence of peace. However, this does not explain everything. One would normally expect that rich natural endowment would bestow certain unique comparative advantage and be the basis for rapid transformation. Most of the countries of the Middle East and North Africa are oil dependent. So much crude oil has been exported that the various economies have been transformed and the standard of living of their populations sufficiently raised to break them away from poverty. Notable

among these are Saudi Arabia, Kuwait, Iraq, Iran, the United Arab Emirate, Jordan, Libya, Morocco and Algeria. One could say of these countries that crude - oil was responsible for their transformation. For them, natural resources were more - or - less sufficient to bring about economic transformation.

One then must ask why countries such as Nigeria, Angola (rich in oil and other minerals) Sierra Leone (with vast deposits of diamond) Zambia, and the Republic of the Congo with their vast copper resources have failed to make a dent on poverty. On the other hand, Botswana is a middle income country mainly on the basis of a small population, vast territory, and enormous livestock resources and the export of diamonds. Does this have any lessons for Africa? What did Botswana do right which Sierra Leone did not do? Why were countries of the Middle East able to break with poverty purely on the abundance of crude oil while Nigeria, Namibia, Angola, and Mozambique are still rated poor after several decades of political independence?

Obviously, more is required than just resource endowment. However, is it possible to get a handle on the critical complements of resource endowment for sustainable development to take place in Africa? What are the specific requirements? This paper explores this issue. In section I, we make a brief survey of the resource endowment of African countries, and the trend of trade in these resources. Section II examines the other natural resources of the continent apart from minerals. In Section III we examine the relative position of the African continent in the context of world development. In the final section we draw some conclusions and raise issues that require focused empirical research in order to shed more definitive light on the place of resource endowment in economic development.

SECTION I AFRICA: A CONTINENT OF MINERAL WEALTH

Africa is truly a continent of plenty with particular reference to its mineral resource endowment. Of 28 important mineral resources, Africa has significant proven reserves in 17 of these. The continent has significant proven reserves of coal, cobalt, copper, chromium, diamond, natural gas, gold, iron ore, lead, manganese, mercury, nickel, petroleum, phosphate rock, platinum, uranium and vanadium. It has dominant reserves of chromium (95%) platinum (89.3%) manganese (79%) phosphate rock (72.5%) vanadium (47%) gold (44%) diamond (46.1%) cobalt (31.5% and uranium (32.5% of the world's proven reserves). See Table 1, for the summary of Africa's mineral reserves in comparison to world reserves in the 17 minerals in which it has significant reserves and in which it is an important producer.

In addition, Africa has 8.4% of the world's petroleum reserves and 4.4% of its natural gas. A few parts of Africa have shown reserves of tin, nitrogen in ammonia, potash, salt, sulfur, molybdenum, tungsten, titanium, silver and zinc. These are, however, not a significant proportion of the world's known reserves.

As impressive as Africa's mineral wealth is quantitatively and qualitatively, little of it is being processed in Africa. The bulk of this mineral wealth is sold as unprocessed primary raw materials of the industries of the rest of the world. Very little value is being added on the continent with the exception of gold, and diamond, which is mined and processed by a few big mining interests in South Africa.

In Table 2 the geographical spread of Africa's major mineral reserves are shown. That Table shows that the Republic of South Africa dominates the African scene in this respect, as twelve of eighteen different minerals listed occur in abundance in South Africa. South Africa is the dominant location of the world's gold deposits (although it is known to occur in Sierra Leone, Liberia, Namibia, Ghana and Ivory Coast), manganese, chromium, platinum and vanadium. Botswana is dominant in diamonds with close to 40% of the world's production of the resource. South Africa, Central African Republic and the Democratic Republic of the Congo are important producers of diamond also. Namibia, Niger and South Africa are dominant producers of uranium.

Morocco and Western Sahara are responsible for over 63.4% of the world's reserve of phosphate rock. With South Africa accounting for about 7.5% it seems clear that the bulk of the world's deposits of phosphate rock are shared by those two African countries.

South Africa is also the singular exception to the norm of merely extracting minerals from Africa and processing these in the rest of the world. This seems to be one of the significant explanations of Africa's underdevelopment. The rest of the African continent does not share in this mineral wealth to any significant extent. Africa could benefit from processed primary products such as refined petroleum, Liquefied Petroleum Gas (**LPG**) non - ferrous metals, leather goods, laminated lumber and particle board; pulp and paper. However, what is occurring at present is that the bulk of Africa's primary exports are in their raw state with little or no value added.

SECTION II: BEYOND MINERALS

Africa's natural endowment goes beyond its mineral resources. It is the second largest continent with an area of 30,217,000 square kilometers. Of this, 2% or 60,4340 km² is inland water. The 1990 population estimate shows that it has 647,518,000 people about 12.5% of the world's population.

Africa has the world's largest contiguous desert, the Sahara Desert, occupying more than 25% of the continents' total land area and lies to the north of the equator which divides the continent in two. It has two other desert areas, the Namib and the Kalahari Deserts, which lie in the southwestern portion of the continent.

The three most important rivers of Africa are the Nile, the Congo and the Niger. Africa has many freshwater lakes, the largest being Lake Victoria the reservoir of the Nile. Lakes Tanganyika and Nyasa are the largest of the string of lakes formed by Africa's two rift valley systems. Other important rivers are the Benue, Zambezi, and the Orange. These six rivers and their tributaries account for most of the drainage area of the continent.

FOREST RESOURCES

It is estimated that only 6% of the African continent is arable while nearly 25% is forested or wooded. These forests especially in the savanna regions of the south and east and north are home to a wide variety of big - game animals. Many African countries have established very rich game parks that attract sizable tourism. Notable among these are Kenya, Tanzania, Uganda, Zambia, and South Africa. Although game parks exist in other parts of the continent, these are much less developed than those of eastern and southern Africa. Table 4 gives a picture of Africa's forest resources. It can be seen that the largest forest resources are in Tanzania, the Central African Republic, Zambia, Angola, Cameroon, Congo, Gabon, Mozambique, Madagascar, Nigeria in that order of size. However, Africa also has the world's fastest rate of deforestation. This rapid rate of deforestation and the small size of arable land exacerbates the subsistence nature of African agriculture. Very few countries in Africa have developed their forestry, although many export their lumber for foreign exchange. The export of lumber and the dominant use of its forests as fuel wood accounts for the high rate of deforestation.

Africa's Agricultural Resources

Agriculture is still the most important sector of the economies of Africa, employing between 85% and 60% of the gainfully employed. Farming is still both traditional and predominantly subsistence. African agriculture is dichotomized into food and cash crops. The food crops include sorghum, millet, wheat, rice, sweet potatoes, potatoes, barley, maize, cassava, yams, bananas, and plantains. The cash crops, are sugarcane, tomatoes, groundnuts, cotton, cocoa, coconut, palm oil, olives, pineapples, oranges, tea, coffee and sisal.

Temperate and subtropical crops are also grown in the northern, southern, and the highlands of eastern Africa, such as wheat, barley, grapes, apples and green beans. The development of horticulture for the export of flowers is growing in a few countries including Kenya, South Africa, Zimbabwe and Zambia. This is high technology Agriculture that requires heavy capital outlay.

Over one quarter of the continent is rangeland and marginal pasture lands with large animal resources including cattle, sheep, goats, pigs, donkeys, camels, and the water buffalo. Dairy cattle is largely exotic to the African continent. Much of the dairy cattle is imported from New Zealand, Australia and Europe. Ethiopia and Botswana account for nearly half of the continent's cattle and ruminant population.

Much of Africa still needs an agrarian revolution as many countries have a large food deficit and have to import food. Table 5 gives a picture of the primary exports to African countries, while Table 6 gives some indication of the fish and animals resources of African countries. Yields of most crops are typically lower than have been attained in other parts of the world. Table 7 gives the typical yields of the main crops grown in Africa.

Much of Africa's agricultural problem could be solved if greater effort is exerted on harnessing its water resources and expanding its irrigation. At present the proportion of farm under irrigation is insignificant in most countries. There is also a wide variation in the fresh water resources per capita on the continent. Countries with vast water resources do not seem to have utilized this to promote sustainable agriculture. Table 8 gives current estimates of these fresh water resources.

SECTION III: AFRICA IN THE CONTEXT OF THE WORLD DEVELOPMENT

In any meaningful discussion of Africa's development, it is important to recognize that there are certain parts of the continent that do not conform to the pattern observable in the bulk of the continent. In particular, South Africa and most of North Africa are marked by difference from what is generally referred to as Sub - Saharan Africa. Of 62 countries classified by the World Bank as low-income countries, 39 or 62.9% are in Sub - Saharan Africa. Five of the 60 countries classified as lower middle income countries are in Sub - Saharan Africa. Six other African countries are classified as upper - middle-income countries, out of 39 such countries world - wide. Only Reunion Island falls in the category of a high - income country. A summary of that classification is given in Table 9.

In contrast none of the countries of North Africa falls into the category of low-income country. Four of the six countries fall in the lower middle income group while the remaining two are in the upper - middle income league.

Apart from income, Sub - Saharan Africa paints a dismal picture when other indicators of well - being are compared. It has the highest prevalence of mortality for children under 5 years, (147 in 1996), the lowest life expectancy at birth (51 and 54 years for males and females respectively in 1996); the highest adult illiteracy rate (34% males and 53% females of people 15 years and above in 1995).

When we focus attention on production, one of the striking characteristics of Sub - Saharan Africa is poor agricultural and manufacturing productivity. With a low proportion of arable land, SSA also is the region of the fastest rate of desertification. It has the lowest percentage of irrigated farming (4% in 1994 - 96) as compared to the average of 19.8% for low and middle-income countries in the same period. (See Table 10). Its manufacturing seems to have gone into decline as some researchers term it "*de - industrialization*". Manufacturing value - added averages 16% for Sub Saharan Africa, the lowest of all the regions of the world.

Clearly, therefore Africa's rich endowment of natural resources does not seem to have raised the welfare of its people. In making this generalization, one must point to the exceptions - South Africa and Botswana. We saw the dominance of South Africa in terms of mineral wealth, and the distinct diamond resource of Botswana.

Gabon is the third country with rich oil wealth and small population. These three countries combine extensive resource endowment with small relative population. But it

is instructive that only South Africa has a developed manufacturing sector comparable to other parts of the world.

Africa's resource endowment is not a sufficient pre - requisite for economic transformation for most other countries apart from the three countries (Botswana, Gabon, and South Africa). Mauritius, which falls in the category of upper middle income country, is a clear example of a country that deliberately chose the increasing return activity of manufacturing, even when it had no significant natural resource endowment. It is a small island with a population of one million in 1997 and a **GNP** per capita of \$3,800 compared with the **SSA** average of \$500 in the same year.

Clearly, most African countries do not have the extensive resource endowment that is comparable to the oil wealth of Saudi Arabia or other countries of the Middle East; South Africa, Botswana and Gabon are exceptions, but even these countries only rank among the middle income countries. For economic transformation to take place in any significant measure, the bulk of African countries must look beyond the mere export of extractive minerals or primary agricultural products. There must be a deliberate investment in processing of these primary products to add value to them if only to stem the perpetual slide in the terms of trade of unprocessed primary products.

What Africa Must Do

The available evidence is that Africa is richly endowed with vast natural resources. These include extensive solid mineral wealth and some fossil fuels. It is also endowed with vast animal resources. Its soil is mostly arid, with only 6% of it being arable.

The mineral wealth is not evenly distributed. Botswana owns most of the diamonds while the Republic of South Africa accounts for the bulk remaining solid minerals. Several African countries are endowed with petroleum and natural gas but this is not on the scale of occurrence either of the Middle East or Venezuela where countries have depended on oil wealth for their economic transformation. The bulk of Africa does not have the benefit of its mineral endowment. Other countries with significant mineral endowment include: Gabon, Algeria, Morocco, Libya, Egypt, Tunisia, Niger, Sierra Leone, Ghana, Cameroon, Nigeria, Namibia, Mozambique, Guinea, Senegal, Central African Republic, Democratic Republic of the Congo, and Republic of Congo, and Angola. These countries could use their mineral wealth to transform their economy by going beyond the mere extraction and export as primary products. They will need to add value to these in order to fully benefit from the endowment.

The resources are also not on a scale that would warrant exclusive reliance on them for economic development, or well - being, the exceptions being Botswana, Gabon, and South Africa.

Africa's agriculture is the most backward in the world. It is largely subsistence, rain - fed, and susceptible to the vagaries of the weather (droughts and floods). It is the least irrigated and is threatened by rapid deforestation. Its manufacturing is in decline and the most important indicators of the quality of life place Africa (especially Sub - Saharan Africa) at the bottom of the ladder of welfare.

Africa's development must focus on:

- a) Resuming its manufacturing and de - emphasizing its primary export activity

- b) Transforming its agriculture through more irrigation and better practices
- c) Upgrading its infrastructure, especially access roads, transportation, communication and energy
- d) Accessing available technology for the various sectors of its development.
- e) Taking steps to access the breathtaking developments in the information technology in order to ensure Africa's participation in the New World Order.
- f) Exploiting the exploding development in Information Technology to become participants in telecommunications and Computer Revolution.

Some elaborate of the first two issues seems necessary in response to concerns raised by two reviewers of an earlier draft.

Resumption of Manufacturing in Africa

The sub title indicates that Africa was once dynamic in its manufacturing. Many African countries had rates of manufacturing growth comparable to those of the newly industrialized countries. Much has been written on why Africa's industrialization was aborted. This paper is not on recounting these failures. We shall only summarize some of the most common reasons given. These are:

- ◆ Policies were merely enunciated but never implemented, monitored, nor evaluated, so that contractual obligations were never enforced;
- ◆ African countries for the purpose of accumulating technological capabilities did not pursue infant industry and import substitution policies; rather they were used to underwrite investors' risks.
- ◆ Import substitution was not geared to generating local competition among producers and were rarely implemented with a timetable for phasing out; this resulted in protective measures being permanent and lack of competitiveness
- ◆ Exports were not the focus of import substitution so that the sequential learning that characterized the NICs was not replicated with African countries
- ◆ African countries displayed a dismal record of very bad public governance coupled with a high level of corruption - economic macroeconomic management was very bad and the wrong product and process niches were chosen

- ◆ Educational systems were neither utilitarian nor responsive to the needs of the productive sectors of the economies

The problem with enumerating the causes of Africa's aborted industrialization is that it gives the impression that once the identified problems are solved, industrialization will follow. It is much easier to enumerate the problems than to solve them. More serious, many of the measures that African countries implemented poorly in the past are no longer available to them as a result of new rules of international trade.

In spite of the problems, however, African countries can resume manufacturing by insisting on raising the value - added of their unprocessed primary products. How this is done will vary from country to country. A focus on food security on the basis of local resources by improving value - added in the entire food chain could cushion the fierce competition that liberalization and globalization imposes.

Agricultural Transformation

African agriculture can be transformed if deliberate efforts are focused on high value products and expanding irrigation. Horticulture products such as flowers have been suggested. This is an activity with high knowledge intensity. It requires operational, managerial, technical and logistical competencies that must be properly planned and executed, quite apart from the financial resources needed to break into that activity. It is, however, not impossible. It is a serious high technology activity - which illiterate subsistence farmers cannot undertake unaided.

It is necessary to de - link African agriculture from the vagaries of irregular rainfall, floods, pests and diseases by increasing irrigation and intensifying the interaction between research and the farmers.

Table 1

IMPORTANT MINERAL RESOURCES OF AFRICA IN THE CONTEXT OF WORLD RESOURCES
(Data are for 1991 unless otherwise stated)

Mineral	Mine production Metric Tons	Proven Reserves Metric Tons	Africa's share % P. R	Rest of the World P. R
Coal	4,731,000,000	1,597,980,000,000	3.7	96.3
Cobalt	34,100	8,344,000	71.4	28.6
Copper	9,100,000	552,000,000	8.0	92.0
Chromium	12,820,000	6,778,000,000	39.7	60.3
Diamond (carats)	48,179,000		46.1	53.9
Gas (natural)	36,400,000,000	97,300,000,000	0.6	99.4
Gold	2,060	49,480	29.1	70.9
Lead	3,370,000	120,000,000	2.1	97.9
Manganese	22,226,000	3,538,000,000	22.4	77.6
Mercury	5,500	240,000	10.9	89.1
Nickel	955,000	111,600,000	6.6	93.4
Petroleum	22,016,000,000	999,113,000,000	5.3	94.7
Phosphate Rock	159,800,000	33,790,000,000	22.7	77.3
Platinum	287	66,091	48.4	51.6
Uranium	28,570		32.5	67.5
Vanadium	33,500	16,600,000	49.2	50.8
			47.0	53.0

Source: Encyclopaedia Britannica 1996

Vol. 8, & 19.

Table 2

MINERAL RESERVES IN MILLION METRIC TONS

Country	Coal	Chromium	Cobalt	Copper	Diamond	Gold	Iron Ore	Lead	Manganese	Mercury	Nickel	Petroleum ¹	Phosphate Rock	Platinum Group Metals	Uranium ² (tons)	Vanadium	Natural Gas	Tin
Algeria					1.50					0.003								
Angola											0.90							
Botswana					13.0													
Democratic Republic of Congo			2.090	30.0	2.70													
Central Africa																		
Republic					0.30													
Gabon												22,800.0			710.0			
Ghana						0.01												
Libya																		
Mauritania									163.0									
Namibia							300.0											
Niger															3,210.0			
Nigeria															2,830.0	2,450,000.0		
South Africa	55,333.0	5,536.0			3.80	0.022	5,900.0	5.0	2,631.0		2.6	17,100.0	270.0	2,530.0	0.059	2,529.0	7.80	
Zambia			0.540	30.0														
Zimbabwe			927.0			0.012												
Morocco																		
& Western Sahara																		
Senegal																		21,440.0
Togo																		180.0
Tunisia																		80.0

¹ see Table 3 for details on Africa's petroleum exports² figures of production only.

Table 3

PETROLEUM EXPORTS (Thousands of metric tons)

	1987	1988	1989	1990
Angola	12750	15750	15813	16525
Cameroon	7939	8104		
Congo	6895	7038	6809	7194
Cote d' Ivoire	243	200		
Gabon	7057	7895	9925	12499
Nigeria	55452	58431	70116	73701
Zaire	1385	1530	1374	1468
Algeria	22789	23464	24520	25991
Egypt	41960	42620	45340	54409
Tunisia	4265	4284	4293	4121

Source: African Development Indicators 1994 - 95

Table 4

FOREST RESOURCES

COUNTRY	FOREST AREAS		ANNUAL DEFORESTATION 1990 - 95		REFORESTATION 1980'S	
	TOTAL AREA THOUSANDS 'sq. Km	1990	Sq. Km	% change	Average annual (thousand of hectares per year)	% change
Algeria	41		234	1.2		
Angola	231		2370	1.0	4	
Benin	49		596	1.2	0	
Burkina Faso	44		320	0.7	3	
Burundi	2		14	0.4	3	
Cameroon	204		1292	0.6	2	
Central African Rep.	306		1282	0.4		
Chad	114		942	0.8	0	
Congo Democratic Rep						
Congo Republic	199		416	0.2	0	
Cote d'Ivoire	109		308	0.6	8	
Egypt	0		0	0		
Ethiopia	142		624	0.5	13	
Gabon	182		910	0.5	1	
Ghana	96		1172	1.3	3	
Guinea	67		748	1.1	0	
Guinea - Bissau	20		104	0.4	0	
Kenya	12		34	0.3	13	
Lesotho	0		0	0	0	
Madagascar	158		1300	0.8	15	
Malawi	35		548	1.6	1	
Mali	121		1138	1.0	1	
Mauritania	6		0	0	0	
Mauritius	1		0	0	0	
Morocco	90		118	0.3		
Mozambique	173		1162	0.7		
Namibia	126		420	0.3	5	
Niger	24		0	0	3	
Nigeria	156		1214	0.9	32	
Rwanda	2		4	0.2	4	
Senegal	75		496	0.7	4	
Sierra Leone	19		426	3.0	0	
South Africa	45		150	0.2		
Tanzania	336		3226	1.0	11	
Togo	14		180	1.4	1	
Tunisia	7		30	0.5		
Uganda	63		592	0.9	2	
Zambia	323		2644	0.8	3	
Zimbabwe	89		500	0.6	6	

Sources: Cleaver 1993. A Strategy to Develop Agriculture in Sub Saharan African and a focus for World Bank.

World development report 1998/99

African Development Indicators 1994 - 95

Table 5

INCOME FROM THE PRIMARY PRODUCT TRADE

COUNTRY	PRIMARY COMMODITY EXPORTS MILLIONS OF US DOLLARS		FOOD EXPORTS		MINERALS ORES METAL EXPORTS		AGRICULTURAL RAW MATERIAL EXPORTS		FUEL EXPORTS	
	1990	1991	1992	1992	1992	1992	1992	1992	1992	1992
Algeria	97	110	113	55	57	1	11,679			
Angola	253	176	198	12	186	0	3,635			
Benin	58	66	74	63	0	14	3			
Botswana										
Burkina Faso	133	126	124	53	0	72	0			
Burundi	73	88	70	65	1	5				
Cameroon	1318	1261	1081	618	171	292	295			
Central African Rep.	86	75	52	29	1	22	0			
Chad	175	175	175	40	1	135	9			
Congo Republic	81	60	70	19	1	49	1,175			
Cote d'Ivoire	2600	2325	4901	3971	12	918	651			
Egypt	260	159	130	130	0	28	5			
Gabon	302	278	282	12	120	150	1,924			
Ghana	835	930	925	755	131	39	6			
Guinea										
Guinea - Bissau	19	20	6	6	1	1	0			
Kenya	588	731	771	658	39	75	175			
Lesotho										
Madagascar	246	232	236	198	21	16	1			
Malawi	401	453	369	360	0	9	0			
Mali	359	376	356	110	0	246				
Mauritania	448	420	460	41	418	0	0			
Mauritius	398	386	421	413	1	8	26			
Morocco	1,868	1857	1660	1077	479	104	125			
Mozambique										
Namibia										
Niger	287	268	267	27	234	6	0			
Nigeria	450	404	391	367	5	19	11,363			
Rwanda										
Senegal	510	410	438	357	63	18	83			
Sierra Leone	97	102	105	54	50	1	6			
South Africa	11863	12161	11997	5527	4566	1904	629			
Tanzania	340	295	325	244	3	78	12			
Togo	239	231	185	48	93	45	0			
Tunisia	475	620	486	409	52	25	610			
Uganda	192	187	163	144	5	15	1			
Zambia	1236	1059	1977	10	1066	0	15			
Zimbabwe	988	861	831	544	197	90	9			

Source: African Development Indicators, 1994 - 95

Table 6

FISHERIES AND ANIMAL RESOURCES 1996 (10,000\$)

COUNTRY	FISH & FISH PRODUCTS		LIVE ANIMALS		MEAT & MEAT PRODUCTS		DAILY PRODUCTS AND EGGS		HIDES AND SKINS	
	IMPORTS	EXPORTS	IMPORTS	EXPORTS	IMPOS	EXPOS	IMPORTS	EXPORTS	IMPS	EXPOS
Algeria	3303F	455F	2541		5263		46979	180F	594F	121
Burkina Faso	2956F		30F	27530F	129F		6495	17F	17F	3250F
Cameroon	14603	1422	50	220	2153	7	8727	298	8	613
Central African Rep.	353F		2834	428	165		772		9	15
Chad			18F	32700F	877F	450F	3536			120F
Congo Rep.	21726F	5761F	1260F		30222	50F	14349	60F		2F
Cote d'Ivoire	157267F134361F	57634	35F	9245	82197	41F	289	1F	513F	
Egypt	7904F	336F	7942	739	17566	228	18118	420	203	7
Ethiopia				896	219F	H81F	2875			65604
Gabon	8382F	1780F	1184		39819	39	15502			
Gambia	202F	3061F			391		6151			75
Ghana	74161	62583	399	237	14972	31	8864	176	48	6
Kenya	6872	50435	281	573	276	1884	809	3764	36	954
Liberia	1672F	908F	1120F		2855		3530			
Libya	1368F	3126F	8495		1300		11769			1906
Madagascar	49074	54319F	136	12F	75	4187	5911	3F		1813F
Malawi	917F	215F	420	23F	425		5780			440
Mali	660F	410F	350F	100030F61F			19180		310	
Mauritius	33286F	1705F	7767	7428	32353	9629	52698	76	17	10
Morocco	6622	743121	62140	216	18618	723	84072	12067	4905	936
Nigeria	15938F	2642F	16603F	1F	526		21652	15F	38F	243
Reunion	44440	16434	2550	21	100491	305	59438	352		
Senegal	890F	10282F	36041	28F	1579	50F	37495	24F	34	3554
Seychelles	8944F	22711F	152	77	3564	25	7391	3	1	
Sierra Leone	3420F	14000F	1471		1210		4305			
Somalia	80F	5680F		62590			4200F			1340
South Africa	134517F25600F	12357	570	13320		5038	5587	1043	11339	2251
Sudan	2560F	190F	335	84713		15700F	7250			1800
Tanzania	230F	19118F	2700F				4460			
Togo	13550F	600F	267F		2939	1F	6394	390F		744
Tunisia	7833	88938	4411	3333	8429	265	308336	4138	6744	7851
Uganda		12263F	350F		100F		2300F			80
Congo Dem. Rep.	33829F		295F		41370		13018			234F
Zambia	1561F	66F	2544	215F	266F	150F	1732	100F	197F	
Zimbabwe	14498F	655F	588	7081	248	19445	3922	13926	666	6672

Source: FAO year book 1996, Vol. 50 pp. 331 - 348

Table 7

MAJOR CROPS

COUNTRY	AREA UNDER MAJOR CROPS THOUSANDS OF HECTRES		AGRICULTURAL YIELDS BY MAJOR CROPS (THOUSANDS OF HECTOGRAMS PER HECTRE)														
	1990	1991	MAIZE	COFFEE	COTTON	WHEAT	MILLET	SORGHUM	TEA	'90	'91	'90	'91	'90	'91	'90	'91
Algeria	7644	7653	2.7	4.0	0.2	0.3	11.9	11.7	4.8	10.8	5.2	4.8	7.3	7.8			
Angola	3400	3450	9.0	9.3					8.0	8.0							
Benin	1860	1870	11.9	16.9	8.4	9.0	11.4	9.3			3.9	7.0	6.0	9.1			
Burkina Faso	3563	3563	13.5	13.9	8.4	9.0	10.9	11.2			10.5	10.5	11	11.2	6.7	8.3	
Burundi	1338	1350	18.5	18	3.4	4	12.1	13.1					8.5	7.7			
Cameroon	7008	7020	8.2	8.2	5.9	5.1	7.9	4.9					5.0	4.6			
Central Africa Republic	2006	2006															
Chad	3205	3205					7.7	6.2			3.4	4.9	6.4	7.4			
Congo Dem. Rep.			8.9	8.9	3.1	3.2											
Congo Republic	168	169	7.2	7.5	2.2	1.6	19.5	22.1	49.4	52.0			10.5	10.1			
Cote d'Ivoire	3690	3690															
Egypt	2648	2643															
Ethiopia	13930	13930	16.4	15.3	7.0	7.2											
Gabon	457	457	15.7	16.4	3.9	4.2					6.0	5.4					
Ghana	2720	2730	11.9	15.3	5.0	5.0											
Guinea	728	730	9.5	10.4	5.0	5.0											
Guinea - Bissau	335	340	10.7	11.4	6.8	5.6			18.6	18.6	8.7	12.2	8.8	10.3	20.3	20.4	
Kenya	2430	2440	12.9	11.8	3.5	3.5			14.1	8.1			9.5	6			
Lesotho	340	340															
Madagascar	3102	3102	10.0	11.5			7.6	6.9					5.0	6.0			
Malawi	1670	1690	11.6	13.8	11.6	13.4					6.1	7.1	6.6	10.4			
Mali	2093	2103	6.1	6.0							2.8	2.7	5.1	4.8			
Mauritania	205	205															
Mauritius	106	106															
Morocco	9327	9420							13.3	18.7							
Mozambique	3130	3130	4.5	3.2	4.7	4.7									8.0	8.3	
Namibia	662	662	12.4	12.5					15.6	20.0							
Niger	3605	3605									2.4	4.2	1.3	2.1			
Nigeria	32300	32300	12.2	12.3													
Rwanda	1155	1160	13.5	13.0	5.8	6.8	6.8	7			11.8	11.7	10.5	10.9	10.5	11.1	
Senegal	2350	2350	14.4	11.3			10.0	11.8			5.8	6.7	9.1	7.8			
Sierra Leone	636	636			23.0	22.6											
South Africa	13174	13174	25.1	27.0					11.2	15			11.9	12.1			
Tanzania	3367	3370	15	12.0	4.3	3.9	4.6	5.1			11.2	7.8	9.7	9.2	14.4	10.4	
Togo	669	669	9.7	9.1	6.2	6.8	12.4	11.9			4.1	3.7	6.2	7.4			
Tunisia	4851	4875															
Uganda	6710	6750	15	13.5	4.8	5.5	2.8	2.0			15	15	15	15			
Zambia	5268	5268	14.3	17.1	4.8	6.6	4.8	6.6	43.9	43.8							
Zimbabwe	2812	2814	17.2	14.4	12.5	12.8	12.5	12.8	58.2	56.4							

Table 8

FRESH WATER RESOURCES

COUNTRY	FRESH WATER RESOURCES CU. METRES PER CAPITA (1996)	FRESH WATER RESOURCES CU. METRES PER CAPITA	ANNUAL WITHDRAWAL			FRESH WATER RESOURCES		ANNUAL RIVER FLOWS FROM - TO OTHER COUNTRIES CUBIC KM
			% FOR TOTAL RESOURCES	AGRI.	INDUSTRY	DOMESTIC	CUBIC KM	
Algeria	483	32.4	76	18	6	1		
Angola	16,577	0.3	60	15	25			
Benin	1,829	1.5	67	10	23			
Burkina Faso	164		81	0	19			
Burundi	561	2.2	64	0	36			
Cameroon	19,596	2.8	35	19	46			
Central Africa Republic	42,166	0.1	17	5	21			
Chad	2,269	0.0	82	2	16			
Congo Dem. Republic	20,670	1.2	23	16	61			
Congo Rep.	345,619	0.0	11	27	62	621		
Cote d'Ivoire	5,346	0.0	67	11	22			
Egypt	47	1,967.9	85	9	6	56		
Ethiopia	1,889	2.0	86	3	11			
Gabon	145,778	0.0	6	22	72			
Ghana	1,729	1.0	52	13	35			
Guinea	33,436	0.3	87	3	10			
Guinea - Bissau	14,628	0.1	36	4	60			
Kenya	738	10.1	76	4	20			
Lesotho	2,571	1.0	56	22	22			
Madagascar	24,590	4.8	99	0	1			
Malawi	1,747	5.1	86	3	10			
Mali	6,001	2.3	97	1	2			
Mauritania	171	407.5	92	2	6			
Mauritius	1,940	16.4	77	7	16	7		
Morocco	1,110	36.2	92	3	5			
Mozambique	5,547	0.6	89	2	9			
Namibia	3,913	4.0	68	3	29			
Niger	375	14.3	82	2	16	30		
Nigeria	1,929	1.6	54	15	31	47		
Rwanda	937	12.2	94	2	5			
Senegal	3,093	5.2	92	3	5	12		
Sierra Leone	34,557	0.2	89	4	7			
South Africa	1,190	29.7	72	11	17			
Tanzania	2,623	1.5	89	2	9			
Togo	2,719	0.8	25	13	64			
Tunisia	385	87.2	3		9	1		
Uganda	1,976	0.5	8		32			
Zambia	8,703	2.1	7		16			
Zimbabwe	1,254	8.7						

Source: World Development Report 1998/99.

Table 9

SUMMARY CLASSIFICATION OF ECONOMIES BY INCOME AND REGION 1998

INCOME GROUP	SUB GROUP	ASIA				EUROPE AND CENTRAL ASIA		MIDDLE EAST & NORTH AFRICA	
		EAST & SOUTHERN AFRICA	WEST AFRICA	EAST ASIA & PACIFIC	SOUTH EASTERN EUROPE & CENTRAL ASIA	REST OF EUROPE	MIDDLE EAST	NORTH AFRICA	AMERICA
Low Income		18	21	5	6	8	1	3	
Middle Income Lower		3	2	14	2	12	5	4	18
Middle Income Upper		5	1	3		6	4	2	13
High Income	OECD countries			4			18		2
High Income	NON-OECD countries	1		9		1	7	4	8
Total		27	23	35	8	27	27	14	44

Source: Compiled from World Bank's World Development Report 1998/99 pp. 250 - 251.

Table 10

CROPLAND AND IRRIGATION IN AFRICAN AGRICULTURE

Country	Cropland % of Land Area Increase + or Decrease -		Irrigation land % of Cropland Increase or Decrease -	Arable Land Hectare per Capita		Arable Land per Capita % Decline
	1980	1995 - or +		1979 - 81	1994 - 96	
Algeria	3	3	0	3.4	0.37	0.27
Angola	3	3	0	2.2	0.41	0.28
Benin	16	17		0.3	0.39	0.26
Burkina Faso	10	13		0.4	0.40	0.33
Burundi	46	43		0.7	0.24	0.15
Cameroon	15	15	0	0.2	0.68	0.46
Central African Rep.	3	3	0	0.2	0.81	0.60
Chad	3	3	0	0.2	0.70	0.51
Congo Democratic Rep	3	3	0	0.1	0.26	0.17
Congo Republic	0	0		0.7	0.08	0.06
Cote d'Ivoire	10	13		1.4	0.24	0.21
Egypt, Arab Republic	2	3		100.0	0.06	0.05
Ethiopia	12		1.7			0.20
Gabon	2	2	0	0.9	0.42	0.29
Ghana	16	20		0.2	0.18	0.17
Guinea	3	4		12.8	0.13	0.10
Guinea - Bissau	10	12		6.0	0.32	0.28
Kenya	8	8		0.9	0.23	0.15
Lesotho					0.22	0.16
Madagascar	5	5	0	21.5	0.29	0.20
Malawi	14	18		1.3	0.21	0.17
Mali	2	3		2.9	0.31	0.33
Mauritania	0	0		25.1	0.12	0.09
Mauritius	53	52		15.0	0.10	0.09
Morocco	18	21		15.0	0.39	0.3
Mozambique	4	4		2.1	0.24	0.17
Namibia	1	1		0.6	0.64	0.51
Niger					0.63	0.53
Nigeria	33	36		0.7	0.39	0.28
Rwanda	41	47		0.4	0.15	0.13
Senegal	12	12		2.6	0.42	0.28
Sierra Leone	7	8		4.1	0.14	0.11
South Africa	11	13		8.4	0.46	0.40
Tanzania	3	4		4.1	0.12	0.11
Togo	43	45		0.3	0.76	0.51
Tunisia	30	31		4.9	0.51	0.32
Uganda	28	34		0.1	0.32	0.27

Table 11

THE RECOVERABLE OF THE WORLD*

REGION	CUMULATIVE PRODUCTION TO 1985	PROVEN RESERVES	UNDISCOVERED RESOURCES	TOTAL OIL ENDOWMENT
North America	166	59	132	357
South America	53	35	33	121
Western Europe	12	26	17	55
Eastern Europe	96	63	109	268
Middle East	146	398	125	669
Africa	41	57	46	144
Asia / Oceania	30	19	58	107
Total World	544	657	520	1,721

* In billion barrels: percent of original reserves by average API gravity: 10 - 20.5 percent; 20 - 25.6 percent; 25 - 35.57 percent; above 35.32 percent.

Table 12

THE RECOVERABLE NATURAL GAS RESOURCES OF THE WORLD

REGION	CUMULATIVE PRODUCTION TO 1985	PROVEN RESERVES	UNDISCOVERED RESOURCES	TOTAL GAS ENDOWMENT
United States	18.8	5.6	16.6	41.0
Canada	2.2	2.8	9.6	14.6
Mexico and Latin America	2.4	4.6	7.4	14.3
Western Europe	3.3	6.4	4.7	14.4
Soviet Union	6.0	42.5	37.1	85.6
Middle East	2.0	24.2	24.1	50.3
Africa	0.7	5.6	5.1	11.4
Asia / Oceania	0.8	4.8	10.7	16.3
China	0.2	0.8	6.5	7.5
Total World	36.4	97.3	121.8	255.4

Table 13

THE RECOVERABLE HEAVY OIL RESOURCES OF THE WORLD*

REGION	CUMULATIVE PRODUCTION TO 1985	PROVEN RESERVES	UNDISCOVERED RESOURCES	TOTAL HEAVY OIL
United States	10.1	18.1	23.6	51.8
Canada	0.4	0.7	4.9	6.0
Mexico	1.2	4.2	1.6	7.0
Venezuela	12.6	277.9	13.0	303.5
Remaining Latin America	0.2	1.6	3.2	5.0
Western Europe	0.8	8.0	0.2	9.0
Eastern Europe	0.1	0.3	0	0.4
Soviet union	5.2	6.9	20.6	32.7
Middle East	31.5	115.4	22.1	169.0
Africa	0.4	3.6	0.6	4.6
Asia / Oceania	2.3	3.7	3.6	9.6
China	0.3	9.2	0	9.5
Total World	65.1	449.6	93.4	608.1

* In billion barrels.

Table 14

RECOVERABLE TAR SAND (BITUMEN) SOURCES OF THE WORLD

Region	Recoverable Resources
United States	4.3
Canada	265.5
South America	0.9
Western Europe	0
Eastern Europe	0.1
Soviet Union	78.2
Africa	4.0
Asia	0
China	1.0
Total World	354.0