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C. O. Okidi

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C. O. OKIDI\*

# The State and the Management of International Drainage Basins in Africa\*\*

## INTRODUCTION

Rivers or lakes are considered to be international if their surface settings traverse the territories of two or more states. In the case of a river it may form whole or part of the boundary of two or more states; alternatively, it may flow successively, through two or more states; some situations present a combination of both. In the case of a lake, it may actually be shared by two or more states. Thus, rivers or lakes as such are distinguishable from the concept of drainage basin, where the latter is broader, constituting the entire catchment area which contributes both, the surface and groundwater towards a common terminus.

There are about 54 international rivers and lakes in Africa. Out of that total, 11 drain the territories of four or more states, with the largest number of states drained by any one river being ten. Nineteen basins drain areas more than 100,000 square kilometers, and in all, the area drained by these international rivers and lakes is about half of the total areas of the continent.<sup>1</sup> That, certainly, is considerable reticulation of water systems in this vast continent.

There have been attempts to organize the basin states towards the management of the water systems. The current institutions for such purposes include: Niger Basin Authority (NBA); Organization for the Management of Senegal Basin (OMVS); Organization for the Management of Gambia Basin (OMVG); Kagera Basin Organization (KBO); Chad Basin Commission (CBO); and the Permanent Joint Technical Committee (PJTC), between Egypt and Sudan on the Nile Waters. Currently, the United Nations Environment Programme (UNEP), under its programme for environmentally sound management of inland waters (EMINWA) is initiating an integrated regional development programme for the Zambezi River, later to be followed by Lake Tanganyika.

The purpose of this paper is not to review the management regimes of

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\*Research Associate Professor, Institute for Development Studies, University of Nairobi, Nairobi, Kenya.

\*\*Views expressed in this paper are those of the author. They do not have official standing as such.

1. Data have been gleaned from the records at the United Nations Economic Commission for Africa (UNECA). For a summary see UNECA, Problems of Water Resources in Africa. Doc. No. E/CN. 13/NRD/WR/Rev. 2, 49 (Oct. 21, 1976) (Addis Ababa).

these organizations. Rather, this paper will examine some of the macro-policy questions of state involvement in actual management and utilization of the waters of any basin in Africa. The paper will take up selected issues and concepts and point to experiences with the utilization of river waters for the promotion of socioeconomic goals at national or regional levels. In other words, the paper takes the position that whether the management and utilization of the water is done within a national or regional framework, the role of the state will evince certain common conditions and the net results are similar when looked at from the perspective of promotion of socioeconomic well-being of the human population.

To set the stage for the discussion, the paper will begin with a brief outline of the significance or justification of the management of water resources on a basin-wide basis. Secondly, it will outline some of the justifications for state involvement in the management of such basin waters. In the process, we should see some of the salient activities which the state is to be expected to perform. Thirdly, despite the imperatives of state involvement, there are a number of drawbacks in the state performing the roles; the next part of the paper is intended to outline some of such caveats, posed as criticisms. It is expected that the discussion should automatically suggest the limitations or caveats to state involvement in the management. Such caveats should by themselves suggest themes for social scientific research on improving efficiency of managing drainage basins.

### **THE SIGNIFICANCE OF BASIN-WIDE MANAGEMENT**

The area of Africa which is covered by the reticulation of rivers and lake basins, as mentioned above, is about one half of the total area of the continent. But in discussing the rivers and lakes, implicitly, the factor of interest is actually water which they carry and consequently what could actually be done with the available volumes of water in the pursuit of development goals. That point, in turn, leads us to some of the most critical socioeconomic policy questions which Africa has faced in recent times, particularly since the early 1970s, which might have been alleviated by proper management of water resources.

Ordinarily, community water supply for the safeguard of public health is considered the most pervasive socioeconomic use of water. Some might mention also the use of water in industries and even water transport; all these can benefit from availability of bodies of water in Africa.

But in actual fact two of the most critical uses of water that have relevance for the problems of the 1970s and '80s is in agriculture for food production and hydroelectric power generation. These are the two most dreaded problems of African economic development and growth in

the last decade and a half. Drought (defined as absence of rain water) is considered in general officialdom as having led to devastating famines and loss of human and animal lives in Africa in the 1980s. No single problem has ever mobilized equal amounts of international attention towards Africa, since colonization, as the emergency operation to deal with famine. The underlying supposition is that Africa has not had enough water for agricultural food production.<sup>2</sup>

The second critical problem for the majority of African countries during that period is low production of indigenous energy where most of them have relied heavily on hydrocarbons. It is maintained that the second villain in the poor performance of African economies has been the prices of the hydrocarbons which were increased by members of the Organization of Petroleum Exporting Countries (OPEC), since the so-called oil embargo which commenced in 1973. The basic argument in that context is that the countries relied principally on the expensively imported hydrocarbons to fuel their industries, transportation, and domestic/urban operations.

Surely, the two problems could impede operation of the economies of African countries, if there were, indeed, no alternatives to evenly distributed rainfall, and sources of energy other than hydrocarbons. But is that firmly the case? The volume of surface water available is readily suggested by the reticulation of rivers and lakes as discussed above. The estimates of the actual volume cannot be precise. However, K.V. Krishnamurthy, who worked for U.N. Economic Commission for Africa in the water resources matters, has offered the following suggestive data:

Estimates of Africa's total water resources vary from 3,400 billion m<sup>3</sup> of water to 4,600 billion m<sup>3</sup>. An analysis of the measured streamflow in African rivers indicates that the total quantity of surface water in Africa's rivers and lakes is in order of 2,480 billion m<sup>3</sup>, the difference between this and the aforementioned estimates being a measure of groundwater resources. More than 50 percent of the total water resources of the continent are in one single river basin, Congo/Zaire basin (1,325 billion) and another 25 percent in seven other river basins such as Niger (200 billion), the Ogooue (149 billion in Gabon), the Zambezi (104 at C. Ana), the Nile (84 billion), the Sanage (Cameroon, 165 billion), the Chari-Logone (Chad, 43 billion) and the Volta (40 billion).<sup>3</sup>

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2. This is eloquently expressed by Professor Adebayo Adedeji, the Executive Secretary of UN Economic Commission for Africa and Special Representative of the United Nations Secretary-General on the African Economic Crisis in his "End-of-the-Year Conference on Africa's Current Economic Crisis and the Prospects for 1985" issued at his Addis Ababa Office on Dec. 28, 1984 where he singled out "Drought and Emergency Situation" as the dominant problems, in a list which also included unfavorable global economic environment and the dramatic increase in Africa's external debt.

3. See K.V. Krishnamurthy, *The Challenge of Africa's Water Development*, I Nat. Res. F. 369, 371 (1977).

The study adds in the same page that the actual total water utilization in Africa was about 90 billion m<sup>3</sup>, which represents about only two percent of the surface and groundwater resources in the continent. That is to say, about 95 to 98 percent of the African water resources is at present flowing only to replenish the ocean waters, but not put to any productive use by Africa. Non-hydrologists might not clearly imagine the magnitude involved, but Krishnamurthy, as a hydrologist, concludes that this is a colossal under-utilization of Africa's water resources and calls for immediate redress.<sup>4</sup> One must conclude, indeed, that the problem for Africa is not scarcity of water resources. Abundant water may only be said to be unevenly distributed by seasons and locations. To use it in agriculture dependably would seem to require flow control and redistribution.

How about hydroelectric power as a source of energy in Africa? Again Krishnamurthy<sup>5</sup> reports that in relative terms, one third of the world's potential hydropower is in Africa and that the per capita potential in Africa is more than three times the world average. He adds that despite that high potential, the installed capacity of hydroelectric power in Africa is only 5.6 percent of the total, and that the ratio of energy generation to the exploitable potential is only 2 percent. The relative figures are indicated in Table 1.

Even though the data in Table 1 are only subject to detailed appreciation by an engineer, the point is made that while Africa has a large share of the world total hydroelectric power it is using very little of it, having installed only 5.6 percent. And this power, which is indigenous to the continent, might in fact be less costly than the energy from hydrocarbons. The task for Africa may be to consider hydroelectric power generation as an integral part, if not in fact, the incentive for multipurpose water resources development in Africa. And it is conceivable that the hydro-power might enhance the use of the water resources in agriculture in order to get Africa towards socioeconomic normalcy.

Returning to the subject of water and agricultural productivity: It should be clarified that apart from water, land is indispensable for agricultural productivity. The question might be asked whether Africa perhaps has sufficient cultivable land, even if it has the water. Not so: Professor Ode-

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4. Note, however, that more than three quarters of the total rainfall in Africa is immediately lost through evaporation, a fact which might be significant in designing water conservation projects. See Doc. No. E/ Doc. No. E/CN. 14/NRD/WR.2/Rev. 2 (1976), see Table 1 at page 649. Note further that the knowledge of Africa's groundwater reserves is not complete, as directed by some recent discoveries. Perhaps the most dramatic discovery is that of the lake under the Sahara Desert, which Libya is planning to exploit at the rate of 6 million m<sup>3</sup> per-day. See a feature story in *The Sunday Times* (Nairobi), Dec. 22, 1985 at 4, col. 3. At the same time, Egypt under the late President Sadat had already embarked on plans to expand desert agriculture by 500,000 acres, using waters of the underground lake. See, *Egypt's Desert of Promise*, 161 *National Geographic* 190 (Feb. 1982). If there are any connections between the two aquifers then the two states might one day want to talk about jointly planned utilization of the water from the reservoir.

5. Krishnamurthy at 370 (cited in note 3).

TABLE 1

Item	Africa	World	Africa's share of the world total (%)
1. Potential hydro capacity (MW)	200,000	565,000	35.4
Installed capacity (MW) 1974	9,050	340,000	2.7
(MW) 1975	11,250	—	—
2. Percentage of installed to potential hydro capacity (1975)	5.6	—	—
3. Hydro-potential (billion of kWh) (theoretical)	2,690	6,540	41.0
(exploitable)	1,630	5,000	33.0
4. Hydropower generation in 1974 (billion of kWh)	34	1,433	2.4
5. Percentage of generation to the exploitable potential	2	30	7.0

Source: *UNECA Problems of Water Resources Development in Africa E/CN.14/NRD/WR/2/Rev. 2* at 28 (1976).

Ogwell,<sup>6</sup> then Secretary to the United Nations World Food Council, wrote in 1982 that Africa's agricultural land potential is immense and that land was certainly not a constraint. That Africa's potential compares favorably with other regions, he says, is suggested by Table 2.<sup>7</sup>

If both water and land are actually available within the continent then the constraint to agricultural productivity (leading, in large measure, to the crisis) must lie elsewhere. In the paper under reference, Professor

TABLE 2

Region	Potentially cultivable (m ha)	Presently cultivated arable area (m ha)	Presently cultivated (%)	Average period (yrs)
Africa	803.7	193.7	24	3
Southwest Asia	46.0	50.9	110	2
Southeast Asia	324.8	270.5	83	3
South America	814.9	85.2	10	4

6. L.A. Odero-Ogwell, *The African Food Problem and the Challenge to the International Community* (mimeo, 1982).

7. *Id.*, Table 3 at 7. Explanatory notes offered stated that the average fallow periods are a very general estimate for fallow period required for one year cultivation (low inputs). The figures for South America were only provisional. The percentage for the presently cultivated period is higher than 100 implying that land which is not suitable for cultivation has already been encroached on.

Odero-Ogwell points to the failure to adopt technological packages in agriculture as one of the bottlenecks. One instance which he raises is that in Africa in 1977, only 1.8 percent of the cultivated land was irrigated, compared to 28 percent in Asia and 6.1 percent in Latin America.<sup>8</sup>

This, in fact, may point to one of Africa's critical problems in agricultural productivity: There is plenty of water and land but it is all unevenly distributed and the water is *not* managed, controlled and transferred to the appropriate land for agricultural productivity. Although other factors such as trained manpower, implements, and fertilizers may also be lacking in the African agriculture (discussed later in this paper) failure to manage and control water, already demonstrated to be available in large quantities, is clearly a central constraint. Therefore, the necessity for the management and control of water resources in the lakes and rivers in Africa seems well demonstrated.

Both use of water for irrigation and hydroelectric power generation require control of the river water through damming; they require change in the flow regime. But while harnessing the river water for hydropower changes only the flow regime of the river, abstraction of the river or lake water for purposes of irrigation reduces the quantities. Indeed, irrigation is the most voracious of all quantitative uses of water resources.

Change of the flow regime alone may mean that the water does not reach the lower riparians in the quantities and at the same time as under the natural flow regime, but that the same volume of water finally gets there. Thus, this may offer only a limited basis for complaint by a lower riparian, against an upper one, provided that it can be demonstrated that the natural flow regime is restored by the point where the river enters the territory of the lower one.<sup>9</sup> Thus, a complaint or a claim may be legitimate if the flow is disrupted to the detriment of existing use of water in the lower riparian.

On the other hand, irrigation will of necessity diminish the quantity of water reaching the lower riparian. For ongoing projects in the lower riparian states, the consequences of a sudden interruption in the quantity of water could be disastrous. But it may also be fatal for any planned projects.

In any case, damming of a river usually has consequences even for the upper riparian states. The most notorious problem is the backwater effect resulting in the displacement and resettlement of population residents within certain reaches of the river. Examples of this problem are

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8. Odero-Ogwell at 6 (cited in note 6).

9. In "Lake Lanoux" Arbitration, the Tribunal rejected the claim by Spain that the French's mere diversion of the Carol River water and restoring it without consumption, constituted breach of the Spanish interests. See "Lake Lanoux" Arbitration in 12 UNRIAA 218, also reprinted in 53 Am. J. Int'l L. 156 (1959).

legion, but one of the better known instances was the construction of the High Aswan Dam which, with a height of 100 meters, was to extend to nearly 700 kilometers southwards, with 250 kilometers out of that being in Sudanese territory and affecting the settlement at Wadi Halfa. Fortunately, there was a longstanding framework of consultation available between the two countries, within which they could resolve the issue.

More recently the backwater effect of the proposed Rusumo Dam on the Kagera River led to tough negotiations among the members of Kagera Basin Organization (KBO) because of its anticipated impact on the settled areas in the densely populated Rwanda and Burundi. The elevation of the dam would be in direct proportion to possible hydropower production at other sites such as Kakono and Kishanda, apart from the high power production at Rusumo itself. But the point is illustrated by showing the various proposed elevations at Rusumo and the possible power production there, as juxtaposed against the areas of the territories to be submerged by the dam and the population to be displaced (Tables 3 to 5).<sup>10</sup>

A number of points are illustrated by the data in Tables 3 to 5: They show that the power output is highest at the highest elevation at Rusumo,

TABLE 3  
Variants of Power Linked to  
Water Surface Elevation at Rusumo Dam

	Installed power (MW)	Guaranteed output (GWh/year)	Inter-annual output (GWh/year)
1. Rusumo 1345 metres	129	535	597
Kishanda	214	1,026	1,125
Kakono	57	259	301
Total	400	1,820	2,023
2. Rusumo 1335 metres	105	410	480
Kishanda	210	820	1,102
Kakono	54	207	286
Total	369	1,437	1,868
3. Rusumo 1325	80	270	374
Kishanda	207	500	1,082
Kakono	53	126	277
Total	340	896	1,733

10. Data derived from Hydropower Development of Rusumo Falls: G-Economic Summary and Conclusions (Tracionel-Electrobel Studies) at 6-8 (June 1979); 3 Development Programme of the Kagera Basin: Final Report; Energy 38 (Kagera Basin Organization and UNDP (Feb. 1982)).



TABLE 4  
Land Areas Likely to be Submerged  
by the Dam at Different Levels<sup>1</sup>

Water level	Total surface area submerged <sup>2</sup>			Usable surface area submerged		
	Rwanda	Burundi	Total <sup>3</sup>	Rwanda	Burundi	Total
1345	52,000 ha	11,000 ha	63,000 ha	17,240 ha	5,600 ha	22,840 ha
1335	33,000 ha	9,000 ha	42,000 ha	8,180 ha	3,210 ha	11,390 ha
1325	20,500 ha	6,000 ha	26,500 ha	2,510 ha	1,220 ha	3,730 ha

<sup>1</sup>These areas correspond to the normal water levels plus an additional 3m.

<sup>2</sup>Not including permanent areas of water (lakes, ponds) already existing.

<sup>3</sup>The area to be submerged is not included in these figures.

TABLE 5  
The Number of People to be Moved and Resettled  
as a Consequence of Backwater at Different Elevations

Water level	Number of inhabitants affected		
	Rwanda	Burundi	Total
1345	22,975	2,975	25,950
1335	10,445	1,610	12,055
1325	2,220	535	2,755

which is 1345 meters, for all the proposed sites. The converse is true at the lowest elevation which is 1325 meters. Correspondingly, the higher the level of the dam, the larger the backwater effect. Therefore, the submerged area of land in Rwanda and Burundi with the additional consequence that the number of people to be displaced is 25,950 and 2,755 for 1345 meters and 1325 meters, respectively. That is the balance of opportunity costs for the hydropower to be produced, plus use of the waters of the dam for irrigation, as against social disruption and relocation.

Given the high population density in the two countries the vehement objection to the higher levels of the dam was understandable. In fact, the controversy threatened the very continuity of the Kagera Basin joint programmes. Fortunately, there was already the framework of consultation set up in KBO for the basin-wide management. On May 9, 1981, the Heads of State of the KBO member states resolved the controversy and opted for the minimum dam which would create a reservoir at a normal operating water level of 1325 meters.

The Rusumo issue also illustrates the fact that one dam can alter the flow regime and have considerable impact on the power potentials of

other possible damsites within the river basin, and at significant distances, as are Rusumo, Kishanda and Kakono. Thus, the reasons for a basin-wide management are clearly numerous and compelling.

### JUSTIFICATION FOR STATE INVOLVEMENT

The discussion of the significance of basin-wide management of rivers and lakes will have suggested some aspects of the justification for state involvement in the operations. In this section, the justification will be discussed in terms of the functional rationale, thereby, analysing some of the problems which necessitate state involvement. The role of the state will, therefore, become apparent.

The breakdown of the items justifying state involvement shows considerable analytic overlaps; at the same time, the items are susceptible to different levels of specificity and inter-relationship. Here, six broad items are found distinguishable.

### Treaty Requirements in International Waters

It has been argued above that the regulation of flow regimes within a river, out of a lake or abstraction of waters for consumptive uses are likely to have substantial physical and socioeconomic consequences for both the upper and lower riparians. Yet, the data shows the unused water resources and their potentials in Africa to be enormous. In fact, it is manifestly wasteful that African states have not taken measures towards complete utilization of the waters for, *inter alia*, irrigated agriculture, hydroelectric power production and navigation through flow regulation and management.

Therefore, it is clear that the African States should undertake regulations and management of the waters of national and international rivers and lakes. It is also evident that the management should be done on a basin-wide basis.

The foregoing two attributes require regional inter-state collaboration, coinciding with the scope of the basin, as a prerequisite. In that context, a regional agreement setting out the precise framework of reciprocal expectations and the protocol for implementation as accepted among the basin states, is a prerequisite. It is only the states that would adopt such treaties in accordance with the national constitutions, and as a function of the sovereign.<sup>11</sup>

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11. Note that some national constitutions permit constituent provinces/states of the sovereign state, to enter into treaties in the specified subject areas. An example in point is the Convention on the Protection of Lake Constance against Pollution, signed by the Land of Baden-Wurttemberg, the Free State of Bavaria, the Republic of Austria and the Swiss Confederation, Oct. 27, 1960, where the first two are constituent states of the Federal Republic of Germany. The text is reproduced in the United Nations Legislative Series, ST/LEG/SER. B/12, at 438 (1963).

The Convention entered into force in Nov. 10, 1961.

There are instances where the appropriateness of a formal treaty becomes an acute problem even if international co-operation is unquestionably necessary. Say, for instance, if the Gaborone Dam, which feeds the capital of Botswana, was to carry so much water that it caused back-water effect flooding the territory of South Africa (and if the latter was to argue that the flooded territory is actually part of Bophuthatswana, a bantustan not recognized as a foreign state, by Botswana), the City of Gaborone, as a legal personality might find it appropriate to discuss the matter with anyone. But the Government of Botswana might find that discourse to be politically embarrassing and unacceptable considering that the so-called independent homeland concept is unacceptable to the UN and OAU. Yet for reasons of viability of the city, its inhabitants and industries, a solution would have to be found. Clearly, only the state can resolve the problem, as a fundamental national issue.

The treaty framework is easier to create before there is a dispute, and disputes are likely to arise once utilization of the waters begin. Once a dispute arises over water uses it is possible for it to end on a war footing, as was suggested by the late President Sadat with respect to the proposed use of waters of the Blue Nile by Ethiopia. In May 1978, the late President was reported to have said that Egypt would not accept any interference with the flow of the water of the Blue Nile, particularly if in its view Ethiopia took such a measure for political reasons.<sup>12</sup> Yet, it is very difficult to ascertain that the motives for any Ethiopian construction is political and not based on vital socioeconomic necessity. Hopes for peaceful negotiation between Egypt and Ethiopia were raised only when the Heads of the two states issued a Joint Communique in Cairo on April 9, 1987. They accepted that as the Nile basin countries, they would promote cooperation, particularly in the field of rational utilization of the waters of the Nile to the benefit of their two peoples and all peoples of the area. Creating a treaty framework is, therefore, a central role of the state and, given the necessity for water management one which should probably be done for every international river or lake in Africa today.

### **The Nature of Water Laws in Different States**

As pointed out already, the central factor in the rivers and lakes management is water. Whether the river or lake is national or international in character, the issue is utilization of the waters by public or private entities within the nation states and such would necessarily be governed by the national laws, which laws may be prescribed and enforced only by the national authorities, according to their respective constitutions.

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12. For further discussions, see Okidi, *Legal and Policy Regime of Lake Victoria and Nile Basins*, 20 *Indian J. Int'l L.* 394, 440 (1980).

There is considerable diversity in the water laws of various African countries, as determined by their juridico-political histories.<sup>13</sup> Countries in Africa include those following civil law or common law and associated jurisprudence. But there are also those countries whose laws are influenced by Islamic jurisprudence. Yet a further category is where the original tribal laws existing prior to colonization have co-existed with the European-derived legal systems. And these legal systems exist in Africa today; at times more than one variant in the same country.

It is sufficient only to point out here that the various legal systems make distinction in matters of ownership and right to use water. For instance, the common law doctrines arising from the English tradition acknowledge only usufructuary right in running water and they generally adhere to the rule of prior appropriation as the governing principle among users. Ownership of riparian lands only permits a right to use public water and to allow it to flow continuously, but not ownership of the water which actually rests in the state. Under civil law traditions, water which comes under the public domain belongs to the public and may not be privately appropriated. But the governing principle is the doctrine of riparian rights which requires interests of all riparians to be protected. Thus, while the doctrine of prior appropriation vests priority in terms of first in time, first in right, the riparian rights principle requires equitable consideration of the rights of all the riparians.

In any event, it seems evident that because of the differences which might arise from the basic doctrines on water ownership or user rights, the state would have a role in the harmonization of the intensified consumptive usage, such as for irrigation or flow regulation to facilitate hydropower production, navigation and use in industries. It seems, moreover, that in each of these legal systems the state has a central role in the regulation and control of use of water as a public resource. Only the state through its laws would properly provide the framework for regulation and apportionment of water among the various contending public and private users.

### **Regulation Necessitated by Broad Base of Water Projects**

Water by its very nature is a pervasive substance; projects involving its utilization such as community consumption, irrigation, navigation, and hydropower production tend to have multiple socioeconomic implications. Very often, those affected might not individually have enough political or economic power to alter the course of events affecting them. For instance, damming for hydropower production or to facilitate grav-

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13. D.A. Caponera, ed., *Water Law in Selected African Countries*, (Rome, FAO, 1979); Caponera, *Water Law in Moslem Countries* (Rome, FAO, 1973).

itational transfer of water for irrigation or to facilitate navigation may each present an opportunity for the other socioeconomic activities. Concurrently, as seen in the case of Rusumo Dam, it may lead to loss of agricultural land and the displacement of population, sometimes in high population density countries, as in Rwanda.

These become socially or economically sensitive affairs which must require the intervention of the political arm of the state. Moreover, even if no detrimental effect is anticipated or created, the very decision to dam a river, for instance, creates opportunities for other positive socioeconomic purposes which an individual might not cherish but which a state might not want to waste. For instance, a decision by a private individual (actual or juridical) to dam a river and use the water for irrigation may create an opportunity for hydropower generation which only the national energy planners may appreciate and only the state can be in a position to coordinate the opportunities.

### **The Magnitude of Resource Involved**

The necessity for a comprehensive and basin-wide management of the waters of a basin seems evident from the foregoing analysis. At the very least, the management should be planned on a basin-wide basis even if the actual implementation is taken in stages. That entails meeting the cost of the studies and eventually for the projects. These can be enormous, and considering the nature of the river or lake basin plans, such costs must fall on the state.

The magnitude of the resources may be illustrated by a couple of instances. The member states of KBO have attempted the ideal comprehensive planning to include studies and implementation of projects in energy, agriculture, transportation, afforestation and health. The total cost is summarized in Table 6.

The total amount, nearly US\$ 3.2 billion, is evidently an enormous amount, even though one might suggest that it could be reduced by less involvement of the state in the implementation of some of the sectors such as agriculture, particularly the rainfed variation, under the drainage programme.

Nevertheless the amount is bound to remain large even in instances where the primary focus is in the construction of the dams but before the infrastructure for hydroelectric power or irrigation are included. In the case of OMVS, the primary plans are for the construction of the Diama and Manantali Dams. By mid-1982, the OMVS was able to raise a total of US\$ 821,816,000, of which US\$ 156,362,000 was for Diama and US\$ 572,319,000 for Manantali, while US\$ 93,135,000 was earmarked as reserve.

TABLE 6  
Summary of the Total Costs of the KBO Programmes

<i>Studies</i>	
Energy	\$19,107,000
Railway	8,586,000
Roads: Primary	28,525,200
Secondary	12,979,200
Industries	180,000
SUB-TOTAL	\$69,377,400
<i>Projects</i>	
Agriculture: Rainfed	\$ 21,200,000
Irrigated	53,361,000
Energy: Dams	575,200,000
Transmission lines	93,240,000
Railway: Construction of network	1,395,663,000
Rolling stock:	556,704,000
Roads: Primary	327,792,000
Secondary	81,120,000
Afforestation	17,207,700
Tse-tse fly	2,511,735
SUB-TOTAL FOR PROJECTS:	\$3,120,999,435
TOTAL COST OF THE PROGRAMME	\$3,190,376,835

Source: *Development Programme of the Kagera Basin: Final Report Executive Summary*, 73 (Kagera Basin Organization and United Nations Development Programme, Feb. 1982).

The above total amount actually represented only 99 percent of the cost of the two dams and the immediately related works. Clearly, then, the total amount is just over one billion dollars; add to that the interest on the loans and the total amount in 1988 could be considerably higher.

The point is that the investment requirements can be enormous if integrated and basin-wide management is to be undertaken. And since most of the investment includes studies and basic infrastructure on which subsequent diverse investments would rely, only the state is in a position to undertake them. That applies to international and, basically, national management programmes.

### **Establishment and Development of Basin Institutions**

Management of water resources as described above requires institutional bases far in excess of what a nation's private sector or non-gov-

ernmental organizations can provide. It requires high level and diversified management capabilities backed by research and institutional infrastructure—to ensure adoption and diffusion of appropriate technology and improved husbandry. A keen observer of the African scene, Professor Odero-Ogwell, has submitted that of all the regions of the world, Africa has the lowest rate of adoption of technological packages in agriculture.<sup>14</sup>

At the very foundation of institutional development is training of manpower, defined as the cadre of human beings *capable* of performing certain productive functions. This is a costly and long undertaking which is to be seen as promotion of the productive value of human resources whether they are later to be deployed in the governmental or non-governmental capacities. Very often, attempts to enhance the performance of a river or lake basin development is hampered by lack of qualified manpower, including agronomic researchers, engineers, managers or extensionists, however one looks at the issue. In a study done by USAID and OMVS for Integrated Development Project, it was observed from the outset that the institutional and implementation problems which must be resolved first, before positive results can be achieved, are:

1. The lack of resources and qualified personnel to carry out extension activities;
2. The lack of logistical support for field agents;
3. A government directed approach to agricultural production encouraging the cultivation of specific crops (for example, rice) at the expense of diversification;
4. The absence of monitoring systems for training and production activities;
5. A lack of understanding of farmers' needs and their participatory role in decision-making;
6. A lack of integration for farming activities, such as cattlebreeding or herding.<sup>15</sup>

These could arguably be called basic institutional questions which can be properly dealt with by concerted action of the state, individually or within a joint framework as was, indeed, discussed with OMVS in 1983.<sup>16</sup> And we can submit here that however vast the available financial resources may be, there will be no success with the development programme unless a competent and stable institutional framework is established.

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14. Odero-Ogwell at 6 (cited in note 6). There are only a few exceptions to this tendency and an example is the diffusion of hybrid maize seeds in Kenya which moved with amazing speed.

15. USAID/OMVS Integrated Development Project, III Analysis of the IDP Training Component, Project No. 685-0621 at 4 (1982).

16. See generally, an outline in OMVS, High Commission, Training and Human Promotion Directorate (Dakar, 1983).

### **Meeting the Requirements for Basic Infrastructure**

Basic infrastructure to support the management of river or lake basins include roads, railways, telecommunication facilities, laboratories, navigational support equipments, among others. They are generally akin to the institutional requirements and their construction and establishment is a proper domain of the state.

The state may, in fact, plan to establish the basic infrastructure and later to use various devices of rent and taxation to recover part of its investments from non-governmental or public commercial entities which may enjoy the use of the infrastructure. In fact, the state should consider as a serious option exempting only the essential social service institutions, such as hospitals and community water supply points.

### **SOME CRITICISMS OF STATE PERFORMANCE**

This section's principal purpose is to raise a number of caveats to state involvement in the management of river or lake basins. In the process, it may in fact point to other roles of the state not discussed above. Moreover, most of the points raised below are interrelated; the breakdown is designed for emphasis and analytic purposes. In their discussion, the problems are being posed for research to ascertain ways of ameliorating them and the promote effective management of African basins. The following illustrative points are raised:

#### **Over-politicization of Institutions and Programmes**

Involvement of the state in any matters is, *ipso facto*, a political matter; therefore, by actually accepting a state role in the management of river or lake basins, the political role is automatically implied. The political element, in fact, will be present in most of the points that can be raised in this section.

The problem, however, arises when political considerations supercede all else, in institutional and programme matters. Very particularly, the over-politicization of the institutions commences with the determination of personnel to be employed on the basis of political patronage to the exclusion of merits and expertise. It is also possible that those who have the expertise in the relevant areas may be made to understand that it is not the professional qualifications that have earned them the jobs, but they are proper clients of the patronizing politicians, or in the alternative, plain nepotism.<sup>17</sup>

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17. In this case, the employee would be required to belong to Friends, Brothers or In-laws (FBI).



The critical question here is one of a politicized appointment which is subsequently backed by political protection of the employees. Its consequence is that the appointee is aware that it is the political, consanguineous or affinal loyalties and protection, and not excellence in professional performance that will insure the job. Such are the persons who courageously resort to the misuse of office, unfair enrichment, misappropriation of resources, and negligence of the assigned responsibilities. Very often, the resources of the institution are squandered on unnecessary or unofficial travels, including maintaining tight contact, or even performing political duties for the patron politicians at home to the neglect of the assigned headquarter duties. It may not be a surprise that in such cases, executives of this kind will ignore or frustrate any assigned deputy, knowing only too well that a deputy might be informed and able to reveal the irregular practices if he has access to the official correspondence. This leads to collapse of morale and apathy in the professional and support staff, with fatal implications for the organization.

These characteristics often emerge in regional organizations, whether they be drainage basin organizations or simply trade and service organizations where states are parties. Similarly, they are found in parastatals at a national level. The executive officers act with impunity because they understand that even if pressure had to result in their removal, they often suffer no penalties for their offences against the community. To this the exceptions are extremely rare.

In the case of the Niger Basin Authority (ABN) a great deal seems to be concealed behind the reported criticism of its executive secretary by the Council of Ministers meeting held at Niamey on August 10–11, 1984.<sup>18</sup> The eloquent understatement reported that the meeting decided to create an *ad hoc* commission to evaluate the performance of “the executive secretary not having fulfilled the expectations of the member countries.” It was nearly unanimously agreed that the poor performance of the executive secretariat had undermined credibility of ABN vis-a-vis the member states and the international financial institutions. As a consequence, financial contributions and donations were not forthcoming. Perhaps a decisive and instructive action will be taken at the end of the review, but again, this depends on the role which the states, particularly that of the nationality of the executive secretary, decide to play in the matter. It may, in fact, vindicate the thesis stated here by protecting the official concerned.

The member governments of the Preferential Trade Area for Eastern and Southern African States (PTA) seemed to have evinced firmness and

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18. International Rivers and Lakes at 12 (A newsletter by the DTCD, United Nations, New York, No. 5, June 1985) has only a brief report on a Meeting of the Council of Ministers held at Niamey, Niger, Aug. 10-11, 1984. These problems were evident for more than a year.

prudent action, in one respect, on what may be called the "Spend thrift Affair." The man who was appointed first secretary-general of the organization worked for only eleven weeks by which time a meeting of the Council of Ministers was able to conclude that he "lacked the highest standards of integrity, efficiency and technical competence expected of him. . . ." <sup>19</sup> Audit reports of the finances were also ordered, because part of the accusations raised were that the secretary-general had conducted himself contrary to the required standards of frugality, thriftiness and prudence. But the action that might be taken in event of confirmed impropriety was not stated; he was summarily dismissed. But the pertinent question must be, how was a person who evinces these characteristics appointed to the job in the first place?

A more interesting and rare course of action seems to have been taken by the states, members of the West African Economic Community (CEAO) where three former officials were reportedly taken to court on trial on charges of embezzlement of funds while they were in office. <sup>20</sup> They were no political dwarfs: the main accused, Mohammed Diawara, a former Ivorian Planning Minister, is alleged to have stolen the equivalent of US\$ 14 million belonging to CEAO, and shared with the Senegalese, who was the organization's secretary-general, and a Malian. The three were arrested in an exceptional event during the October 1984 summit at Bamako and sent to be kept in custody at the Burkinabe capital, which houses CEAO headquarters, until the trials were to begin on March 25, 1986.

It is often expected that embezzlement of that magnitude is actually encouraged by the alleged political patronage. And lessons from the CEAO experience can be elucidated only by the knowledge of what happened to the old patronage in each case.

One national level instance of a decidedly disastrous programme in river basin management is the Bura Irrigation Scheme in Kenya. The small programme conceived in early the 1970s to settle 60,000 people (5,000 families) over an area of 6,700 hectares [ha.] was to be implemented with a consortium loan of US\$ 91.7 million from the World Bank, Dutch and the EEC. <sup>21</sup>

On a surprise visit to the scheme on January 21, 1986 the President of Kenya was riled by the scheme which he called a disgrace. He found

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19. Report of the First Extraordinary Meeting of the PTA Council of Ministers, PTA/CM/XT (Nov. 2, 1983).

20. The matter is attracting wide international publicity. See *The Kenya Times*, Mar. 17, 1986, at 8, col. 3, and Mar. 25, at 8, col. 1.

21. See Overview by Barbara Gunnell, *The Great Bura Irrigation Disaster*, in *African Business* 18 (London) Magazine Editorial Comment (Apr. 1986). For the specific views of the President see coverage in *The Kenya Times*, Jan. 22, 1986, at 1; and Jan. 28, 1986, at 9; and Feb. 18, 1986, at 4.

eroded irrigation canals, abandoned plots, poor crops, tumbled down and unsanitary housing, zebras grazing on irrigated land, and a general air of desolation and decay. Some of the problems seem to have originated from the inception of the programme. And the President ordered the dismissal of the general manager, who was a political appointee, but it took nearly fifteen years before that could be done. In any case, if some of the problems were recognizable at the inception of the programme, what happened to the purportedly rigorous World Bank pre-investment appraisal machinery? Why did the Bank ride along with the disaster for so long? Is it conceivable that a commercial or other form of non-governmental institution could have continued to pump the money in a venture of that kind for nearly fifteen years but not the World Bank?

### **Tendency Toward Proliferation of Institutions**

State activities tend to encourage proliferation of institutions even where such institutions are parasitic on the resources of others. One functional line which could be accomplished by an existing institution would often be to have another institution set up for it, and this happens at national and international levels alike.

On the question of irrigation, for instance, Kenya has about eight public agencies involved. In many provinces there are National Irrigation Boards, a development Authority, and Provincial Irrigation Unit, all at work. Eventually, considerable resources are dissipated in administrative overhead costs rather than operational activities.

This is a general syndrome which is manifested with different intensities in different regions. In central, eastern and southern Africa, there is the PTA, which perhaps coincides, in part, with Lusaka-MULPOC, SADCC, Gisenyi-MULPOC, Kagera Basin Organization, The Great Lakes Community, and the East African Development Bank. Then lately, there have been arrangements to create a PTA "bank." It is highly questionable here if all the MULPOCs are necessary for the development objectives. Similarly, the developmental value of the Great Lakes Community is questionable within the regional context. Having Rwanda and Burundi keep Zaire company within the geo-political arrangement in the region might not make much sense. But, evidently, Kagera Basin Organization is a vital institution. Within the PTA context, one might suggest the use of East African Development Bank, in an expanded form, as being more appropriate and efficient than setting up a new PTA Bank in Bunjumbura. Further considerations could be given to the use of existing institutions in the region because expanding such institutions should be economically cheaper and more efficient than setting up new ones.

In West Africa, a 1982 study mandated by the United Nations Economic Commission for Africa found that the major obstacle to integration in the

ECOWAS region is the existence and varying objectives of a multiplicity of intergovernmental organizations in the area.<sup>22</sup> The study found that there were more than 30 such organizations with some of the countries belonging to more than 20: Senegal—20; Burkina Fasso (Upper Volta at that time)—22; Niger—25. And there were 16 organizations on the subject of natural resources management alone.

The effect is that the large share of the available resources goes to servicing the permanent secretariats of organizations which have no resources left for developmental programmes. Very soon the states are unable to justify continued use of taxpayers' money to service institutions which have no development work to justify their existence.

Only states with taxation powers and limited accountability can proceed with international institutions to that extent, especially if some of the institutions are used only to reward political proteges, friends and relatives of those in power, with lucrative salaries and benefits. African governments will want to be deliberate in keeping down the number of institutions and hopefully, the number of employees, to assure cost-effectiveness in development matters.

### **Mix-up of Economic Exigencies with Political Prestige in Projects**

All governments would wish to be powerful and carry some prestige and ostentation around them, and within the state. It has been argued that in a number of aid programmes, the goal has been for showy projects which are conspicuous to the public, even if they are not the most socioeconomically logical ventures. The United States posed such an argument at the time of the construction of the Aswan Dam in Egypt and Tanzania-Zambia railroad. The precise line is difficult to draw and the argument is often dismissed as blatant prejudice. But perhaps in some cases the argument may be verifiable and only caution should be raised here.

In the case of OMVS some commentators have argued that it was not necessary to construct two dams:<sup>23</sup> The Manantali could have regulated the flow of the water permitting year-round navigation, irrigation, hydropower production as well as to prevent salt water intrusion upstream. They conclude that it was perhaps for the prestige of the Senegal, vis-à-vis Mali, that the Diama was to be constructed: The Manantali Dam is on the territory of Mali; Senegal was to have one too, at Diama, for the prestige of the respective states.

It is also argued that in its haste to construct the showy projects, the states tend to overlook such socially vital matters as rigorous environ-

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22. UNECA, *Proposals for Strengthening Economic Integration in West Africa* (Addis Ababa, 1984).

23. See *Dangers of Haste on River Senegal Projects, West Africa 2083* (Oct. 23, 1978).

mental impact assessment and the human aspects of the projects with the clear consequence that the projects fail.<sup>24</sup>

An economic exigency which is often overlooked in the haste to construct the project is the cost of the capital borrowed for the project and how it can be repaid. The Bura Irrigation Scheme is classical in this regard. The total loan was US\$ 91.7 million. But the President officially declared the project "a disgrace, a failure and the height of mismanagement." He then concluded that the real losers are "the future generation of Kenyans, who will go on paying the World Bank interest on the loan." The haste is partly verified by the fact that even the soil quality is not what was assumed at the beginning. Somehow the haste overwhelmed the World Bank too, a fact which confirms that this problem could arise anywhere. But it is not excusable.

The financial requirements for the OMVS and KBO are clear from the section Magnitude of Resource Involved (discussed above). And if some aspects of the projects be for political images, rather than meeting economic requirements (with the investment in social services being clearly distinguished), the implications can be far reaching and perhaps only a state, oblivious to canons of accountability, could proceed so recklessly.

### **Over-centralization of Institutions**

This seems to be the one folly of state involvement in drainage basins development with the most serious and far-reaching implications. Horror stories seem to recur in most of the instances that have been surveyed in Africa. The KBO, as a recent beginner, still awaits the stage of implementation and reviews to show if it departs from the existing trends.<sup>25</sup>

The OMVS as a development authority is going through the latest attempt at implementation. But the earlier record of management of the Senegal Basin underscores the folly with distinction. Accounts have been given of the work of SAED, the parastatal authority in Senegal, responsible for organizing farmers and irrigation programmes in the Senegal Valley. As recently as April 1975, there were meetings held with the villagers' association for collective agriculture and visitors from the SAED accompanied by French agricultural technicians.<sup>26</sup>

The evidence from the account is that the "experts" from SAED and the villagers were strangers to one another; they were not effectively

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24. See comments by Sophie Bassis, *Recalculating River Development Cost: The Case of the Senegal*, CERES 21 (1982); and Adrian Adams, *The Senegal River Valley: What Kind of Change?*, 10 Rev. African Pol. Econ. 33 (1977).

25. Egypt and Sudan have not been covered in this study. They have the most extensive experience in irrigation in Africa, while on the other hand, Su-Saharan Africa is just beginning.

26. Adrian Adams, *The Senegal River Valley: What Kind of Change?*, 10 Rev. African Pol. Econ. 33 (1977).

communicating and evidently the villagers did not fully understand what SAED officials wanted nor were they interested in joining SAED because the role of SAED had not been clearly explained to them.

The management was totally inefficient, to say the least. While the original estimated cost was about US\$ 13–14,000 per irrigated hectare, the eventual cost averaged between US\$ 40,000 and US\$ 50,000 per irrigated hectare.<sup>27</sup> This is in stark contrast to the reported cost in Mali, where a World Bank project costs around US\$ 26,000 per hectare, under Sahelian conditions.

The condition in Bura was permitted to continue for about a decade. And the pertinent question is whether it had to take a surprise helicopter visit by the Head of State to change the trend. A summary of one of the findings of the President was that:

The project managerial control was over centralized in Nairobi which resulted in major weaknesses in the procurement of materials, delayed reaction to the crises on site, poor financial and budgetary controls, and misapplication of project funds.<sup>28</sup>

Finally, the President ordered that the project would, henceforth, be managed from Bura.

This is important because the record of the National Irrigation Board (NIB) suggested that very often the management was totally insensitive to the woes of the farmers. Accounts from their West Kano project evinces perils and helplessness. A settler at the scheme wrote to the press<sup>29</sup> complaining against the NIB for increasing the costs to the farmers, while paying less for the farmer's output and charging inflated prices for farm inputs. In one paragraph he submits as follows:

Productivity has dropped. Morale is killed. The families affected cannot dress. No education. The farmer no longer believes the scheme was intended for his good. The NIB has become a reject, and it is suspected to be more of a marketing agency for farm inputs and equipment than a development agency. The NIB has impressed us with its devotion to negligence and the skill to frustrate and demoralize farmers.<sup>30</sup>

That is a farmer's description of the performance of a parastatal agency involved in a river basin development scheme at the national level.

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27. These are figures given by Barbara Gunnell (cited in note 21); they might be on the higher side but they do, nevertheless, underscore the point; estimates given in interviews with some NIB officials put the figure between \$33,000 and 40,000.

28. The Kenya Times, Feb. 18, 1986, at 9, col. 2.

29. See Sunday Nation (Nairobi), Nov. 28, 1982. For additional comments on the Fiasco in the West Kano Scheme of the National Irrigation Board, see Sunday Nation, Nov. 14, 1982, Editorial.

30. Sunday Nation (Nairobi), Nov. 14, 1982, editorial.

As Sub-Saharan Africa goes into river and lake basin development schemes, there is need for close assessment of what is happening with the schemes at the national level. Nigeria is one of the countries which should offer lessons because it has eleven river basin authorities. One indication seems clear, though, that the record of the Nigeria's National Electric Power Authority (NEPA), which gets its power from, among others, Kainji Dam, is not actually glamorous. Although Kainji has a capacity of 760 megawatts, the production level is less than half of that. Besides, indecisiveness kept the 700 megawatt gas-fired station at Sapele from commissioning for over one year.<sup>31</sup> In the end, NEPA became associated with rather unflattering full titles as "Never Expect Power Always" or "Not Even Properly Administered."

It seems difficult to find a river or lake basin authority which has effectively decentralized and devolved authority to local levels of their regions in order to ensure effective implementation of projects through an involvement of the supervisors in the actual work, sensitivity and responsiveness to the needs of the farmers. The Lake Basin Development Authority (LBDA) in Kenya accepts, in principle, that it should decentralize its project supervision and administration. However, the practice is far from realization. By now, the LBDA has had just over two years of actual and serious project implementation. It is expected that its decentralization programme should commence in practice during the third year.

Apart from the follies of over-centralization outlined above the practice also tends to assume that the local farmers are ignorant, irresponsible and passive entities who should simply be directed by the imported "experts," like machines. Very little attempt is placed on the encouragement of local initiatives and inventiveness by the local farmers. Nor do the over-centralized systems bother to mobilize local farmer organizations such as co-operatives, as the actual agents of development. These points come out particularly in the 1975 SAED encounter discussed above. The specific Senegal situation on the matter is elaborated by Thayer Scudder who says that devolution to local levels is often correlated with higher yields and that it increases the effectiveness of the responsible agencies.<sup>32</sup>

But devolution to the local levels and mobilization of producer organizations must, of necessity, be accompanied by a rigorous government role in institution building (including training of experts and farmers) and the provision of basic infrastructure. Granted, experience with co-operative organizations in Africa does not have many success stories to offer. However, its history is short and so long as specific follies of state

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31. See letter from Lagos by Eddie Iron in the African Business, at 12 (June 1984).

32. Thayer Scudder, African River Basins, Institute for Development Anthropology 37 (Binghamton, NY, 1981).

involvement such as politicization and low level of accountability can be remedied, there is some determination in Africa and examples from abroad which suggest positive prospects.<sup>33</sup>

### CONCLUSIONS

The functional justification for state involvement in the management of river and lake basins development in Africa inhere from the socio-economic reasons for that very focus on development. It is further underscored by the established necessity for a comprehensive and integrated approach to the management of the utilization of the water of the basin for, *inter alia*, irrigated agriculture, hydroelectric power generation, navigation, and community and industrial uses of water. It is also a component of integrated development planning that the state should ensure measures to prevent negative environmental impact of the activities within individual basin states or in terms of trans-territorial environment injuries.

The study has outlined some negative practices associated with state involvement in river and lake basin development. It is possible to indicate factors that are most forcefully inimical to possible development: Politicization of the institutions and failure by the government to ensure accountability by those who are in responsible positions. People who know of their political protection tend to retain that as the focus of commitment and to ignore pursuit of excellence in their work. Consequently, they resort to abuse of office, misappropriation, neglect of duties and plain pursuit of comfort. In Africa where a head of the judiciary has been honest enough to accept that corruption in his department "threatens to reach a point of disgrace and uncontrollable destruction to the system,"<sup>34</sup> political clientelism and lack of accountability in the management of the national and international drainage basins can prove fatal to the organizations. The capacity of taxpayers to keep subsidizing the inefficient, wasteful, negligent and corrupt system is obviously finite.

In fact, every drainage basin development authority should work on the basis of achievement targets set by their governing boards. Thereafter, individual executives should retain jobs only on proof of achievement. This rigorous ethic could be an effective part of accountability, and examples exist elsewhere, even though not in basin authorities. On Monday, April 7, 1986, WeiYung-Wing, the chairman of the state-run China Ship Building Corporation, resigned following his company's failure to com-

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33. See a brief account by Francois Huot, *Co-Operatives in Burkina Fasso: A Spirit of Self-Development*; and David Creighton, *Lessons from India: Success, the Co-Operative Way*, 15 *The IDRC Reports*, No. 1 at 22 (1986).

34. Comments by Acting Chief Justice Madan of Kenya on Tuesday, Jan. 21, 1986, in an address to the Coast Province Branch of the Law Society of Kenya. See report in *Daily Nation* (Nairobi), Jan. 23, 1986, at 4, col. 4.



plete on schedule two container ships ordered by a local firm. Financial resources which African states often seek from donor agencies will hardly insure development unless there is also impeccable commitment to achieve public goals, honesty and integrity in the management of public resources, and generally, a community-oriented entrepreneurship.

The point is that in order to succeed, African states must act firmly and ensure accountability from their highest levels before they can expect performance at the farmers' level. In the end, most of the productive work should be done at the local level by the small-scale farmers, collaborating through their organizations or through the local commercial enterprises.

Over-centralization of institutions and management tends to lead to inefficiency; neglect and insensitivity to the farmers; destruction of the morale and initiative of the actual producers; failure to stimulate the participation of the producers and their organizations in procedural and substantive ways; and eventually, the collapse of the programmes in situations where accountability was already scanty.

The state operations may also devolve to the local level in the form of autonomous but associated enterprises working as subsidiaries of the parent institutions. The autonomy of the subsidiaries would cushion the subsidiaries from the financial failures of the parent or sister enterprises and, at the same time, permit the weak enterprises to collapse alone.

The decentralization and devolution of management to the local levels should be accompanied by a systematic institution building to include high level training of experts; training of extensionists; mobilization and education of the farmers as individuals and within their organizations; and the provision as well as maintenance of the basic infrastructure.

There is no substitute to institution building if the development programmes are to succeed. But as a requirement, the organization must be able to train, attract and retain the managerial staff. It is not sufficient simply to train: under the aegis of the Niger Basin Authority six persons had been sent for training with assistance from USAID; four of them had received master of science degrees by mid-1984 but none of them had been employed by the Authority. That was also the Authority where the head of one of the four operational departments<sup>35</sup> expressed frustration at the fact that since his appointment in July 1981, the chief executive had not even assigned him a single project by mid-1984. In fact, he submitted, the chief executive had frustrated every initiative he had taken to build up and execute a project.

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35. The 1980 Act by which the contracting states established the Niger Basin Authority established from Departments: Water Resources; Navigation; Transportation and Telecommunication; Agriculture; Fisheries and Livestock; Administration; Economy and Personnel; plus the Documentation Centre.

It is submitted here that efficient and effective management of the demonstrably abundant resources of the African drainage basins holds a critical key to the resolution of the current African economic problems. This is the case because it would make available two factors behind Africa's crises: indigenous energy resources and dependable agricultural production. It is also certain that with the availability of agricultural production and energy resources, a number of avenues for the transformation of the economic structure is possible beginning with agro-based industries.

For these reasons researchers and policymakers, particularly from Africa, have the challenge of finding the formula for the eradication of the problems of management, and the promotion of a rigorous social ethic of accountability. This is not a sufficient condition, but it is an absolutely necessary condition if development is to be realized.