

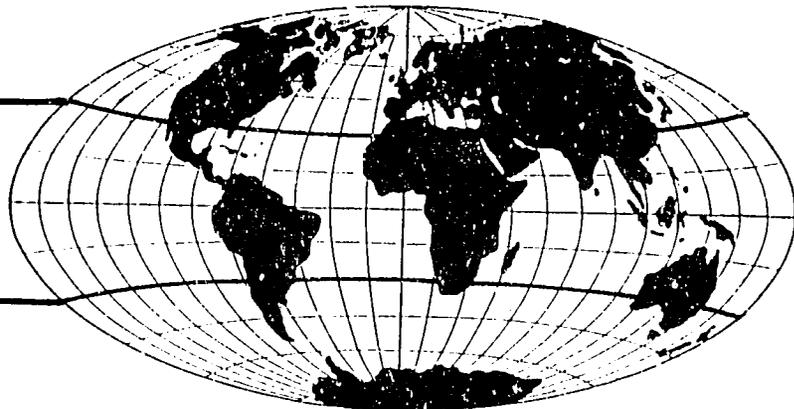
COOPERATIVE AGREEMENT ON SETTLEMENT AND RESOURCE SYSTEMS ANALYSIS

INSTITUTIONAL ISSUES IN
AFRICAN RIVER BASIN DEVELOPMENT

by

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June 1988



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Table of Contents

	Page
Executive Summary.....	1
Institutional Analysis	1
Finding a Methodology.....	4
A Research Tool for Institutional Analysis.....	7
A Description Of the Information Matrix Diagram.....	10
Major Findings from Institutional Analysis of Selected River Basins.....	15
The Tana River Basin in Kenya.....	15
The Lake Victoria Basin in Kenya.....	32
The Volta River Basin in Ghana.....	41
The Pangani Basin in Tanzania.....	53
A Summary of the Major Institutional Issues in African River Basin Development.....	61
References.....	75

List of Tables

	Page
1 The Institutional Framework of Laws and Customs.....	5
2 African River Basin Development Institutional Analysis.....	8
3 Institutional Analysis of the Tana River Basin in Kenya.....	16
4 Institutional Analysis of the Lake Victoria Basin in Kenya.....	33
5 Institutional Analysis of the Volta River Basin in Ghana.....	42
6 Institutional Analysis of the Pangani River Basin in Tanzania.....	54

EXECUTIVE SUMMARY

African river basin development has involved a large number of different institutions, ranging from centralized, modern river basin authorities to local traditional farmers' groups and water user associations. Institutional analysis is, thus, difficult because of the complexity of the differing institutions operating in vastly different arenas. It is, however, an important and generally neglected aspect of river basin planning because the management of the basin is carried out through this complex institutional framework.

This report uses preliminary data from a study of a number of African river basins to set out the patterns of institutional involvement and to classify the main institutional actors. It uses as case studies the accompanying reports on the Volta River Basin in Ghana, the Tana River Basin in Kenya, the Pangani River Basin in Tanzania, and the Lake Victoria Basin in Kenya as basic material for an experimental analysis of institutional development.

A simple information matrix depicts the main historical stages of institutional involvement and provides the information and data on the various institutions--their size, goals, functions, and operations, together with the effects of external events upon them. The diagram allows for comparison over time in the kinds and numbers of institutions involved and shows data on the processes which have affected them.

While data gained from brief field visits is necessarily incomplete, some common problems emerge. Central river basin authorities are usually heavily involved in hydropower production and find it difficult to pay adequate attention to other aspects of basin development. Local institutions tend to lack authority, and some operate independently of other basin activities.

Linking institutions that tie together basin development at different scales are not usually well developed, although their possibilities are indicated by the strength of the regional offices in the Pangani Basin.

It is also clear that each basin has a distinctive pattern of institutional development, and that an understanding of this pattern is very helpful in assessing the current situation and future possibilities. A way forward in some African river basins may best be found by supporting key institutions if these can be identified.

Management of African river basins is the responsibility of many groups acting in a complicated institutional framework. Analyses in the context of that framework are useful tools for more widely effective river basin development.

INSTITUTIONAL ANALYSIS

African river basins have generally been studied in terms of their hydrology, engineering potential for regulation and management, the feasibility of their use for the generation of hydropower, and, often secondarily, their potential for the development of irrigation. When institutional issues have been considered, it has often been in the form of constraints, usually political in nature, which inhibit development programs or interfere with their operation. In many cases, this has been at the macro-level of international politics involving the control of large-scale international river systems, such as the River Nile where a number of countries have vital interests in the management of the waters of the whole basin.

Increasingly, it has come to be realized that institutional issues can be important at many different levels, and that institutions need to be studied not only in terms of their constraints on economic and technical plans but also in terms of their roles as actors in the planning and implementation processes of river basin development. The institutional framework is the essential context within which all development takes place. Institutional analysis in this sense is concerned with how institutions, as organizations and decision making bodies with the power to take actions, plan and carry out their activities in the river basin and what the outcomes of these actions are in terms of success or failure. Institutions include both the large-scale organizations such as the river basin authorities, government ministries or departments, parastatals, and also the small-scale institutions such as local water users or tenant associations. It is the interplay of these many different actors within a river basin that affects the outcomes of all planning and development activity. In Africa, there are also institutions, both large- and small-scale, that

are external in origin. These are the donors of foreign aid projects, the multinational firms and contractors, and the small church groups and other private voluntary organizations. All these actors, foreign or national, have their own mandates and goals. They have their own particular interests, and these are not always compatible with one another. Conflict is often part of the picture.

There is an important justification for an institutional approach to the study of African river basins in the need to find better development models. Too much river basin planning and development to date has failed. Important resources are being ineffectively used. Capital and technology are often available, but it is the institutional capacity and capability that is frequently lacking, and it is the weak or absent linkages among the important institutions working in the river basins that account for so many of the problems. Linkages between national level institutions and foreign donors or between semi-autonomous river basin authorities and their constituent governments are critically important to the functioning of schemes and the management of land and water. Likewise, the relationships among local institutions and between these and the national and international institutions have important and often far reaching consequences for the viability of projects. Institutional analysis can be used to investigate both the operations of the different institutions and the ways in which they interact on the ground and in their use of the water and land resources of the river basin. Such information can lay the foundation for improvements in the planning of river basin development and the rehabilitation of existing schemes presently experiencing management problems.

The inclusion of local level institutions is important because so much development planning to date has tended to ignore these, focusing instead upon

national goals. The effects on local people in the river basins have often been overlooked or dealt with in an arbitrary manner as secondary outcomes of necessary technical changes. People have been moved on to resettlement schemes without proper provision for their livelihood and have, in other cases, been deprived of resources that traditionally have been theirs, often without any compensation. The first resettlement schemes associated with the creation of the Volta River dam are an example of the first, while the situation of livestock herders in the Tana River Basin in Kenya are an example of the second situation.

There has, in fact, been an underlying premise in river basin development that the very existence of local institutions, as regulators of traditional land tenure and water rights, is a brake upon progress. These institutions are assumed to stand in the way of the inevitable changes consequent on the modernization of irrigation and other new forms of land and water management. One study goes so far as to suggest that where such institutions are powerful and, therefore, likely to interfere with progress, the project should be abandoned altogether (Withers and Vipond, 1974). Recently this negative attitude has begun to change, and local institutions are being seen as key actors in development.

In other cases, it is ignorance of local institutions and these regulatory mechanisms for resource management that gives rise to problems. On-going conflicts and frequent summoning of project personnel to national ministerial headquarters to explain or curtail actions can be the unfortunate result of ignoring local interests. Such is the current situation in Tanzania where Japanese donors, setting up an irrigated rice project, have completely ignored the existence of locally regulated water rights. In fairness, it must be said that these rights are seldom documented and such knowledge is hard to come by,

except in cases where local studies have previously been carried out. The issues surface in the field when the project gets underway. This, however, is one of the main points to be emphasized in this study, alerting would-be donors and planners to the need for preliminary field research into local level institutions. For African river basins, research on land and water rights are often the most crucial.

The institutional framework of laws and customs constitutes the essential context within which all development and change takes place, and the organizations that embody these are the actors in the process, regardless of whether or not this is recognized and understood by the planners themselves (Table 1). Institutional analysis, which addresses these issues, is, therefore, more than just another way of looking at river basin development. It is a basic necessity for successful and sustainable river basin management, at least as important as studies of technical feasibility.

Finding a Methodology

The first step is to identify all the institutions operating in the river basin being studied. Institutions are defined in the sense of organizations with the power to make decisions and take actions. They exist at all levels from local to regional to national and international. Institutions of external origin such as the World Bank or the various donors from the international community, including small-scale PVOs as well as foreign government representatives, also play a large part in African river basin planning so that their mandates and ways of operating are also important. Institutional analysis is directed at understanding how these institutions operate and, perhaps even more significantly, with how they do or do not interact. Some institutions can be considered as linking institutions, connecting others either hierarchically or

Table 1

The Institutional Framework of Laws and Customs

1. National laws governing land and water rights
2. National laws governing environmental protection: laws against the pollution of rivers and streams, laws for the protection of watersheds, laws to protect reserves of forest and grazing land
3. National laws affecting people: government authority to move people
4. Regional by-laws
5. Customary laws governing land and water rights
6. Customary laws affecting other natural resource such as forest, woodland, grazing, animals, fishing; ownership, user rights and access
7. Customary laws affecting the mobilization of people for work (who controls household labor? to what extent? how much individual control exists?)
8. Customary laws affecting women's rights to hold tenancies on schemes and rights to income from these
9. Customary laws affecting cash control within the household including who receives the tenancy income and who dispenses it?
10. Customary laws affecting the farming system in terms of crops produced, field lay out, livestock kept, and degree of willingness or ability (given food priorities) to make changes

These are the laws and customs which represent the institutional context within which all development planning takes place.

They operate through institutions as organizations: the offices of government ministries, parastatals, regional administration, scheme managers, tenant associations, water user associations, regional and village development committees, and any other bodies that have the power to make decision, including households.

Conflict sometimes arises between national and customary laws, and among some of the organizations within a region and this also is part of the institutional context of development planning.

Change also occurs both in laws, customs and organizations so that a dynamic exists in practice and current field research is essential to understand this.

horizontally. Such might be cooperatives, marketing institutions, or in a one-party state, the political cells. At the macro level the key institutions will be the river basin authority, if one exists, as well as government ministries, parastatals, utility companies, regional development committees, scheme management bodies, and contractors. At the local level there will be cooperatives, tenant associations, water user associations, village development committees, and at the basic level, households, especially farm-households as producers. It is obvious that there are many actors with their different, sometimes conflicting, goals and operating procedures. Liaison is frequently limited, if it exists at all (Little, 1987:50). Thus, activities sponsored by one institution may interfere seriously with the existing or planned activities of another. In Kenya, for example, the Ministry of Water Development withdraws water from the Tana River to supply Nairobi without either consultation or even a report to the Tana River Basin Development Authority. It is small wonder, in the present circumstances, that the management of land and water resources is often wasteful and inefficient and could be improved by simple cooperation between institutions as much as by new technology or capital investment. This is but one of the many issues that surface in African river basin development and towards which attention is directed by this report.

An important aspect of the institutional analysis is that its history, in the sense of the time sequence of events, is of paramount significance in the understanding of how river basin development has proceeded and how things have come to be the way they are. Over time, the type and number of institutions involved can have changed as well as the relationships among institutions. This is particularly the case where a significant event occurs to break the continuity of economic development, as, for instance, the coming of independence and a change of government. This may involve totally different approaches

to river basin planning or a new set of institutions to carry them out. Existing institutions can also change in nature and role, or they may change their titles while retaining their existing roles. An example of changing relationships is that of the Volta River Basin Authority with the Electricity Corporation of Ghana (previously named the Electricity Department) and suggestions for their amalgamation into one authority. The present solution is to coordinate activities of both under a National Energy Board, raising fears that this will strengthen the power aspects of management further at the expense of other activities, such as irrigation (Quartey, 1987). Changing relationships are, therefore, more than just nominal changes. They can have substantial practical effects.

A Research Tool for Institutional Analysis

Institutional analysis is difficult because we are dealing with complex systems operating at different scales. Each river basin has a particular set of institutions at different levels from international through national to regional and local. How these institutions function and how they relate to one another is the key to understanding how resources, particularly the critical land and water resources, are managed and what human factors are responsible for this. Human resources and social factors in management are as important as natural resource endowments in economic development.

Some existing institutional roles result from historical circumstances, and this may be one reason why some particular activities were undertaken by one institution at one time and subsequent activities developed later and independently by another institution, both continuing side by side for lack of proper planning scenarios based on the river basin itself. Management problems can frequently be traced to independent actions being taken by one institution

Table 2

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African River Basin Development
Institutional Analysis

Time Sequence	Institutions	Mandates/Goals (include official plans)	Functions	Actions: Organizational (eg administration)	Actions: Operational (eg construction)	Unplanned Events (eg natural drought; political and social ccups)	Problems/Issues at Each Stage of Development	Linking Institutions

Institutions are any significant organization with power to make decisions and take action.

at the expense of another. The issues of coordination and integration of planning policies are deemed to be critical for effective river basin management in Africa and elsewhere.

We have experimented with an analytical framework using information matrix diagrams as a research tool for organizing data. One case study, the Pangani River Basin in Tanzania, uses two diagrams, one for large-scale and the other for small-scale institutions, with the final column showing the linkages between these. The other case studies have summarized all the data on one diagram but also include the vital information on linking institutions. Linking institutions are those which bring local institutions into a regional, national, or international system of administration, political organization or marketing, and service distribution organizations. Linkages may be missing or inoperative and weak, while there are institutions at both small and large scales that operate independently. (Some aid projects, for instance, are managed outside the purview of host governments, reflecting the goals of the donors.) A detailed investigation of the degree and form of coordination among institutions working in the river basin is stressed as an important part of this study. Changes over time can explain fundamental aspects of present management policy and operation.

The two dimensions of the information matrix are: the historical sequence of stages that have taken place in the development and management of the river basin (stages that are pragmatically defined in respect of this history rather than arbitrary periods of time); and the information and data pertaining to the various institutions involved, that is, the goals, functions, and operations of these institutions and the effects of external events upon them.

The use of this matrix diagram allows for comparison over time in the numbers and kinds of institutions involved at each stage, data on their

mandates and goals, functions, and actions carried through in terms of administrative actions, and those involving physical construction and other operations. The outcomes of these activities and the problems and issues associated with them can be recorded in a separate column. There is also a column for the documenting of unanticipated or unplanned events which can affect all projects and all development. The information diagram, thus, allows for some comparison among the various river basins, as well as documenting the history of changes that have taken place in a specific basin.

A Description of the Information Matrix Diagram

The first column is used to register the time sequence. Each basin will have gone through an individual sequence of events that has powerful implications for its future course of development. Since all planning and development is contingent upon prior conditions, the whole sequence of events is critical to the analysis.

The second column is used to register the institutions involved in river basin planning at each stage. Clearly, the identification of these stages is a matter for specific investigation in each particular case. In many cases, we see an increase in the numbers of institutional actors involved over time.

A third column is used to set out the mandates and goals of the institutions that are recognized as significant. Mandates include all official plans. Goals may be less well defined but can be ascertained by reference to documents, statements and budgetary allocations. Changes in purpose can then be documented. These might include major changes such as those engendered by a change in government, or smaller policy changes and changes of direction. Purposes may be grouped into primary, and secondary, where appropriate, as in the case of river basin development where planning is frequently multi-objective.

The functions of the various institutions are set out in the fourth column. These may be statutory as in the case of formally constituted organizations, such as the river basin authorities or the different ministries of the national government. They may also be discovered, in other cases, by reference to the workings of the organization. How these and the mandates or goals that operationalize them are actually carried out may then be determined by reference to the subsequent fifth and sixth columns which record actions carried out, again over a period of time. Thus, the fifth column details the organizational actions taken in the creation of new offices, new bureaucracies, or even new institutions. The sixth column deals with operational actions, such as the building of dams and the creation of reservoirs and lakes, the laying of new irrigation pipes and canals, the building of roads or the setting up of ancillary services. By reference to these two columns, it may be possible to determine how far the institutions have stayed with their original mandates, how much they have changed over time, or how far they have taken on new functions or abrogated authority from other institutions. Obviously, not all detail can be shown, but the significant events and actions recorded can be amplified by an accompanying text.

All projects and all development initiatives are subject to the effects of unplanned or unanticipated events. Sometimes these assume a significance that outweighs the most careful plans. Thus, the Sahelian drought of the 1970s had major effects upon the level of the lake in the Volta river basin which dropped to the 249 foot mark, with serious repercussions on power production, and leading to a power curtailment program (Perritt, 1987). Other events may be triggered by political factors or social factors, such as the unexpected influx of fishermen and their families into the Pangani region of Tanzania following the impoundment of the Nyumba ya Mungu reservoir. Unplanned events can have

both immediate and far reaching effects and their documentation is critical for an understanding of the course of development in the river basin. The downfall of Nkrumah in Ghana was a watershed event in the case of the Volta river basin project.

An eighth column is for assessment of the problems and issues at each stage of development. The major outcomes of plans and actions can be recorded and assessed, with the historical record of such development plainly displayed. Again, the full detailed record may have to be consigned to the accompanying text while only the most significant outcomes, problems, and issues be recorded on the matrix diagram.

The ninth column is to record linking institutions. The degree to which institutions are coordinated within a river basin may be one of the most significant factors in its development. Not all linkages are equally significant but some may be crucial. Thus the linkages between the Volta River Authority and the Ghanaian government and between the VRA and the foreign donors are especially critical to the development of the Volta river basin. Indeed, these particular linkages between river basin authorities, national governments, and foreign donors may be singled out as being especially critical for all African river basin development. Divisions of responsibility related to these linkages are also fundamental, as, for example, those between the VRA and the Ghanaian government to deliver health and welfare services to the people in the river basin. The divisions of responsibility also change over time and, in this case, changes are presently being proposed. An investigation of the costs and benefits of these would be a useful part of this study.

In sum, this matrix diagram can be used both as a working document in the field and as a record of the findings for use in the reports. It represents the framework of thinking used for the institutional analysis of African river

basin development as proposed in this paper. It reflects the choice of factors which are the most significant and in what terms they should be analysed.

In four of the case studies, matrix diagrams were used experimentally, in brief periods of field work by different teams. There was no opportunity to compare the methods or results. Consequently, while some results are useful they are essentially incomplete. More data are needed in all cases. Different teams used different versions of the matrix diagram. In one case a diagram was prepared by one author from data supplied in a paper from another (Berry using data provided by Okidi). Comparisons among the various river basins are, thus, difficult to make and also incomplete, although some interesting parallels and common problems emerged.

The identification of these common problems is the basis for a research agenda for the institutional analysis of African river basins set out below.

The components of an institutional approach are prescribed as follows:

1. Analysis of the current roles of the major institutions in the river basin to define existing responsibilities and determine if these involve competing interests or/ and overlapping responsibilities.

These major institutions would include river basin authorities, regional administrative authorities, government line ministries and parastatals and any others relevant to local circumstances.

The goal of this analysis would be the better allocation of responsibilities, coordination among institutions and more integrated development planning.

2. Analysis of the capabilities of major institutions in terms of funding, staffing, and numbers of trained and skilled personnel.

The goal would be the identification of shortfalls.

3. Examination of how power and non-power activities are managed within the basin and what institutional organizations exist for each, and how they overlap or are in other ways interrelated.

The goal would be to determine how these two different sets of activities, with different resource requirements and management needs, can be made complementary rather than conflicting.

4. Analysis of the linkages among national, regional and local institutions to see how information is shared and activities organized and to determine if there is over-centralization that inhibits the dissemination of information or the participation of local people in decision making and management.

The goal would be to detect weaknesses in organization that might contribute to better natural resource management.

5. Examination of the roles and activities of foreign donors, their relationships with each other and with national governments.

The goal would be to determine how donors might be brought into the formulation of national development plans, avoiding the often semi-autonomous project-by-project development that presently occurs.

6. Examination of how environmental effects of development activities are currently monitored.

The goal would be to set up institutions to monitor the environment of the river basin on a regular basis, share information and formulate guidelines for good sustainable management of land and water.

7. In the case of international river basins, examination of the nature and degree of coordination among the various national governments in the management of the river.

The goal would be to improve monitoring and management.

These issues appear to be among the most critical for improving the management of African river basins as it concerns natural and human resources.

MAJOR FINDINGS FROM INSTITUTIONAL ANALYSIS OF SELECTED RIVER BASINS**Major Findings from the Institutional Analysis
of the Tana River Basin in Kenya**

The development of the Tana River Basin has been piecemeal, in the absence of an originating overall plan. In fact, river basin development as such has not been an important goal for the Kenyan government and was not an important goal in 1974 when the Tana River Basin Development Authority was eventually set up. At the present time, despite the existence of a basin authority, now the Tana and Athi River Basin Authority (TARDA, set up in 1981), there is still a lack of integration. Much of what takes place within the Tana River Basin does so without shared knowledge of complementary or conflicting activities or the effects of such activities on water flows and the environment. There are many actors and they operate for the most part, with sectoral and particular interests. Generally, this means there are some instances of conflicting demands for water use, much wasted experience--as knowledge is not transferred from one project to another--and, on the whole, the best use is not currently being made of the land and water resources of the basin. This is the major problem identified in the institutional analysis of the Tana River Basin (Little, 1987; Kimani, 1987).

In extracting the lessons of experience from this general study of African river basin development, with a view to improving future efforts, it is important to understand the reasons for this mode of development in a specific basin and to see why it continues into the present. Only a thorough investigation of the actual development path can bring real understanding of the existing situation.

: Time	: Institutions	: Mandates	: Actions	: Actions	: Problems	: Unplanned	: Linking
: Sequence	:	:	: Organizational	: Operational	:	: Events	: Institutions*
: Pre-Independence : (1963)	Households/Prison- ers	Survival					
:	European farmers	Commercial agr.					The whole admin ap- paratus of the country.
:	Eur. Farmer Assoc. - KFA - K Coop Cream- eries - Mktg & Reg. Boards	Support Comm Agr					Int'l capital & markets.
:	M.O.A. Af. Land Dev't. Board	Promote African small farmer irrigation	Irrigation Sector Study	Mwea & Hola Schemes	Centralized decision- making	Floods/Droughts	NGO's

Table 3

Institutional Analysis of the Tana River Basin in Kenya

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: 1963-1981						
: 1967	Nat Irrig Board	Manage ALDEV schemes				
: 1970	DANIDA	Irrig. Devel. Proj.		Garrissa Irrig.Dev't Prog.	Highly centralized	
: 1971	UNDP	Feasibility study of a river basin authority.	Form TRDA		Low/neg c/b ratios	
: 1974	TRDA (Tana River)	Develop hydropower; plan integrated dev't.			No local offices (only Nairobi)	Idi Imin in Uganda
: 1977	MOA (Small-scale irrig unit)	Design/construct small farmer irrig. schemes.			No in-house capacity for socio-econ work nor monitoring & evaluation.	Min of Water Dev't Coops (50+)
	TARDA	Incl.Athi River plng			Inadequate coordination w/MOENR, county councils, etc.	Irrig. Com's. County councils
	BDC's					
: 1981	TARDA	Incl. Athi Rvr plng				
: 1983-1986						
: 1983-1986	Nat. Irrig. Board	Implement & Plan basin development	10-year plan	Projects in hydro-power, irrigation, fish & livestock, natural res. mgmt.	Lack linking institutions	
	TARDA	Coordinate TARDA			Costs & Complexity	NCCK
	Inter-min Com. BDC's				lack master plan	NGO's
	MOA - irr. & drainage branch					Nairobi water scheme
	Donors	Design/Construct Projs.				County Councils
						Multinationals
						Group ranching
						Livestock projects
					Poor collaboration	
					No local training	

Table 3 continued

In one of the papers on the Tana River Basin, Little stresses the historic specificity of this development, the very particular context in which the institutions involved in river basin planning and activities arose and subsequently changed over time. There is a universal lesson that the evolution of institutions has a strong bearing on their current forms, functions, and relations with other institutional actors. Very few institutions in the world are created in an ideal sense, with a clear mandate, sufficient financial and management resources to carry this out, and a clear pattern of development following this mandate. Mandates are frequently not adhered to, and institutions change in character and composition over time. So there is a firm purpose in studying institutions in their historical context both in Kenya and elsewhere.

This is the methodology followed by the authors of the institutional analysis of the Tana River Basin, and their findings shed light on the origins of the issues that have now become major obstacles to effective river basin management in Kenya. Most of these issues are related to the absence of an integrated plan for development and the ways in which this allowed institutional actors to carry on without regard for national or local priorities. Ultimately they can be traced to ambiguity concerning these goals, particularly with respect to river basin development. The river basin authority, TARDA is now a quasi-independent parastatal after being affiliated at different times with the Office of the President and four different ministries (Little, 1987, 18).

The major institutional issues in the present development of the Tana river basin can be examined under five headings:

1. the lack of a plan for integrated development;
2. the lack of coordination, both among national level institutions and between national and local institutions;

3. the existence of special interests, many with powerful influence, including foreign donors;
4. the lack of data collection and inadequate sharing of information, and
5. the negative effects of current centralized planning models for projects that effectively exclude local institutions.

The Lack of a Plan for Integrated Development

Development of the Tana River Basin in the sense of harnessing its water resources for power and for irrigation began in response to certain circumstances rather than as a purposeful design for river basin planning. Thus, the setting up of TRDA in 1974 was less a reflection of national interest in river basin planning than a reaction to events in Uganda that threatened Kenya's power supplies, 70 percent of which came from Uganda at that time. The development of hydropower was the main agenda of TRDA, all else was secondary. Political events in a neighboring country had a critical effect on national goals, demonstrating the importance of looking at unplanned events in understanding development paths.

The mandate for TRDA, and later TARDA, goes far beyond this single goal. Long-range planning was envisaged, and the full use of the basin's resources, not simply the water resources for hydropower, was intended. The language is plain and speaks of the need for monitoring of projects and the cooperation of all agencies concerned with the abstraction and use of water. Data collection for planning purposes is also mandated (Little, 1987:15-17 for details). It is necessary however, to look beyond the documents to see why development has not proceeded in accordance with this mandate.

The original goal of energy production from hydropower continues to shape the pattern of development in the Tana River Basin. Past priorities and past

events are often behind current policies even when new needs have begun to surface. Such is certainly the case in Kenya where a growing awareness of the importance of irrigated agriculture is still not reflected as seriously as it should be in practical planning for river basin development. Despite much discussion and the initiation of many projects, 91 percent of the budget outlay of TARDA still goes to hydropower. In the proposed development plan 1986-1996, hydropower plus irrigation account for 99 percent of the budget with the allocation to hydropower remaining the same (Little, 1987:31).

This emphasis on hydropower has been a prominent feature of African river basin development, despite or even because of the high capital expenditure it entails. This is because hydropower justifies such expenditure to willing foreign donors, the chief funding agencies. This has been noted in all sections of this report, and the limitations of the hydropower emphasis on broader forms of economic development have been stressed repeatedly.

Despite the comprehensive language of the legislation that created the river basin authority, TARDA has not carried out the planning, monitoring, and coordinating activities for the basin, as was intended. There is still no master plan for the basin. Efforts at producing such a plan started in the 1970s with the work being carried out mainly by expatriates, but so far there has been no useful product. Projects are initiated without regard to any overall planning. Dam construction at Masinga and Kiambere, for example, has been carried out without consideration of the effects on existing irrigation systems (Little, 1978:29-38). Ten-year planning documents are produced, but these are little more than lists of projects. TARDA's planning role has never been fully realized.

Since 1980 TARDA has also become involved in large-scale, capital intensive, agricultural projects in the basin, similarly undertaken on a project by

project basis without any overall plan. As an implementing agency, subject to outside influences through its reliance on foreign donors and expertise, TARDA has lost much of its credibility as an authority to oversee basin development. It is not seen as either a mediating or coordinating organization but as one of a number of powerful institutional actors involved in the river basin. Its name suggests a different comprehensive role, still unrealized. In the case of TARDA, these failures have resulted in conflict, some of which are conflicting interests among its own projects. The mere existence of a river basin authority must, therefore, not be taken to indicate comprehensive basinwide planning. Investigation of history and performance is needed to understand the realities of river basin development.

It is not so much the lack of a planning document as such--many of which set ideal, rather than practical, guidelines--but the lack of feasible and effective coordination among the institutional forces at work within the river basin that contributes to the underutilization of resources and poor results of many projects.

The Lack of Coordination at the National and National/Local Levels

The Tana River Basin includes the largest proportion of irrigable land in the country, some 200,000 hectares, and its productive development is very important for the future of Kenya. With a very high rate of population growth (4 percent per annum, World Bank Report, 1987) and much of the country in arid and semi-arid environments, Kenya needs to look to irrigation for significant increases in food production. There has been a consequent re-emphasis on agricultural development within the basin.

The first important large-scale irrigation scheme in the Tana River Basin

was the Mwea Scheme. It remains one of the most successful. Again, historical circumstance is significant for understanding its development. The initiative came from a desire to find resources for African farmers during the Mau Mau rebellion that led to independence, and, in fact, it was Mau Mau detainees who were conscripted to work on the scheme during the 1950s by the then colonial government. An important institution, the African Land Development Board (ALDEV) was given the task of implementing the scheme which was based on irrigated rice production. Subsequently, the Ministry of Agriculture took over, and after 1966, the main institution was the National Irrigation Board (NIB) when the project was seen less as a political, and more as an agricultural, enterprise. A broad range of other ministries and other institutions, including churches, have become involved in the scheme, and, as Kimani notes, these were "coopted or created" as the need arose (Kimani, 1987). There was no comprehensive plan but a trial and error approach. The Provincial Administration, through the office of the District Commissioner, maintains a coordinating role and has been known to mediate between the management and the farmers, as in 1985 when the farmers rejected double cropping.

Neither the Mwea scheme nor the Hola scheme, which was intended to serve the interests of African farmers in the middle Tana, were part of any planned basin development. The first basinwide survey, carried out in the 1950s by the Ministry of Agriculture, was no more than a search for new irrigation sites, many of which are now part of the current plans of TARDA and NIB. However, there is little connection among any of these schemes. Similarly, government support for private commercial activities in the basin is related to specific investments. It has been noted that the setting up of TRDA in 1974 was in response to the need for hydropower development rather than irrigation, and it should be noted that irrigation schemes were already in existence when it was

set up.

A natural resource inventory of the basin by TRDA, using British expertise, was carried out in 1974-77, mainly to identify dam sites and areas for small-scale irrigation projects in the Upper Tana. A simulated computer model of the Tana flows for hydropower development purposes was produced by this team in 1975 and recently updated with help from a Dutch team of experts. The latest model included an irrigation component (Little, 1987:26). These efforts focus on the collection of information for specific projects rather than on basinwide planning.

Conflicting interests in the basin arise therefore from the piecemeal nature of its development, tied to this specific, historic pattern. The continuation of the problem, however, is due to the continuing lack of coordination exhibited between the various actors in the economic development system still emerging. Thus, while the original conflict of interests between the management of projects in the Upper Tana basin with those downstream continues, the competing claims between hydropower and irrigation for resources continue, and the ambiguity in development goals put forth by the Kenya government continues to affect the ways in which the basin is managed.

But these are not the only issues related to lack of coordination or the absence of linking institutions. In addition, it is important to recognize other significant issues. These are a function of the lack of coordination at two, perhaps three, levels. The first is the national level, since TARDA is a national level institution, a parastatal. Its headquarters are in Nairobi and it has no offices in either the provinces or the districts. It is no surprise, consequently, that its record of linkages with other national institutions is better than with local or regional institutions.

In line with TARDA's emphasis on energy and hydropower, its linkages with

the Kenya Power and Light Company (KPLC) are the closest, both financially and operationally. The sale of electricity generated at the Masinga Dam to the KPLC is the major source of revenue for TARDA. Full details of the cooperative relationship between these two institutions are given in Little (1987:41). The authority is also well coordinated with the Ministry of Water Development, from which it received hydrological data on the basin, and the Ministry of Agriculture, where it has liaison with the Irrigation and Drainage Board (IDB) for project planning and feasibility studies. The coordination with IDB, however, is far from satisfactory and reveals a picture of incomplete liaison since schemes proposed by TARDA are in competition with those sponsored by IDB.

At the national level, a major conflict exists between TARDA and the National Irrigation Board. The activities of each of these large-scale institutions have been managed independently of the other. The reasons for this are partly rooted in history, since the NIB's major schemes on the Mwea and the Hola were set up 20 years before TARDA was established. They are also due to some well recognized problems with the NIB, notably its failures on the newer scheme at Bura in the middle Tana. The authority has a better record, though part of this results from its liaison with and reliance on foreign donors. Currently affiliated with the Ministry of Energy and Regional Development, TARDA operates independently of the ministry and can solicit funds directly, either from the treasury or from donors (Little, 1987:18). The authority is in some respects taking over from NIB, especially where large-scale projects are involved.

The authority's relationships with foreign donors, such as the Japanese and Dutch in the delta region, and heavy reliance on expatriate technical assistance and skills also become issues in coordination at the national government level. Another set of problems is being created since priorities

are being set by foreign donors rather than by the national agencies. The type of project and its organization are being determined by the donors themselves. Failures to develop local Kenyan expertise or to involve Kenyans in the schemes for training or consultation also follows from this mode of development. Lack of coordination between government and donors is very serious because of the loss of national control which this entails. For a parastatal to act independently, as the weaker institution, subverts efforts at national planning. The Kenyan government needs to reassert its authority here and take more responsibility.

There has been some collaboration between TARDA and the Ministry of Environment and Natural Resources and with the National Environment Secretariat, but consultation is limited despite the fact that large-scale irrigation schemes and dam construction have serious and long-term effects upon the environment. Environmental impact studies are not required by Kenya's laws. Where studies have been made, it has been at the request of donors, and the studies have been carried out by TARDA itself and not by independent authorities. The authority has felt free to ignore the findings.

At local levels, the lack of coordination with national institutions is more striking. Coordination between TARDA and local authorities is extremely poor. For instance, the District Development Committees are frequently ignored. Even when TARDA projects are likely to have large-scale effects on a district, the local authorities are not consulted. Neither is TARDA aware of, nor interested in, existing local projects (Little, 1987:44). This is the case even though the Ministry of Finance and Planning, which is responsible for the DDCs, is one of the few ministries representing local organizations that is found on the governing committee of TARDA. Other important ministries, such as the Ministry of Cooperatives and the Ministry of Culture and Social Affairs,

plus the Ministry of Local Government, are not even given a voice on the TARDA committee. Thus, this weak linkage with the DDCs is the only one that has official sanction. The DDCs, moreover, have problems of their own, such as lack of funds and weak organization.

The lack of coordination with the Ministry of Local Government is demonstrated in the case of the Nairobi water scheme. The municipality of Nairobi is planning a dammed reservoir on an upper tributary of the river Tana which will more than double the amount of water supplied to the city, yet, TARDA has not been consulted about this project (Little, 1987:47).

Also at the local level, there is a lack of liaison with the small-scale efforts of the non-government organizations (NGOs) whose projects often coexist with those of TARDA, or of the DDCs, and they are in no way coordinated with either of these. The results are evident when activities elsewhere, such as the construction of the Masinga Dam, affect their projects unfavorably. Small-scale projects at Garissa were adversely affected by falling flood levels associated with this dam, but those involved were not advised nor consulted.

The authority has little or no contact with cooperatives, water user associations or other local level institutions such as the group or cooperative ranches. This disregard for local level interests has negative effects on local people such as herders who are displaced from their grazing zones in the delta by large-scale irrigation schemes. Protests go unheeded. The land is deemed to be state owned and the herders are ignored. This disregard for local interests is also in part attributable to the influence of foreign investors who deal with national rather than local authorities (Kimani, 1987). The authority also acts in accordance with its position as a national institution for national planning, and this is presently seen as a priority overriding local interests.

It must be noted that this situation is not confined to Kenya nor to this particular river basin, but it is a common occurrence. Local people, especially the farmers and herders, often have their rights and interests ignored, while grandiose development schemes fail through lack of cooperation. It is a lesson that has not been learned.

The Existence of Special Interests

The existence of powerful special interests at work in river basin development is a point made by Little and supported by Kimani. Institutions often serve sectional or factional interests and some of these have more pull and greater access to resources than others. Thus, in the case of the Tana river basin, the highest levels of investment have been to date in the upper parts of the basin, previously controlled by the powerful European settler farmers in alliance with the then colonial government and later the independent African government. The livestock herders in the middle and lower parts of the basin have historically had the least voice. The strongest institutions are associated with the interests in the upper basin.

In this scenario of conflicting interests, there are many actors at government level today. The various institutions set up by the government, ministries, departments, parastatals, also have their own agendas. National priorities come into play affecting the relative importance of these institutions at different periods.

Lack of coordination between government and donors is one major problem but there is another, equally serious problem since it also results in wasted resources and conflicts of interest, and that is the lack of coordination among the donors themselves who also have their specific agendas. It is by now apparent that the donors are major institutional actors in the Tana river

basin. There are very few instances of joint projects and the donors have worked independently of each other. The result is projects that compete for resources rather than contributing to the overall development of an area. For example, in the delta region Japanese and Dutch funded projects are in conflict or where there is even conflict between Japanese volunteers and the large-scale projects of Japan Aid and TARDA. Recession cultivation promoted by the volunteers is likely to be interrupted by the large-scale schemes. Among the various Dutch funded projects, there is little coordination or sharing of information so that a river morphology study undertaken by Dutch Aid and TARDA was not known to either IDB or to its Dutch advisors, although its relevance for the effects of upstream activities on the lower basin where Dutch Aid and IDB are funding important schemes is obvious.

A significant factor emerging from all this independent activity, plus the ways in which individual donors relate to particular Kenyan institutions, such as TARDA, IDB, NIB, and others, is that this reinforces separateness among the Kenyan institutions, another factor in the piecemeal manner of river basin development.

The Lack of Adequate Data Collection

Related to the above issues of piecemeal planning and lack of coordination is another major issue, the lack of a system for adequate data collection and the sharing of information collected by the various institutions. Increasing levels of economic activity call for increasing levels of information if resources of land and water are to be well managed. Future problems may be avoided by the sharing of information acquired by the different projects. At present, there is no satisfactory system of data collection in place for the basin as a whole.

The Tana Authority itself does not have the capacity to collect its own data. Even basic hydrological data is acquired from the Ministry of Water Development and is then reinterpreted for project purposes. The mandate to collect data was part of the initial legislation (Little, 1987:16), and although the need for more in-depth hydrological data is recognized by the institution, its present capacity is limited. Past records of morphology and hydrology for the river are inadequate. The situation is being remedied and the number of gauging stations is to be increased. The Authority collaborates to some extent with the Ministry of Environment and Natural Resources which collects data on soils, catchment management and reforestation, to protect its own hydropower investments. However, advice has not been sought from the ministry when dam construction or irrigation projects are under discussion. The lack of a monitoring and evaluation unit within TARDA is a serious deficiency in terms of data collection and again represents a failure to fulfill its original mandate. With regard to social data, TARDA has little interest in this and does not have a social scientist on its staff.

Clearly, there are limits to what one organization can do and there may be better ways to deal with the collection of data and with monitoring and evaluation, but so far there is little attempt to systematize this either in-house or through collaboration with government ministries and donors. The data that has been collected for a particular project is too often kept in the separate filing systems associated with that project. In this, as in other aspects of development, institutions involved in river basin planning and in economic activities within the basin maintain separate management systems.

It has been suggested in other studies on river basin development in Africa, that regional data banks would be effective as components of regional planning and that the tendency to keep all records in centralized and compart-

mentalized government files militates against good data management. The need for this in the case of river basins, where hydrological unity is an issue, is logically obvious, but national governments are not used to organizing information in this way so that considerable restructuring would be necessary. This means, however, that there is even more need to work towards the sharing of data and information among the institutions active in the river basin.

The Exclusion of Local Institutions from Centralized Project Plans

Irrigation, by its nature, involves some degree of discipline in the matters of water management and allocation. Nevertheless, it is widely felt that the Mwea model, as it is called, goes too far in its regulation of farmers (Kimani, 1987). Mwea is the oldest and most successful of the irrigation schemes and has set the management style, though the origins of this approach lie as much with the particular historic circumstances of its inception--as a project to employ detainees during the Mau Mau Emergency--as it does with the imperatives of water management.

The National Irrigation Board, which now manages Mwea, is the institution that typifies this highly centralized, top-down, approach to project management. Legal sanctions on farmer behavior are enforced through the use of the Irrigation Act. Tenants have a renewable one year lease and are under orders from the NIB concerning all aspects of production. Despite attempts by the farmers to organize themselves in their dealings with the NIB, particularly through the Mwea Amalgamated Cooperative Society, this has had very little effect on changing the attitudes of scheme management.

The Tana and Athi River Development Authority, the major institution in the river basin today, also follows this model, and the deficiencies of it are

all the more significant in that it has been the institutional model for all the other river basin authorities in Kenya.

There does appear to be a new interest in participation by farmers exemplified in the involvement of the district development committees in Kenya but so far, changes are few (Kimani, 1987).

There is no doubt that national level institutions, not local ones, have had the greatest impact on development in the Tana river basin (Little, 1987: 66). This is why it is so important to understand the institutional model by which they operate.

Conclusion

In examining the major institutional issues arising in the Tana river basin, a major conclusion is that national and international institutions have played the dominant role in its development and that the interaction of these institutions is a significant factor in the way that development has proceeded, in a piecemeal, uncoordinated fashion. The existence of a river basin authority (TARDA) has been no guarantee of planned and integrated development due to the nature of the institution and its history. It has not functioned in accordance with its mandate but has remained committed to a primary interest in hydropower development and a later function as an implementing agency for large-scale, highly centralized irrigation schemes which has compromised its credibility as an overseeing institution for the river basin. Its independent relationships with international institutions, such as the donors, by-passing the Kenya government, further compromises its role as a national river basin authority. Likewise, it operates independently of many other national level institutions and nearly all local ones.

This same pattern of separate organization and management characterizes

the other national institutions involved in the river basin, each actor following its own agenda, so that conflicting interests and overlapping responsibilities get in the way of good sustainable resource management for the basin as a whole. Besides TARDA, the major organizations are the Ministry of Agriculture, the National Irrigation Board, the Ministry of Water Development, the Kenya Power and Lighting Company, and the Ministry of Livestock Development. The latter has a limited role despite the fact that this is an important region for livestock.

One author suggests that TARDA should concentrate on overall planning for the Tana river basin and delegate executive and implementing functions to the NIB and the Ministry of Agriculture for irrigation and to the Kenya Power and Lighting Company for hydropower projects (Kimani, 1987:44). Current problems with the NIB, however, are likely to hinder such moves. The clear need for better overall management remains the most crucial issue in the development of the Tana river basin.

Major Findings From The Institutional Analysis Of The Lake Victoria Basin In Kenya

The Lake Victoria basin is one of the largest drainage basins in the world and, although Kenya's share is about 8.4 percent of the total, it is the largest amount of freshwater available to Kenya. It figures prominently in Kenya's plans for development, particularly through irrigation.

Good quality land is limited in Kenya where two-thirds of the territory is classified as rangeland so that irrigation brings new hope for increased agricultural production, essential to feed a growing population. Out of a present total of 3 million hectares of cultivated land, only 31,130 hectares is irrigated. The full potential for the country is estimated to be over 540,000

Time Sequence	Institutions*	Mandates/Goals (*include official plans)	Functions	Actions: Organizational (e.g., administration)	Actions: Operational (e.g., construction)	Unplanned Events (e.g., natural droughts; political and social coups)	Problems/Issues at Each Stage of Development	Linking Institutions
Pre-Independence Before 1963	Small farmers Households	Family support	Production of food crops	Family labor	Family farms using irrigation techniques in Kene plains and Mingo in South Mwanza.	Seasonal and yearly variation in flows. Soil erosion		Colonial Government Administration District Officers.
1963	Kenya Freedom from Hunger Council (KFHRC)	Coordination of work of voluntary agencies in promoting food production, raising funds, education on nutrition and malnutrition.	Stimulate public interest - support. Provide liaison between voluntary agencies (local and international) and government's agricultural institutions. Create employment opportunities for rural population.	No resources of its own - no exports. Recruits people and raises funds. Works with NGOs. Works with Ugamba project. Worked with Rongo Mynova (unsuccessful). Worked with Myardus which is successful.	Identifies projects and mobilizes support. Supplies materials and extension services. Small but productive self-help schemes. Many different types - irrigation, school feeding, vaccinations, etc.	Potential land tenure problems where rental terms unclear.	Lack of long-term commitment to projects. Need to involve beneficiaries more in projects. Need to train local people to take over. Rongo Myagova project failed for this and political reasons (cf. Ugamba which was successful.)	FAO Kenya Government NGOs Australian Freedom from Hunger Campaign FIU
1966	National Irrigation Board (NIB)	Law of Kenya Chapter 367. To take charge of large-scale national irrigation projects. To raise funds, coordinate settlement, provide land, organize markets and create employment. Devise and carry out policy.	As described by Mandates-Goals. Management to start with 3 pre-independence schemes: Mwaia Perera and Galole (ALDEV Schemes).	Expansion to manage new large-scale schemes through acquisition of land by NIB (except for Bunyala). Farmers are tenants. Highly centralized decision making. Bunyala, Ateri, and West Kene estates.	Creation of large-scale estates. Largest consumer of water - per ha irrigated. Some attention to environment - use of biocides in irrigation water. Electric power generation by pumps.	Seasonal variations in rainfall - floods and low flows. Also yearly variations. Soil erosion	Overcentralized - rigid. Few inputs from farmers. Low returns and poor results. Dependence on expatriates - lack of training for locals. Little concern for farmers. General perception of poor performance.	Mainly linked to government.
1969	Farmers Committee at Bunyala	Liaison with management	Limited powers because of high degree of centralization.	Low participation	Revolt against 2 crops per yr. mandate. This requirement was dropped in 1978.	Broken pumps in 1987.	Malaria and bilharzia health problems. Pressure on farmers by NIB.	

* Institutions are any significant organization with power to make decisions and take action.

Table 4

Institutional Analysis of the Lake Victoria Basin in Kenya

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Time Sequence	Institutions	Mandates/Goals (include official plans)	Functions	Actions: Organizational (e.g., administration)	Actions: Operational (e.g., construction)	Unplanned Events (e.g., natural drought; political and social coups)	Problems/Issues at Each Stage of Development	Linking Institutions
1970	Private farms on lakeshore	Family support and local sales	Production and marketing	Low key - little organization. Some farmers groups - Akerl farm.	Canals constructed to take lake water to gardens. Some use of diesel pumps.		Conflicts over land. Health problems.	Extension services
1974	Nyandus: Womens' Group	Income generation by farming. Payment of school fees. Investment in more land.	Production and marketing of vegetables. Mostly women + some help from family.	Farmers Committee manages the group. Farmers contribute funds.	Canals, dykes and drainage. Use of diesel pumps.		Few recorded.	Assistance from Ministry of Water Development Extension services KFFBC
1977	Small-scale Irrigation Unit (SSIU)	Created to promote small-holder irrigation and drainage throughout Kenya. Dutch assistance.	As described by Mandates/Goals Located at first in Min. of Agric.	Merged with ARID program to form Irrigation Drainage Branch (IDB).	Under the IDB new system of Provincial Irrigation Units were later established (1978).			Linked to ministries
1978	Provincial Irrigation Units	Promotion of small-scale irrigation - not initiation of projects but support.	Provincial level operations. Technical unit.	Works with donor support. Dutch, Italians, Germans, and Danes.	Surveys and technical design.		Too much donor control. Some inappropriate interventions - e.g., Saka Bundo - where technology introduced hastily - imposed.	Linked to IDB of Ministry of Agriculture
1979	Lake Basin Development Authority (LBDA)	Established by law - Chapter 442 Laws of Kenya Broad mandate responsibility for all development projects in western Kenya. Also to develop all water resources from rivers flowing to Lake Victoria.	To develop agriculture, irrigated and rainfed. Irrigation only one among many functions. Others include hydropower, fisheries, land reclamation, health services, beekeeping, livestock, bricklaying.	Planning major irrigation works. Two important ones are Kimira and Oluch. Use of Dutch technical assistance for reclamation and flood control.	Yala swamp project. Escape basis of management with paid workers. Rongo Nyagova project -- failure due to lack of farmer participation and political factions.	Possible concerns over inter-basin water transfers at international level in future. LBDA has the statutory responsibility to deal with this. Political factions have effects on projects.	Estates as enclaves, not integrated into local farming systems. Potential for employment creation, however. Lack of interest in training local farmers in irrigation skills. Intention to look at environmental impacts of irrigation but lack of procedures so far. Political factions locally as a factor in failure.	Ministry of Water Development. Ministry of Agriculture Dutch Government donors.
1982	Self-help Groups. Format - Women major component Example is Ugamba	Register with District Development Committees Local initiative and control. Complex of projects with precise planning.	Construction of irrigation works with voluntary labor and finance.	206 women farmers organized in 8 groups. Each group makes its own decisions. One overall committee makes final decisions. Construction by groups but all plots are individual. Marketing is also individual.	Construction of irrigation works with voluntary labor at Uyamba, Nyandusi, Nongo, Nyagova, and Saka Bundo. Production of horticultural crops on lakeshore of Nyanza Gulf. Construction of canals, dykes and drainage. Bucket irrigation, no pumps.		Failure often due to interventions by PIU and LBDA. - Subverting local initiative. Rental terms vague for land - could lead to problems.	District Development Committees PIU, LBDA and KFFBC. PIU assists with surveys and design of irrigation Extension officers act as advisors.
1985 - 1987	Self-help groups without formal registration	Atandi, Mango, Kamuga, Alungo Private decision making on crop choices. Voluntary labor - family.	Irrigation of small plots by canals and bucket watering. Drainage of swamps in some areas.	No organization though farmers groups exist. No systematic records. Small planning committee at Alungo, organizes work.	Vegetable farming for local sale and consumption at Atandi. Rice at Mango.	Water in streams at Mango often dries up in summer. Seasonal irrigation only. Potential problems for downstream users at Alungo as swamps are drained in upper reaches.	Land tenure conflicts. Health problems. Problems in marketing of sugar cane at Alungo - farmers switch to rice.	No support in region from agencies above, but some at Atandi from local polytechnic. Some help from PIU in design at Mango.

Table 4 continued

hectares under irrigation and of this some 350,000 hectares would be in the Lake Victoria basin. This would include both the area around the lake and the irrigable lands of the six rivers that drain into it. Clearly, the management of this resource is of great importance to Kenya.

The Lake Victoria basin is international. That means that regulation is not solely a matter for Kenya but also involves Tanzania, Uganda, and, since the lake has an outlet at Jinja to the River Nile, Sudan and Egypt. So far the use of water by Kenya for irrigation is too small to have serious implications for other riparians, and there is no treaty in existence to govern this (Okidi 1987:58). Demand, so far, has been low in comparison to water quantity but it could be a problem in the future. The Lake Basin Development Authority is charged with the responsibility for monitoring operations and dealing with international issues.

Kenya's main interest in the basin is for irrigation rather than power though the basin authority is given responsibility for a broader range of activities that include hydropower. The falls at Jinja are the major source of hydropower in Ugandan territory but also supply electricity to Kenya. The Kenyan share of the basin is in the shallow area of the Winam Gulf (4 to 15 meters in depth) where six large rivers bring in quantities of water and silt requiring careful management since there are great variations in seasonal flows and volume. The present amount of irrigation in the basin is small. There are three schemes managed by the National Irrigation Board, totaling 2,140 hectares and other small-scale schemes totaling 1,400 hectares (Okidi, 1987:5-6). Water quantity is not yet a constraint.

The major institution in the Lake Victoria basin in Kenya is the Lake Basin Development Authority (LBDA), modeled on the Tana and Athi Rivers Development Authority (TARDA), but, unlike TARDA, involved in the creation of a

master plan for the integrated development of the basin. In this, the institution was assisted by the Japanese International Cooperation Agency, demonstrating again the dependence of Kenyan institutions on foreign expertise and funds.

The LBDA was established in 1979 and has a comprehensive mandate to deal with all the development issues of the region and to oversee the use of all rivers that discharge into the lake. Its many functions include livestock projects, bricklaying, beekeeping, health services, hydropower production, fisheries, land reclamation, and irrigation, as set out in Chapter 442 of the Laws of Kenya. So far, its actions, in all respects, have been limited, not by natural resource constraints but by lack of funds and lack of skilled manpower. The only project related to irrigation that it has undertaken is the reclamation of the Yala Swamp, where maize and millet seed multiplication is being tried and citrus fruits and coffee seedlings are under cultivation. This reclaimed area is about 2,300 hectares. Expansion could involve two further areas of 9,200 hectares and 6,000 hectares (Okidi, 1987:43). However, major irrigation works are planned for the future.

The Yala Swamp project is managed as an estate with paid workers and it is questionable whether this management model is best suited to irrigation development in the area. Much needs to be done to involve local farmers and, even where the LBDA has taken part in projects based on participation, its intervention has been disastrous. This was the case at Rongo Nyagowa where intervention meant ignoring the people already at work and providing inputs that gave the institution visibility but which were not suitable for the system of cultivation already instituted on a self-help basis. There is a suggestion that one of the problems was lack of preparatory work and a rush to secure some donor investment ahead of organizational planning.

The LBDA is interested in two more schemes at the present time, one at Kimira and one at Oluch, both based on swamp reclamation and totaling some 3,200 hectares. No institutional arrangements have been announced for the organization of these schemes, but it is important that experience is taken into account and the mistakes at Rongo Nyagowa be avoided. Institutional failures in management are costly and this is a major issue in the development of the Lake Victoria basin in Kenya at present.

Failures in management plus a heavy reliance on foreign aid and failure to develop training schemes for local personnel bring both long- and short-term problems. Unfortunately, they are not confined to this particular institution, the LBDA, but are characteristic of many other Kenyan institutions.

The oldest institution in the lake basin is the National Irrigation Board (NIB), set up in 1966 as a statutory body within the Ministry of Agriculture. Its main purpose at that time was to take over the three large-scale irrigation schemes established before independence and to promote further schemes of this type.

In the Lake Victoria basin, the NIB has three schemes, Bunyala, Ahero, and West Kano. They cover 213, 1,348, and 1,228 hectares, respectively, and involve a total of less than 2,000 people. Except for Bunyala, the NIB projects work on the basis of land formally acquired by the Board. The farmers are tenants without assured tenure. Even in the case of Bunyala, the NIB exerts strong centralized control. The site and the farmers participating are chosen by the NIB and all major decisions are made by the Board in respect to cultivation, water management, pricing, and marketing. The farmers have little say in any of this. Farmers committees exist but have little power (Alila, 1986). Management problems are evident in all of these schemes.

The NIB is generally perceived as a failure and the criticisms leveled

against it are: over-centralization and the remoteness of head office, lack of skilled manpower (technical and managerial), poor incentives for farmers leading to lack of long-term commitment from them, use of expatriates and lack of training for local replacement, poor levels of participation by farmers in decision making, financial losses, and little attention to farmers' welfare.

Essentially, the potential for successful irrigated agriculture in Kenya generally and in the Lake Victoria Basin region specifically has not been realized and institutional failure in management stands out as a major reason for this. Failure to involve the farmers in management and to mobilize their energies is at the heart of this problem. The rigid management style of the scheme authorities makes farmers feel regimented and ensnared while low economic returns turn them against the idea of irrigated agriculture which involves hard work and low opportunities for investment. Thus, management style is a key factor in poor performance and poor acceptance of irrigated agriculture.

A different management model is represented by the Provincial Irrigation Unit (PIU) which, however, has a very small institutional role compared to the other institutions described. Basically, it supports a number of small-scale projects in the basin. This institution does not initiate or manage projects but is a technical unit in the Irrigation and Drainage Board of the Ministry of Agriculture. As such, it extends technical support in the choice of pumps, design of schemes, land surveys, and other activities to small holders interested in developing irrigated agriculture. These schemes, a number of which have been set up by women's groups such as the Ugambe Women's Project on the shore of the Nyanza Gulf, show better performance in irrigated agriculture, better records, and often have good group management. They are, however, essentially very small projects involving anywhere from 40 to 500 farmers. The

proceeds are frequently used mainly for school fees for children and domestic expenses. As local self-help projects, they depend on local markets. Of the projects of this type investigated by Okidi in 1987, only one, at Seko Bondo, was a failure and this was attributed to political friction occurring during an election campaign. This demonstrates again the absolute importance of farmer cooperation and initiative in irrigation projects. Details of these schemes can be found in Okidi (1987).

While the Provincial Irrigation Unit has a better record as an institution, it is not without its problems. Here the issue is also one that crops up frequently in river basin management, and that is the involvement of numerous donor agencies and the dependence of local institutions, such as the PIU, on foreign expertise. In Kenya, Dutch, Italian, German, Danish, and Japanese donors are among those involved. Foreign interests control policy as well as influencing operations.

Nevertheless, it is suggested that the PIU model is the one with the best potential for project support and that its resources and its role might be expanded. There is a PIU in each province in Kenya and operating at this level is clearly an important aspect of successful project management since the institution can deal with and support local initiatives more easily with a local presence.

Another institution with a local presence but a very different purpose is the Kenya Freedom from Hunger Council. The KFFHC was established in 1965 with the goal of coordinating all the efforts of voluntary agencies interested in food production, raising funds for food-related activities, supervising their expenditure, promoting education against hunger and malnutrition, stimulating public interest and support, and providing liaison among voluntary agencies, both local and international, and with the government agricultural institu-

tions. The Council works directly with local groups in planning projects and organizing resources. It has no resources of its own nor does it have the necessary experts. Both are solicited from its counterparts abroad at FAO and elsewhere. This limits its role but, nevertheless, it plays an important part in linking government with local institutions and in representing the NGOs at government level. It is said that between 1965 and 1983, the Council had supported some 193 projects involving a range of activities, including cattle dips, dairy schemes, fishing, water projects, irrigation, training in agriculture, and school feeding programs. The Council has been criticized for lack of long-term commitment to these schemes and also, in some cases, for failure to involve the beneficiaries sufficiently in their own projects, so that it has not escaped the frequently noted shortcomings common to other institutions in the lake basin region. Like the PIU, the Council does not initiate projects but gives assistance to them and to do this, insists on formal registration with the District Development Committees and the Department of Social Services.

What emerges from a study of institutions in the Lake Victoria Basin is that the four institutions described here, the LBDA, the NIB, the PIU, and the KFFHC, have the largest rôles and the greatest visibility. The District Development Committees, and the other district offices of the various ministries, some of which do not have local offices in the region, appear to be less active. Farmers' organizations seem to have little voice. The self-help groups, which are active, get support from the PIU and the KFFHC. Where local initiative and control is lacking, there is a noticeable lack of success. Large-scale projects undertaken by the NIB and the LBDA are unsatisfactory. Elaborate plans for irrigation are not accompanied by practical organizational methods. Neither resource management nor environmental protection are given enough attention (Okidi, 1987:62).

In short, the major findings are that in a region where the main interest is currently in irrigation, that is, in land management and agricultural skills rather than in water management for power, the basic institutional network is weak. Local institutions are weak and there is little effective liaison between these and national institutions. To make matters worse, the national institutions themselves are often ineffective, as is particularly the case with the NIB, and there is poor coordination among them.

The dominance of foreign donors in technical management and the failure to train local people to take over project management means that the longer term outlook is bleak since the withdrawal of funds or expatriate experts can lead to stagnation and failure. So far, development has been sporadic and dispersed, with little overall planning and almost no attention to the future, particularly to the well-known likely consequences of irrigation to health and to the ecology of the region. The reason matters are not yet urgent is that activity is small in relation to the water resources available and so problems are only just emerging and are seen as such by outside experts rather than by the people or the Kenyan government. The local people tend to have an understandable focus on their own small areas, while the government is busy working out a national irrigation policy but has yet to concern itself with the aspects of regional management.

Major Findings from the Institutional Analysis of the Volta River Basin in Ghana

The key institution in the Volta river basin is the Volta River Authority (VRA), established in 1961 as the sole internal institution responsible for the development of the river. It was set up and remains as a semi-autonomous and self-operating organization. Appointments to its board reveal much government

Table 5.

Institutional Analysis of the Volta River Basin in Ghana

PHASE	OFFICIAL PLANS	INSTITUTIONS	UNMET NEEDS	SIGNIFICANT DONORS	GOALS	FUNCTIONS	CRITERIA FOR SUCCESS	OUTPUT OR OUTPUT	RESPONSE TO OUTPUT
Colonial Phase (Pre-Independence) 1940-1956	The White Paper (1952)	British Colonial government			<ul style="list-style-type: none"> provide energy and means to exploit basins attract investors 	<ul style="list-style-type: none"> est. a sound business venture out of idea of dam construction 	<ul style="list-style-type: none"> amount of financial backing acquired demonstrate technical feasibility and economic viability for Akosombo dam 	<ul style="list-style-type: none"> Alcan of Canada and Bico of Great Britain show interest colonial gov't becomes actively involved sets pattern of transnational capital involvement 	<ul style="list-style-type: none"> stirre interest in colonial government to survey dam sites by Mr. Halcrow and Partners and produce White Paper AIDW acquires controlling interests
					<ul style="list-style-type: none"> development of Volta River hand over power but maintain advantages through trade agreements 	<ul style="list-style-type: none"> create administrative process envisioning independent Ghana 	<ul style="list-style-type: none"> Hydropower production and aluminum production representation of Britain's economic interests 	<ul style="list-style-type: none"> survey propose; plan Noruzh concurs with plan 	<ul style="list-style-type: none"> accepts responsibility to develop project formation of Preparatory Commission further negotiations
	The Preparatory Commission Report (1953)	<ul style="list-style-type: none"> Convention People's Party (CPP) led by Kwame Nkrumah The Preparatory Commission appointed by Colonial Gov't 			<ul style="list-style-type: none"> lead Ghana's independence achieve economic development through industrialization - which highlights Volta power scheme investigate the technical economic and human aspect of project make specific proposals 	<ul style="list-style-type: none"> represent national interest in the negotiation process and promote Volta scheme for independent Ghana 	<ul style="list-style-type: none"> social and economic development of Ghana and greater inter-regional econ. cooperation long-term economic benefits to Ghana 	<ul style="list-style-type: none"> pursue negotiation process for dam construction 	<ul style="list-style-type: none"> Preparatory Commission Report
Planning Phase (Independence) 1956-1960	Kaiser Reassessment Report (1959)	Kaiser Aluminum and Engineering Corporation	Reduction in total costs	U.S. UK	<ul style="list-style-type: none"> modify plans of Preparatory Commission Report to reduce costs 	<ul style="list-style-type: none"> act as engineering consultants and business partners 	<ul style="list-style-type: none"> economic viability and technical feasibility of project indicate financial soundness and sufficient econ. returns 	<ul style="list-style-type: none"> more narrow scope - single purpose focus Electric utility using style plan attractive and acceptable to international donors and engineering firms 	<ul style="list-style-type: none"> World Bank and other make commitments; Kaisers and Improprio sign contracts
		Int'l Bank for Reconstruction and Development (IBRD)			<ul style="list-style-type: none"> appraise project of financial, economic and technical soundness draw up a financial plan 	<ul style="list-style-type: none"> offer financial advice indicate financial soundness to rest of lenders, donors 	<ul style="list-style-type: none"> acceptability of terms by all parties concerned 	<ul style="list-style-type: none"> financial agreement finalized 	<ul style="list-style-type: none"> move to construction of dam
		Volta Aluminum Co. Ltd of Ghana (VALCO)	Withdrawal of Baco, Alcan, Alcoa, and Olin Holdings; Involvement of U.S.		U.S. export-import bank U.K.	<ul style="list-style-type: none"> operate the smelter and aluminum processing part of project increase production over time 	<ul style="list-style-type: none"> take charge of smelter operations 	<ul style="list-style-type: none"> ability to expand production and generate income to Ghana in order to meet repayment schedule on loans negotiated favorable power tariff rate 	<ul style="list-style-type: none"> produce aluminum on competitive basis for world market
	Government of Ghana	Falls on development of vertical aluminum industry More dependence on VALCO		World Bank	<ul style="list-style-type: none"> spur industrialization through Volta River Development reduce dependence on econ. revenues and on U.K. transfer control to Ghanians create appropriate national river authority 	<ul style="list-style-type: none"> mediate in negotiations on Volta River Project draw outside support 	<ul style="list-style-type: none"> economic independence extension of electrification 	<ul style="list-style-type: none"> successful contracts of international technology for hydro-power dams initiates construction of one of Africa's first large-scale hydro-power projects 	<ul style="list-style-type: none"> must maintain and create new bulk electricity consumer markets to retain econ. solvency of project

Table 5 continued

PHASE	OFFICIAL PLANS	INSTITUTIONS	INTENDED EVENTS	SIGNIFICANT DONORS	COMS	FUNCTIONS AND SECONDARY OBJECTIVES	CRITERIA FOR SUCCESS	OUTPUT OR OUTPUT	RESPONSE TO OUTPUT
Institutionalization of Volta River Project 1961-1965	Kaiser Reassessment Report, Volta River Development Act (46) - 1960. No major major basin wide plan, master plan, etc.	Volta River Authority (V.R.A.) To some extent the power goals and functions are shared by the Electricity Corporation of Ghana -ECG. Both are part of the Ministry of Fuel and Power	Downfall of Nkrumah (1966) does not alter VRA as institution 1981-1983 drought	Mozambique Project IDRD World Bank US AID Export-Import Bank (U.S. I.E.) Kpong Project: Small Arabia Kuwait Arab Bank for Development in Africa (BADEA) Canadian International Dev. Agency CIDA - also funds Acres International European Dev. Fund European Investment Bank World Bank African Dev. Bank (ADB)	<ul style="list-style-type: none"> spur Ghana's econ. and industrial development by supplying power reduce dependence on imports for energy to plan, oversee and manage the development of the Volta River to divert responsibility for non-power activities to line ministries, departments and existing institutions 	<ul style="list-style-type: none"> generate electricity for general and industrial consumption, esp. for smelter operation operate a transmission system regulate and control water flow and license withdrawals for domestic water supplies and irrigation 	<ul style="list-style-type: none"> establish cost effective planning/management system to operate Volta River Production-transfer cost efficient non power activities wherever possible or appropriate ability to repay loans and derive profit from sale of electricity foreign exchange from export electricity mitigate potential adverse effects on people and health 	<ul style="list-style-type: none"> construct and operate hydro-power dams increased consumption of electricity by bulk consumers; increased domestic significant drop after 1981 because of rainfall shortage picks up after 1985 plans and design for 3rd dam at BUI-no donors 	<ul style="list-style-type: none"> continued support from donors for expanding grid much less gain in rural electrification VRA assumes RTI responsibility by equalizing transmission system to North Ghana; World Bank implements a power system rehabilitation project in 1985
						<ul style="list-style-type: none"> provide landing facilities and assistance for developing fishing potential development of water transportation on lake and operation of vessels on the lake provide health and safety services along lakeside and in townships carry out and supervise two resettlement schemes -Mozambique and Kpong engage in research and assist institutions affiliated with research in order to monitor socio, physical, biological and econ. change 	<ul style="list-style-type: none"> increase fish production establish economic viability for Lake Transportation scheme stem spread of diseases associated with lake creation relocation of displaced population promote new livelihood systems 	<ul style="list-style-type: none"> constructed the Kpong-Torkor marketing complex; promoted better fish processing methods; installed new smoking sheds; provided new fishing gear and boats small-scale pilot project collaboration of VUR and DP with UNEP and WHO on a disease control program Mozambique resettlement scheme -largely unsuccessful; Kpong Scheme - construction of villages part of project creation of VUR and DP with temporary duration establish pilot projects in dry-season agriculture 	<ul style="list-style-type: none"> transfer of Kpong-Torkor management of operations to Fisheries Department creation of Volta Lake Transport Company continuation of health programs necessary Need to monitor - due to Schistosomiasis Problem other institutions not well-equipped to carry over responsibilities, CEC does not assume active coordin. difficulty in handing over functions, in some cases pilot projects abandoned or picked up by NCD's
						<ul style="list-style-type: none"> Canada CIDA (ACRES management consultants) 	<ul style="list-style-type: none"> establish commercial farm enterprise for Irrigation Kpong Farms Ltd. 	<ul style="list-style-type: none"> financial feasibility does it make profit without subsidy 	<ul style="list-style-type: none"> cost effective only for exporting rice good management (expat.) & expensive inputs results in profit. some subsidy thru import concessions
<ul style="list-style-type: none"> World Bank 	<ul style="list-style-type: none"> implied potential to expand power system to serve West Africa: Togo, Benin, Burkina Faso, Ivory Coast, Nigeria 	<ul style="list-style-type: none"> agreements and funding to expand system outside of Ghana 	<ul style="list-style-type: none"> 1972 - Service to Togo and Benin 1984 - Interconnection with Ivory Coast 	<ul style="list-style-type: none"> 1985 - consider direct inter-connection with Nigeria 1985 - consider service north to Burkina Faso 					

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Table 5 continued

PHASE	OFFICIAL FLAG	INSTITUTIONS	UNPLANNED EVENTS	SIGNIFICANT DONORS	GOALS	FUNCTIONS	CRITERIA FOR SUCCESS	OUTCOME OR OUTLET	RESPONSE TO OUTCOME	
Implementation and Management Including "Hindling Over" Policy	Volta River Development (Act (46)	Volta Lake Transport Company	<ul style="list-style-type: none"> decline in lake traffic drop in water level 	<ul style="list-style-type: none"> German GIZ Netherlands Denmark KFW (West German Dev. Bank) 	<ul style="list-style-type: none"> to create a large-scale, commercial transportation system 	<ul style="list-style-type: none"> manage and operate lake transportation system 	<ul style="list-style-type: none"> ability to repay investment increased traffic ability to solicit international funds 	<ul style="list-style-type: none"> low level of traffic carriage and passenger service difficulty in maintaining and management reliance on donors & expatriate to finance and construct infrastructure 	<ul style="list-style-type: none"> Increase donor support German Gov't. and Development Bank finance build-up of port infrastructure at Akosombo and Duipe construction of lake ferry transports should increase lake traffic 	
		Irrigation Development Authority		<ul style="list-style-type: none"> FAO African Dev. Bank 	<ul style="list-style-type: none"> contribute to growth of Ghana's agricultural sector through irrigation 	<ul style="list-style-type: none"> exploit potential for irrigated agriculture without building large schemes to benefit dry northern region, and alongside lakeshore 	<ul style="list-style-type: none"> increase yields, production of Ghana's agricultural sector, particularly in food crops 	<ul style="list-style-type: none"> support a small scheme near Kpandu-Torkor fishing market and other resettlement villages 	<ul style="list-style-type: none"> very low lg. & sm. scale irrigated production in terms of potential 	
		farmers	<ul style="list-style-type: none"> rainfall shortage increases importance of draught area for agriculture 	<ul style="list-style-type: none"> Limited NGOs 	<ul style="list-style-type: none"> to make use of residual moisture in draught area produce food crops for subsistence 	<ul style="list-style-type: none"> household production and customary system 	<ul style="list-style-type: none"> maintain their livelihood and improve standard of living gain support for their initiatives est. cooperatives in some cases where possible 	<ul style="list-style-type: none"> sm. projects like Anpan limited benefits of pilot projects do not diffuse easily 	<ul style="list-style-type: none"> supplementary irrigation needed to utilize draught 	
		Fisheries Department		<ul style="list-style-type: none"> Japan-grant-aid to Volta Lake fishery development program (1981) 	<ul style="list-style-type: none"> increase cash incomes in accordance with Ghana's development policies, to expand fishing sector 	<ul style="list-style-type: none"> acquire responsibilities by VLR & DP & VRA assist Volta fishermen 	<ul style="list-style-type: none"> assistance to fishermen increase catch and marketing 	<ul style="list-style-type: none"> strategic management of existing scheme at Kpandu-Torkor 	<ul style="list-style-type: none"> transition of projects to Fisheries Dept. is unstable lack of manpower, access to donors, some support from VORADEP 	
		fishermen			<ul style="list-style-type: none"> depend on fishing for a livelihood, including selling and marketing 	<ul style="list-style-type: none"> occupy lakeshore area to exploit fishing 	<ul style="list-style-type: none"> food supply economic gain 	<ul style="list-style-type: none"> migration to Volta Lake made use of own resources 	<ul style="list-style-type: none"> increases in fish stock stimulates increase in number of fishermen, catch, and marketing 	
		resettlement process	Primarily the overall responsibility of VRA but shared and managed by other gov't institutions		<ul style="list-style-type: none"> ANTRUD: UN World Road Programme Soviet Union KFQC: Canada (ACRES) Saudi Arabia Russett Bales 	<ul style="list-style-type: none"> provide residents in areas to be inundated with construction of the Akosombo and Kpong dams with housing, townsites modernize their way of life - introducing mechanized agriculture 	<ul style="list-style-type: none"> to evacuate population to make possible the creation of Volta Lake and construction of Kpong Dam 	<ul style="list-style-type: none"> for VRA to provide land, housing townships, farming 	<ul style="list-style-type: none"> resettlement housing & town failure in intensive mechanized rainfed agriculture stimulates some departure of the resettled pop. 	<ul style="list-style-type: none"> Akosombo-resettlement still treated as problematic enclave Kpong-resettlement loses crisis identity better integrated to surrounding region
		Volta Lake Research and Development	9 Ghanaian Gov't and University participating units and Inter. experts			<ul style="list-style-type: none"> UNP WD BO 	<ul style="list-style-type: none"> investigate the social and ecological impacts of the dam construction and lake creation 	<ul style="list-style-type: none"> monitor changes in lake ecology, public health set up demonstration farms and pilot projects to promote development of agriculture irrigation and fisheries hand over responsibilities upon termination of UN funding 	<ul style="list-style-type: none"> extension of research knowledge to implementation of effective programs 	<ul style="list-style-type: none"> creation of pilot projects, program in fishing, and irrigation facilities at Kpandu-Torkor ending of international support seems to limit ability of Ghanaian participants to continue

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Table 5 continued

PHASE	OFFICIAL PLANS	INSTITUTIONS	UNPLANNED EVENTS	SIGNIFICANT IDEAS	GOALS	FUNCTIONS	CRITERIA FOR SUCCESS	OUTPUT OR OUTPUT	RESPONSE TO OUTPUT
Contemporary 1980's		Other institutions beyond the VRA 5 Examples							
		1.) Regional Gov't - Admin. Ex. of Volta Region			<ul style="list-style-type: none"> unclear under Ghana's current revolutionary gov't. Intended to decentralize or regionalize central gov't. and decision making 	<ul style="list-style-type: none"> potentially to perform coordinate regional level budget/planning process 	<ul style="list-style-type: none"> perhaps at this stage the amount of responsibility this institution undertakes which is currently implemented by central gov't 	<ul style="list-style-type: none"> partial consolidation of central gov't. functions into a regional office 	<ul style="list-style-type: none"> appears to be more of an experiment unsure as to future Does not treat the Volta Basin separately or differently from the Volta Administrative Region
		2.) Volta Region Agricultural and Dev. Project - VORADP		World Bank FAO African Develop. Bank	<ul style="list-style-type: none"> emerge (short term) agricultural 5yr. development in the region by direct funding consolidate agriculture departments in one management/planning structure at regional level 	<ul style="list-style-type: none"> appropriate and manage funding for reg. agric. projects create agric. planning framework coordinate sectoral programs for agric. 	<ul style="list-style-type: none"> establish efficiency in budgeting planning and implementing projects insure completion of 'seed' projects by injecting adequate funding 	<ul style="list-style-type: none"> development of basic projects in: crop varieties; extension and construction, water supply experience of multi-sectoral team approach for agricultural development 	<ul style="list-style-type: none"> whether impulse of direct funding at regional level provides base to expand on later is unclear question of future institutionally after VORADP funding and expatriate staff is removed perhaps because of short term served to create dependency on external resources no official linkage with VRA or Volta River Development and no recognition of needs and potential of developing Volta Lake micro-region
		3.) NDO's example of Catholic Relief Services (CRS)		U.S. NDO	<ul style="list-style-type: none"> traditionally more relief oriented food aid etc. secondary interest in developing local small-scale projects 	<ul style="list-style-type: none"> respond to requests for funding small-scale projects provide minimal technical assist. carry out relief food aid programs 	<ul style="list-style-type: none"> create some level of local self-sufficiency provide experience for self-help maintain adequate food production/supply 	<ul style="list-style-type: none"> successful match-up of resettlement village irrigation project, right funds at right time, coupled with local management ability 	<ul style="list-style-type: none"> the intermediary action of local parish priest was a key in reviving a VURP pilot project in draught agric. how do you repeat the process promote coordinated efforts between VRA and NDO's?
		4.) Resettlement township associations			<ul style="list-style-type: none"> traditional outgrowth of resettlement crisis and response of community action committees along ethnic lines 	<ul style="list-style-type: none"> expression of traditional leadership advocate interests of local groups, community chiefdoms petition or request action from appropriate gov't. office develop community sense of collective action, self help 	<ul style="list-style-type: none"> eliciting response from higher authority usually directed to VRA resolve conflict from community viewpoint maintain community leadership roles 	<ul style="list-style-type: none"> mixed results to resolving conflicts establish legitimacy and necessity from community interests through recognition of gov't agencies which now is anticipated at the beginning of planning process 	<ul style="list-style-type: none"> such forms of community action particularly petition format is more a legacy of the past resettlement crisis what is the role of association beyond advocacy issues?
		5.) Small scale rice farmers (largely unorganized more spontaneous in nature)			<ul style="list-style-type: none"> take advantage of small-scale cash earning opportunity diversify production utilize access to new water resources 	<ul style="list-style-type: none"> cultivate cash crop for local market cash farming with least amount of inputs from outside household and village 	<ul style="list-style-type: none"> rice field marketing ability coupled with cash reward amount available to invest in rice cultivation 	<ul style="list-style-type: none"> increasing number of farmers practicing irrigated rice farming significant cash rewards still available resources for rice plots-but this will eventually run out 	<ul style="list-style-type: none"> spontaneous diffusion effect among farmers themselves observed by local CEC institutions but no interference or support How long will it last without formal institutional support?

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influence but it exists as an independent state institution. Having the power to negotiate with foreign donors, without needing government sanction, gives it a dominant position. It operates outside the civil service, is fiscally independent, and is almost a government within a government. With such power, it is clearly the major force for development in the river basin. Consequently, its mandates, goals, operations, and organization are all central to the understanding of the history of the Volta river basin and its future potential.

The Volta river project was conceived before Ghana became independent from Britain in 1957, but it was not realized until 1961, when a start was made with international financing. The project was seen as the key to Ghana's economic development through an industrialization policy based on hydropower. It was also seen as a way for Ghana to achieve regional hegemony in West Africa through the sale of electricity to neighboring states. This was the dream of President Kwame Nkrumah, the first president of Ghana. It was a highly prestigious project for the new state and the Volta River Authority continues to have an international reputation as an effective river basin institution.

The Volta River Authority

Although the language used in the enabling act and in the earlier reports of the Preparatory Commission speaks of multi-objective planning, the stated purpose of the Volta River Authority was mainly to develop hydropower in the most cost-efficient way through the construction of dams. Private management techniques, based on the criterion of profitability, are used and it does not operate as a basinwide development agency despite the many ancillary activities that it has undertaken. No comprehensive, basinwide development programs were budgeted for and no master plan has been prepared. This was not an original goal of the project when it started in 1961 and such an approach has not been a

major concern of the Ghana government to date. Its primary mission has been, and is still to supply the country and its neighbors with hydroelectric power and in this it has succeeded. It is a strong and well-managed institution.

Not all of the original objectives of the project have yet been achieved. It was intended that local supplies of bauxite would be used in the production of aluminum but imported ores proved cheaper. There has also been a change in focus to supplying Ghana's domestic needs while continuing the expansion of delivery to other West African countries with some curtailment of supplies to the aluminum smelter. This change was underscored during the drawdown in water supplies associated with the recent Sahelian drought when domestic interests were made paramount and VALCO's rate of consumption fell after 1982. VALCO stands for Volta Aluminum Company. Fluctuations in storage capacity due to the drought also strengthened the bias against irrigation which was seen as competing for water supplies and, therefore, as a constraint to the primary goal of the project to produce hydroelectricity. The Volta River Authority, therefore, remains very close to its first mandate and nonpower activities have been undertaken only as an adjunct to hydropower production.

This is the institutional framework within which development of the Volta river basin in Ghana has taken place. It is widely thought that while the Volta river project has been of immense benefit to Ghana as it has evolved, the full potential of the river basin has yet to be realized (Quartey 1987). The question now is how can broader objectives be achieved in the Volta river basin in Ghana, and what institutional arrangements can best facilitate these?

Institutional Issues in the Volta River Basin

Although the Volta River Authority has been reluctant to undertake non-power activities, it has been forced to do this in some cases for lack of any

other institution capable of carrying these out. Often these activities were undertaken with the understanding that they would eventually be transferred to line ministries of the government. As it is, these ministries do not have either the manpower nor the financial capacity to manage them.

From the start of the project, the Authority accepted responsibility for health problems and resettlement issues. It was clearly envisaged that there would be some health problems connected with the creation of such a large lake (3,275 sq mi). Programs were instituted with the assistance of the government and international institutions such as WHO and UNDP. Resources for all nonpower activities are coordinated by the Authority's chief medical officer, reflecting this initial concept that they represented special duties (Table 3; Perritt, 1987).

Other than this, resettlement was not even planned as an integral part of the project. When the Authority was called upon to accept part of the responsibility for resettlement, it became a hurried evacuation of people threatened by the dam at Akosombo, not a well-thought-out development project. In a later phase of the project at Kpong, this mistake was rectified and resettlement was incorporated into the planning process from the beginning. Broader objectives continued to take second place to power production and no comprehensive regional plans were considered.

Irrigation has never been accepted as an integral part of the Volta river basin project. No outlets were built into the original dam at Akosombo and, although this policy was changed when the dam was built at Kpong, the irrigation taking place there is under the control of a private company, a subsidiary of the Volta River Authority. Funding for some agricultural activities also comes from the government in cooperation with the Authority. In addition, there are non-government organizations (NGOs), such as Catholic Relief

Services, working with local farmers on projects based on lakeside irrigation and floodplain cultivation. It is clear that there would have been greater benefits in river basin development here had irrigation been planned at the start (Quartey, 1987).

Among the other functions performed by the Authority as ancillary activities are lake fisheries, lake transport, lake monitoring and research, and the management of Akosombo township. Fisheries have been managed in association with government agencies and have been highly successful for lakeside dwellers. Lake transport has been helped managerially and technically by grants from West German donors in recent years. It is managed by a subsidiary company of the Volta River Authority known as the Volta Lake Transport Company and is expected to be self-supporting and to make profits. This is the management model for nonpower activities that the Volta River Authority prefers. There is great potential for the further development of lake transport, particularly in connecting the northern and southern parts of the country since the distances are shorter than by road and roads are frequently impassable during the rainy season. Local ferrying services are undertaken by private operators and contribute to local economic development by linking lakeside markets.

There is inadequate provision for lake monitoring and research, mainly due to lack of financial resources since there are institutions capable of carrying out these functions. The University of Ghana, the Institute of Aquatic Biology, and the Fisheries Department of the Ministry of Agriculture all have an interest in lake monitoring. UNDP has suggested a common program to coordinate lake research but funds have not been forthcoming. Data are presently collected on an individual project by project basis. The Volta Lake Research and Development project did carry out a range of research and monitoring activities

funded by UNDP until 1977 but with the termination of funding at a period of economic difficulty for Ghana, activities were steadily curtailed. By 1988, most of these initiatives had either been formally given to other agencies or terminated. Given continued resource constraints, it is not clear what priority the Ministry of Fisheries, for example, can give to lake monitoring.

Akosombo township has been provided with street lighting, a sewage system, pipe-borne water supplies, and other amenities such as hospitals and schools, as well as a privately owned textile factory. Resettlement villages also have superior services and are regarded as government showplaces. Management by the Volta River Authority was always considered to be temporary and it was expected that eventually they would be integrated into a regional system but this has not happened except for education. The idea was that the appropriate line ministries would take over.

There are obviously institutional gaps in the management of the Volta river basin. Despite its primary purpose as a supplier of hydropower, the dominance of the Volta River Authority in nonpower activities is also apparent and, therefore, it is important to understand how and why the Authority continues to manage such extra functions. Institutionally, these have been managed either through cooperation with government agencies, through subsidiary profit making companies, or directly by the Authority. The Authority has worked well in cooperation with the government but has retained a large measure of autonomy (Quartey 1987). It is also well-staffed by Ghanaian personnel and does not rely on expatriates. The main issue is whether the authority can continue to carry such broad responsibilities or whether new institutions should be set up for multi-purpose development. Government presently lacks sufficient funds and personnel to take over the organization of activities that the Authority would like to hand over. Neither has comprehensive regional

planning been undertaken in Ghana, into which river basin planning might be accommodated, because the administration is highly centralized. The result is that activities are uncoordinated, often inadequately financed and managed, and seldom geared to local economic advancement.

The Need for Integrated River Basin Planning in the Volta Basin

In the last two decades, there has been increased attention among development agencies to the idea of comprehensive river basin planning and increased local participation. It is clear that the full potential of river basin development is not achieved through single purpose hydropower projects. The development of all the resources of the basin, land, and people, as well as water and multiple uses for water in addition to power generation, is necessary if greater benefits are to be realized. Regional interests would then also be given more weight. For this to happen, there will need to be further analysis of the management systems and reassessment of planning goals by both government and donors.

More integrated planning is called for to increase the benefits from the creation of new water resources but it is also essential to protect the interests of those affected by such drastic changes in the ecology of the area. In some cases, people can and do respond to new challenges spontaneously, such as fishing and agricultural opportunities provided by the lake, but there are other spheres, resettlement, public health, irrigation, transport, and marketing, where larger facilitating institutions are needed. Many of these activities have been undertaken either in a crisis pattern of management or on a project-by-project basis without substantial coordination.

The formulation of regional objectives and the strengthening of regional authorities could do much to overcome these problems. As it is, regional authorities are seldom involved with project activities within their areas.

Research institutions operate from a national, not a regional, base and the strong centralized authority of the Volta River Authority reinforces this situation. In the case of the Ghanaian government, a similar approach is maintained and regional level planning is minimal. VORADEP, the Volta Region Agricultural and Development Project is an example of a non-VRA authority whose work could significantly complement Authority actions. A strong regional administration has been supported by World Bank funding and technical assistance in a five to ten year project to improve agricultural production in the region. While these initiatives are still underway and show promise, it is unfortunate that so far there seems to have been little institutional linkage between VORADEP and the VRA. Indeed, it seems possible that VORADEP has been reluctant to develop projects on the lake shores because of possible conflict with the VRA.

To describe these issues is not to lay blame on either the Authority or the government. In the case of the Authority, it is not feasible for one institution to carry out so many different activities or even to oversee and coordinate them all basinwide. In the case of the government, there are many problems such as the lack of manpower and funds, common to many developing countries.

The ability of the government to establish regional management authorities of the scope needed is limited and support would be needed to strengthen any such institutional development. An interim step would be the establishment of some intermediate institutions to coordinate existing agricultural projects in the lakeside areas, to coordinate institutional involvement in lake monitoring and research, and to provide better marketing systems to spur development generally.

To sum up, the major institutional issues in the management of the Volta

river basin within Ghana are those associated with the lack of intermediate or linking institutions between the highly centralized Volta River Authority and the local or regional authorities, the institutional gaps and shortage of capacity within government due to lack of funds or personnel, and the weak development of regional administrative institutions associated with this. At present, the Volta River Authority operates as the major institution responsible for economic development within the Volta river basin in Ghana, dominating all activities but without the institutional capacity to be a coordinating agency.

Major Findings from an Institutional Analysis of the Pangani Basin in Tanzania

Unlike most examples of river basin development in Africa, the Pangani river basin has never been under the control of a special river basin authority, although the idea has been raised several times over the past thirty years.

As noted earlier, the Pangani gained early attention from the colonial government because of its potential for easy development of hydropower. At that time, in the early 1930s, no competition from planned irrigation was foreseen in the lower Pangani, but TANESCO, the national power company, was given legislative authority and acquired preferential rights for electric power generation and supply in the valley.

The existence of the Tanganyika Packers Irrigation (TPC) scheme in the upper-middle river valley was not considered a handicap to these arrangements as it used mostly ground water, and the upper-middle course was separated from the hydroelectric power sites by flat swampy areas where much water was lost anyway.

TABLE 6

AFRICAN RIVER BASIN DEVELOPMENT: INSTITUTIONAL ANALYSIS: (Large Scale) PANAGANI/T

Time Sequence	Institutions	Mandates/ Goals	Actions Organizational	Actions Operational	Problems Arising	Unanticipated Events	Linking Institutions*
Pre- Independ.	Brit. Colonial Gov. TPC TANESCO Halcrow Engineers	Provide 50% sugar needs Hydropower for Dar es Salaam		6,000 ac. planted Pangani Falls Power Sta. 1932 Engineering Surveys 1950			
1961 - 1964	Tanganyika Inde. Gov. TPC TANESCO FAO	Provide 50% sugar needs Hydropower/Irri.	Planning Teams	Reports Publ.			
1964 - 1972	Tanzania Government TPC TANESCO FAO Regional Dev. Comm. WD-ID PADECO	Provide 50% sugar needs Hydropower/Irri. Planning Irrigation Coordinated Reg. Devopment Planning Irrigation District Developmt.		Hale Power Sta. (1964) Nyumba Ya Mungo Dam (1965)			54
1973 - 1981	Tanzanian Government TANESCO Regional Dev. Comm. Water Board PADECO NAFCO(+TPC+Kahe Est.)	Provide 50% sugar needs Electric Power Gen. National Grid Coor. Water Use District Developmt. National Food Prod.				PADECO disbanded WD-Hydrological interest only TPC taken over by NAFCO	

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Table 6 continued

Time Sequence	Institutions	Mandates/ Goals	Actions Organizational	Actions Operational	Problems Arising	Unplanned Events	Linking Institutions*
Post 1981	Tananian Government TANESCO Regional Dev. Comm. Water Board NAFCO Japanese Donors	Provide 50% sugar needs Electric Power Gen. Coor. Water Use National Food Prod. Food Security/ Reduce Imports			Rice Proj.	Water shortage - drought	

*Linking institutions can include those without local offices but with functional roles.

Table 6 continued

Time Sequence	Institutions	Mandates/ Goals	Actions Organizational	Actions Operational	Problems Arising	Unplanned Events	Linking Institutions*
Post 1981	Households TANESCO Water Board WD-ID NAFCO NCCO Japanese Aid Donors	Rehabilitation of Power Facilities National Food Production	Rice Production Food Security - Reduce Imports	Rice Project	Japanese ignore water rights Kahe likely to fold		District - Regional office National Milling Co. Tanu

Institutions are any significant bodies that make decisions and take actions (i.e., households, irrigation authorities). Local institutions include Local in Origin plus local representatives of larger institutions (e.g., district offices, local TANESCO officials).

Linking institutions can include those without local offices but with functional roles.

56

Table 6 continued

AFRICAN RIVER BASIN DEVELOPMENT: INSTITUTIONAL ANALYSIS: (Small Scale Local)

Time Sequence	Institutions	Mandates/ Goals	Actions Organizational	Actions Operational	Problems Arising	Unplanned Events	Linking Institutions *
Pre-dam (Before 1964)	Households (Farm) (Pastoralists) Regional/District Govt. Offices TANESCO	Risk aversion Food Security					District-Regional Offices Tanu
1932	Pangan Falls Power Station (no dam)			Pangan Falls Power Station			
1964-72	Households TPC Sugar Estate/ Kahe Project/ TANESCO	Food Security Commercial Hydro Power Welfare	Govt. Fisheries AG 1970	Kale Power Str 1964 Nyumba Ya Mungo Dam 1965		Fishermen from Lake Areas come In - 26 villages Formed (25,000pp) Fish Processing	District-Regional Offices Tanu Mobile Health Units
1970	Water Board	Resolution of Water		Dispensaries Schools		Marketing Introd. Private Enterprize	Transport Companys Fish to Hoshi
1970 1972	WD - ID PADECO	Dev. of Irrign. Fish Marketing					
1973-81	Households TANESCO Water Board WD - ID PADECCO	Food Security Fishing Profits				Villages Abandoned	Districts-Regional Offices Tanu
1975	NAFCO (Inc. TPC - Kahe Estates) NCCO UJAMA				Salinity Problems at Kahe Fishing declines		

The institutional arrangement, as it evolved in the period before World War II and immediately after it, involved three types of institutions each with separate spheres of action:

- (i) TANESCO producing hydroelectricity from the lower river.
- (ii) TPC, a private company irrigating 6,000 acres in the upper-middle river.
- (iii) Indigenous water users developing furrow irrigation on the lower slopes of the Kilimanjaro and Pare mountains.

In the 1960s, TANESCO used its legislative authority in the basin to allow the creation of two new structures, the Hale Power Station in 1964 and the Nyumba ya Mungo Dam in 1965. The completion of the dam removed the danger of frequent flooding in the central plains and improved the regulating of flow to the two power stations. It also initially made available over 200,000 acre feet of water for irrigation upstream of the Hale Power Station.

By the 1960s and early 1970s, the institutional situation had become more complicated, but still without major conflicts. It could be summarized as follows:

- (i) TANESCO producing hydroelectricity from two sites in the lower river.
- (ii) TPC and a new project, Kahe, using large-scale irrigation in the upper-middle basin (total 10,000 acres).
- (iii) Traditional water user associations now incorporated at least in part into the Ujamma village hierarchy and beginning to use water from main tributaries and the main river.
- (iv) Stronger regional and district authorities exercising control over many small-scale water issues.

- (v) Growing numbers of marketing and other parastatals reporting directly to central government.

The institutional situation in the 1980s is certainly more complicated than at any time in the past. Five main factors have led to this increased level of complication: (1) the establishment of the Lower Moshi project with Japanese assistance, (2) the drive for irrigated agriculture in the middle and lower Pangani; (3) the role of the national marketing boards; (4) the substantial increase in population; and (5) the lack of clarity in the role of national versus regional decision making.

By the 1980s, the need for mediating institutions had become very apparent. The situation would have been more acute had it not been for the decreased importance of hydropower in Pangani in relation to the national supply. In many cases, the regional institutions in Arusha have played an important role, but they do not have the authority to deal with the whole basin. It may be that a zoned authority involving the various regional administrations of the basin may be appropriate in this area.

In summary, the Pangani basin has survived and even managed quite well up to this decade without a centralized authority for river basin development. However, the pressure on resources has now reached the point where new mediatory and planning institutions or arrangements are likely to be needed. If it is possible, these should be built on the firm foundation of the regional authorities in this area.

A SUMMARY OF THE MAJOR INSTITUTIONAL ISSUES
IN AFRICAN RIVER BASIN DEVELOPMENT

The major institutional issues in African river basin development are concerned with the question of natural resource management. Many of the problems arise from mismanagement and resulting underutilization of the land and water resources of the basin. African river basins are important, even crucial, resources for the developing nations of the continent faced with serious problems of low agricultural production and food shortages. Therefore, these issues are critical and improving the ways in which river basins are managed could have significant economic effects. In general, the great potential of the river basins of Africa has not yet been realized. A summary of the experience from the four basins surveyed in this report should help to highlight the major reasons why this is so.

The existence of a river basin as a basic hydrological unit and physical system is the basis for looking at management problems in terms of the whole basin. This is also the logic for the establishment of central river basin authorities but in practice these authorities have not fulfilled the roles of comprehensive basinwide planners. Instead, they have been focused on the single purpose management of water resources for hydroelectric power production. All other activities have been seen as secondary.

The management of river basins is not a simple undertaking and there are many reasons why river basin authorities have not been able to function as multi-purpose managers nor to effectively coordinate resource management where other institutions are also involved.

A river basin is a very complex system and its management poses some very difficult problems. Size alone can be an issue, necessitating sophisticated organizational systems that are often beyond the institutional capacity of a

poor developing country. In some cases, international issues arise where a basin is shared by several different countries, as is the case for the Nile Basin or for the Volta Basin, studied in this report. Special circumstances once made possible overall development plans for these two river basins in that each was first developed under the broad auspices of a colonial government that had both the power and the resources to operate on such a large scale. Today, such power is fragmented and so is the ability to attract funds and manpower for development. The management of large river basins thus presents a different set of problems in the post-colonial age.

Each river basin has a specific set of problems relating to the physical properties of the basin, the degree of development that has taken place, and the historical evolution of its management systems. Although all river basins are hydrological entities within which activities in different segments of the basin have effects upon the whole, there are differences in the ways in which these effects occur based on the geological structure and river regime. Also important is the degree to which the river regime has been altered by dam construction, bringing drastic changes within a short time period. New demands for water change the customary institutional arrangements for water apportionment. New authorities may override existing local laws. New laws may replace older arrangements for water sharing, first come, first serve, on a time basis, for example, as against riparian rights on an equity basis. Physical factors and human factors are interrelated in the management of river basins and both are subject to change. The evolution of the various management systems operating in a particular basin and how they fit together, or, alternatively, act independently or work against each other, is of critical importance in understanding management problems or issues. Often the lack of integration, which is noted in this report as being a fundamental issue, has its source in histor-

ical circumstance and a step-by-step development of institutions competing with one another in the absence of an overall development plan for the river basin.

There are many different scenarios and many different outcomes. Even though most river basins have a river basin authority, these do not operate in the same way. They do not all have the same mandates, roles, responsibilities or capabilities. The relationship of the authority to the national government may be very different in one basin from another. Links with regional and local institutions may be different, or with other national institutions. It is the purpose of an institutional analysis to uncover these different patterns and systems of management, to see what works and what does not work, and which systems are most effective. There is clearly a common need for better coordination of activities within river basins, for more effective sharing of information to avoid conflicts in resource management, and to improve the use of these resources by rethinking the institutional framework within which river basin development takes place.

Three of the basins studied have river basin authorities and their roles and function have been examined. The Pangani river basin in Tanzania does not have a river basin authority, providing an alternative form of development.

The issues of coordination and linkage are highlighted in this report as being the most crucial. A river basin authority cannot take responsibility for all that takes place within its territorial purview. In practice, devolution of some responsibilities, coordination of activities, sharing of data regarding these and the consequential effects of them within the basin, are important parts of a good management strategy. The following pages will detail the main issues and problems.

The issue of the role of the single purpose authority. It is interesting to note that a single purpose agency can exist even where the original mandate

was written in multi-objective terms. This can be verified by the study of the Volta River Basin Authority and the Tana and Athi River Basin Development Authority.

The main activities in any river basin are (potentially) hydropower production, irrigation, fishing, and navigation. These all involve water use and issues of water apportionment. The inaugurating document may make reference to all of these but where a large dam has been constructed, involving high capital expenditure, often by foreign investors and donors, the prime purpose has generally been to produce hydropower. This is the activity which generates the greatest benefits in financial returns to investment and so other activities are often referred to as "secondary," "ancillary," or "nonpower," activities.

There is no question that the centralized authority is the most efficient for the purposes of hydropower production. Examples from these studies are the Volta River Authority in Ghana and the Tana and Athi Development Authority in Kenya.

The Volta River Authority is strong and well-managed and it is the single most important institution in Ghana. It has been referred to as "a government within a government" and it has the authority to negotiate independently with foreign governments for loans and funds. It dominates the development of the river basin. In producing hydropower, it is highly successful. It operates on sound commercial lines and its financial and managerial resources are concentrated on the power function (See Table 3, Perritt 1987). The costs of nonpower activities, including those consequent upon dam construction such as health and resettlement, were treated as indirect costs. They were not expected to generate economic returns nor were they intended to be paid for from the sale of power (Perritt 30). Nonpower activities were considered to be beyond the scope of the Volta River Authority but accepted unwillingly as a

responsibility when forced by government. The Volta River Authority has been criticized for its highly focused, limited, centralized role in river basin development. It may be, however, that this is the appropriate model for the efficient production of power and that other institutions should be developed or existing ones used to further the broader objectives.

The broader objectives involve dealing with the socioeconomic effects of the radical changes in the hydrology and ecology of the basin, as well as making better use of the new resources opened up for development through the provision of water and the creation of lakes. Resettlement, health, township services, fishery development, lake transport, and agriculture based on irrigation all come under this heading.

In the case of the Volta River Basin, the river basin authority has been forced to deal with many of these activities for lack of other institutional capacity, either national or local, to take over. The authority regards much of this involvement as temporary and, where possible, intends to turn over these activities to government line ministries or to create commercially viable companies to continue with such things as irrigation and lake transport. The details on these matters are set out in the case study report and in the section of this report that presents a summary of the findings.

The situation in Kenya is somewhat different in that the river basin authority, TARDA, has a less dominant role within the basin. The emphasis on hydropower, however, is virtually the same. Despite much debate about multi-objective development, the original plan focused directly on hydropower and a huge 90 percent of the budget still goes to this sector. In Kenya, the difference lies in the existence of other capable institutions; capable if not wholly successful.

Large-scale irrigation schemes, such as the Mwea scheme, were already in

existence before TARDA was set up. In addition, national ministries, such as the Ministry of Agriculture or the Ministry of Water Development, and bodies, such as the National Irrigation Board, have significant roles in basin development. The presence of international agencies and foreign donors also makes a difference. The result of the existence of so many different actors is to create other problems. Most of these institutions operate independently, preventing coordination of projects and in some cases leading to conflict. In the Tana River Basin, nonpower activities take place in a piecemeal fashion, many projects under many different auspices, including some undertaken by TARDA itself in cooperation with foreign interests which lessen the authority's role as a potential overall management authority. Neither TARDA nor the VRA act as comprehensive basinwide planning agencies.

The lack of coordination in river basin development. The absence of coordination is evident in all the river basins studies and has been identified as a major problem in African river basins generally. The seriousness of the problem depends on the present scale of operations and, to some extent, on the nature of the river basin. Where activities are relatively limited and the competition for water is consequently less acute, as is the case in the Lake Victoria Basin in Kenya, the problems are currently fewer but coordination is still important for future planning. Similarly, in the case of the Pangani Basin in Tanzania, the nature of the hydrological unit means that activities in the upper, middle, and lower sections of the river can be managed without major conflict because the existence of a natural swampy area in the middle course effectively regulates the flow of the river. The creation of the dam and power station in 1964-65 did not alter this situation significantly since more water was made available for irrigation and the flow improved while the scale of the power operations did not cut out other activities. Pressure on local resources

of land and water is now increasing due to population increases and increasing project activities. This has led to some conflicts over water rights, especially in projects undertaken by foreign donors, such as the Japanese whose understanding of the local situation, local laws, and customs of water apportionment is limited.

Hydropower has not had the same dominating importance, either in the Pangani basin in Tanzania nor in the Lake Victoria basin region of Kenya. The conflict between power and nonpower activities is, therefore, less urgent. Nevertheless, coordination of all activities remains an important issue for effective resource management here as in the other basins. Too often the initiation of new projects takes place without consideration of their impacts and without consideration of other existing projects.

For the Pangani basin in Tanzania, the idea of a river basin authority has been raised many times over the past 30 years, but the basin has not, so far, been under such a control. Thus, it has had a different institutional history from the other basins studied. The recognized failure of existing river basin authorities to act as coordinators and overall managers should be taken into account in any reconsideration of this idea. A better model might be the creation of a special zonal authority under the aegis of the regional administration. The basin comes under several of the existing regional authorities so that a special unit would need to be created to deal with the basin as a whole. Regional administrations offer a firmer foundation for overall management and planning, provided that their funds and staffing capabilities can be assured or enhanced, than the highly centralized, single purpose, organizations that are typical of present day river basin management in Africa. They can provide links to national government through an established system while at the same time they can be more responsive to local needs because they have a local

presence in the regions.

River basin authorities such as TARDA and the VRA do not have regional or local offices. Nor are they well coordinated with the respective ministries of government, except in a few special cases (See Little, 1987). They are altogether too separate, too detached from the regions of the country, too focused on the single activity of power production. Activities can be undertaken by national line ministries within the basin without their knowledge or cooperation, while similarly they can carry out works and projects independently of government sanction. This represents failure in institutional management of major resources.

In the case of TARDA and the VRA, because of the larger scale of power activities and the greater likelihood of conflict in resource use, the need for coordination is even more pressing. Environmental changes, displaced local populations and disrupted livelihood systems accompany the construction of big dams. In addition, other profitable developments are ignored for lack of planning and the study of possible complementary investments, or are relegated to second place.

While large dams entail fundamental changes that inevitably alter the path of development, it is not necessary to see them as hostile to all other activities or incompatible with these. The reason that this has often seemed to be the case in the past has more to do with poor institutional management than with the realities of the physical situation.

Better management for coordinated planning, both spatially and in the timing of operations, could lessen the negative impacts of dam construction at the start. Likewise, in terms of the regular management of power production, controlled flooding and timing of operations can protect downstream users of water. The full potential of Africa's river basins will not begin to be real-

ized until the relations of power and nonpower activities are investigated properly in terms of their water and land requirements, and better institutional systems put in place to manage this. Historically, water resources have been managed independently of land (and people) because they have come under different institutional bodies with different agendas. River basin authorities are water resource managers and they may not be the appropriate institutions to manage river basin development in the broadest sense as opposed to water resource development. New strategies might prove better than attempts to restructure these river basin authorities.

Lack of coordination in river basin planning has other critical aspects in addition to those outlined above. Besides the lack of coordination among the national institutions, including the river basin authorities as parastatals, there exists a significant lack of coordination among national, regional, and local institutions. This is true for the hierarchical, tiered, structure of the administration but it also involves other operating actors and institutions at these different levels. Again, this varies from basin to basin but it is a common problem for many.

The Tana and Athi River Development Authority for instance, in Kenya, has no relationship with the local district development committees and ignores the NGOs (Non-Government Organizations) operating within the basin of the Tana river. It does not deal with the provincial administration on a regular basis. Even when TARDA projects are likely to have large-scale effects in a district or province, local authorities are neither informed nor consulted.

In Ghana, regional and local organizations are weak in relation to the VRA and regional authorities are seldom involved with the activities underway in their areas of jurisdiction. The strong centralized authority of the VRA and highly centralized power of the Ghana government inhibits regional planning and

the articulation of regional, as opposed to national, objectives.

The Lake Victoria Basin Authority in Kenya takes the same highly centralized approach to management, even though it does not have the same power in Kenya as does TARDA or the VRA in Ghana. Its objectives are different since the main focus is on irrigation rather than power production, but it is equally indifferent to local concerns. The fact that it is also weak as an institution compounds the problem and leads to project failures.

In the Pangani basin in Tanzania, the situation is different in that until recently regional and local authorities were involved with projects in their areas. Since the 1980s, however, there has been more involvement by the national government ministries and agencies and by foreign donors, especially the Japanese, which has led to conflict between local and national interests. It has also caused inconsistent decision making by local and national authorities.

The failure to engage regional and local authorities, including those outside government such as local cooperative associations, water user groups, and other grass roots organizations, together with the overriding of local interests, is a major factor in project failure in African river basins. It is also a failure in terms of the overall management of the river basins in that national institutions without regional offices or regional bases of interests tend to be linked primarily to other national institutions while failing to generate the necessary vertical structures of management that could promote better resource management.

Another problem in river basin management in Africa is related to foreign interests, including foreign donors, that operate without any form of cooperation, either among themselves or with the governments concerned. There is little, if any, liaison

among these institutional actors who undertake specific projects in geographic areas to fit their own agendas and aid agendas rather than working with the national government to produce either regional or national plans. Like private investors, the aid agencies pursue their own narrow interests and compete for resources. Competition between Japanese and Dutch donors, key institutions in the development of the lower Tana basin in Kenya, is a case in point. Details are provided in Little (1987).

This carving up of territory for the assignment of spheres of interest for foreign donors is detrimental to the economic development of African river basins, especially since it involves a loss of national control over what is being planned.

A serious issue arising from the situation in respect to lack of coordination is the fact that data and information relevant to the hydrology and ecology of the river basins are also acquired and stored independently.

Matters of importance concerning the effects of development activities are neither shared nor made public. For example, in Kenya, the Ministry of Environment and Natural Resources is not able to commission impact studies for the TARDA schemes at the Masinga and Kiambere dam sites. Instead, TARDA carries out its own studies which are then considered to be its property. Information on hydrology and soils is collected for the individual projects but not made available to government ministries. Overseas consultants may be engaged on a project by project basis.

A similar problem exists at the regional level in the river basins where data are sent by representatives of national line ministries, such as those dealing with water and power, to national headquarters, but are not available where they are needed, on site. This is the case in Tanzania, for example, where data on the Pangani basin can be found only in Dar es Salaam, the capi-

tal, and not in the regional offices. Donors funding several projects have been known to keep data separately for each project, while it is hard for government to get access to any of the reports.

The lack of master planning has hindered integrated basin development (Little, 1987:59). The Tana Authority was established with a broader mandate than the development of the basin's hydropower potential. It was charged with the development of the region's water, land, and human resources and was assigned the task of coordinating and planning for this. The agency has never produced a master plan for the basin. Its current ten year planning document is little more than a list of proposed projects. Learning from this experience, the newer river basin authorities in Kenya are said to have recognized the problem and the Lake Basin Authority has made the creation of a master plan one of its first priorities and is in the process of producing one with Japanese assistance. No effective master plans exist for the other basins studied.

A master plan for the integrated development of a river basin would seem to be an important prerequisite for such a comprehensive undertaking but events often get ahead of the planners. Planning on this scale is also expensive in terms of funds and personnel, often scarce in developing countries. Thus, it is often foreign donors or hired consulting firms who draw up the plans. This reliance on foreign expertise, which is a factor in all economic development issues in the countries of Africa, adds further problems to the planning exercise. The value of the concept of multi-objective planning and comprehensive management is frequently acknowledged but it is seldom applied because it is often not feasible because of the weakness of the institutions needed to implement it.

The main picture that arises is one of competing interests, separate and discrete activities, and a lack of any integrated planning. A master plan is

difficult to produce in these circumstances and takes a long time. Meanwhile, activities continue and development does not wait upon the planners. In this case, the real issue is how to coordinate activities; how to monitor and evaluate the outcome, and assess the physical effects upon the river basin; how to collect information on the physical changes in the river, its banks, and catchment areas; how to collect data from the various projects underway; and also, very importantly, how to make this information available to those who need to use it.

Conclusion

The institutional analysis of these four river basins in Africa leads to the conclusion that a number of management models are possible. The concept of a single river basin authority wielding power over all development activities within a river basin may not be the most practical. While the building of large dams calls for institutional arrangements of a different order from those needed for the management of river basins that have been less drastically altered, the basic need for coordination of activities is the same. It is obvious that the single purpose authority works very well where large-scale construction and changes in a river's regime for the production of hydropower is planned but that inattention to the effects of these changes on people, on the health environment, on local production systems, and on the future possibilities for productive activities in the basin area, is a common occurrence which can be avoided by better institutional planning. The separateness of these authorities and their independence and lack of coordination with national government is a major factor. Clarifying the goals of river basin development at national level is critical, who benefits and who loses. It is important to ensure that those who live in the basin areas have a chance to

benefit as well as those in distant urban centers receiving the new hydroelectric resources. The challenge is to find ways in which coordination can be achieved.

Nothing so far has worked very well in terms of whole basin management and African river basins are greatly underutilized in relation to their potential. Where river basin authorities exist, the history of their purposes and development, internal weaknesses in some cases, separateness in operation, and the immensity of the task of comprehensive planning when it is thrust upon them, means that they are unable to carry out all that is required for comprehensive river basin planning. Making better use of the regional authorities, creating special regional authorities where needed, and strengthening the linkages among the existing institutions of government are key elements of possible new approaches. Bringing the activities of foreign donors and other actors, such as the commercial companies into the national planning process, would also lessen the effects of uncoordinated projects and activities. Strengthening the communication between national and regional and local institutions would increase the benefits of development. Working on improving management and the coordination among managers may be more useful than working to produce master plans or blueprints for river basin development.

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