

Volume 23 Number 4 December 2007

International Journal of
**WATER
RESOURCES
DEVELOPMENT**

Chief Editor: Asit K. Biswas
Editor: Cecilia Tortajada

Third World Centre for Water Management
Mexico

 **Routledge**
Taylor & Francis Group
ISSN 0790-0627

Water Resources Development,
Vol. 23, No. 4, 691–708, December 2007

 **Routledge**
Taylor & Francis Group

Integrated Water Resources Management in the Cross River Basin, Nigeria

EMMANUEL M. AKPABIO*, NIGEL M. WATSON**,
UWEM E. ITE** & IMOH E. UKPONG*

*Department of Geography and Regional Planning, University of Uyo, Uyo, Nigeria; **Department of
Geography, Lancaster University, UK

ABSTRACT *This paper examines the implementation of Integrated Water Resources Management (IWRM) in the Cross river basin, Nigeria. The Cross River Basin Development Authority (CRBDA) was established in 1976 with a mandate for integrated development, using the abundant water resources available in the region. Thirty years after the creation of the CRBDA, there is still a large gap between the original objectives and the actual delivery of services to meet the needs of the people. A wide range of study methods, including stakeholder meetings, focus group sessions, interviews and observations at village meetings of selected communities was used to examine the implementation of IWRM against the expectations and needs of the people. The paper concludes that IWRM in the Cross river basin (CRB) has not been very successful. This is attributed to a number of institutional factors, including legal, political, administrative and financial obstacles. This paper recommends that IWRM policies in the CRB should be reformed to reflect local circumstances and conditions.*

Introduction

Integrated water resources management involves the co-coordinated development, allocations, use and management of water, and related natural resources in order to meet present and future human needs whilst maintaining the functioning of vital ecological systems (Mitchell, 1990). Thus, equitable resource allocation, efficient and balanced resource use, participation of stakeholders in decision making and recognition of linkages and interactions among human and physical systems are key principles upon which integrated water resources management is based.

The concept of Integrated Water Resources Management (IWRM) has been around for more than 80 years (Mitchell, 2004) but was rediscovered and embraced by many international institutions during the 1990s (Biswas, 2004). We can go back centuries to discover forerunners of the present IWRM paradigm. In a number of countries, integrated water management has been institutionalized and developed over centuries. In Valencia, Spain, for example, multi-stakeholder, participatory water tribunals have operated since at least the 10th century (Rahaman & Varis, 2005). Embid (2003) notes

Correspondence Address: Emmanuel Akpabio, Department of Geography and Regional Planning, University of Uyo, PO Box 4223, Uyo, Akwa Ibom State, Nigeria. Email: Emakpabio@yahoo.com

0790-0627 Print/1360-0648 Online/07/040691-18 © 2007 Taylor & Francis
DOI: 10.1080/07900620701488612

that Spain was probably one of the first countries to organize water management on the basis of river basins, as it adopted the system of confederaciones hidrograficas in 1926 (Rahaman & Varis, 2005). Over the past few decades, there have been several attempts to implement IWRM in different parts of the world. These range from the Tennessee Valley Authority (TVA) experience in the USA (Ransmeier, 1942; Lilienthals, 1944; Clapp, 1955; Kyle, 1958) to practices in England and Wales (Funnel & Hey, 1974; Okun, 1977) as well as similar experiences in France (Lamour, 1961; Harrison & Sewell, 1976) and New Zealand (Howard, 1988). In Australia, the idea of total or integrated catchments management was given attention in the mid-1980s (Sewell *et al.*, 1985; Burton, 1986; Cunningham, 1986; Australian Water Resources Council, 1988; Mitchell & Pigram, 1989).

Common to all these management attempts was the recognition of the intricate linkages between water and land as well as among economic, social and environmental systems. Consequently, it is often expected that integration will lead to cooperation and coordination, which in turn will lead to overall improved effectiveness (Mitchell, 1990; Kraenzel, 1957; Wengert, 1981; Dovers & Day, 1988; Kirby & White, 1994).

The relative success of the early coordination efforts became a catalyst for other governments to focus attention on this idea, especially in the 1970s and 1980s. Examples are found in India (Bose, 1948; Kirk, 1950; Johnson, 1979; Saha, 1979); Nigeria (Faniran, 1972; Faniran *et al.*, 1977; Olayide *et al.*, 1979; Adams, 1985); and the Philippines (Rondinelli, 1981). For instance the Cross River Basin Development Authority (CRBDA, Nigeria) (2004, p. 9) stated:

Borrowing from the American and British experience, the idea of creating water Authorities was evolved and this guided the Federal Government in the 60s in the commissioning of studies which eventually led to the establishment of the River Basin Development Authorities in Nigeria ...

At the United Nations Conference on Water held in Mar del Plata (1977), IWRM was the recommended approach to incorporate the multiple competing uses of water resources. Subsequent international conferences also embraced IWRM. These include the Dublin Conference (January 1992), the Second World Water Forum and Ministerial Conference held in The Hague (March 2000), the International Conference on Freshwater, Bonn (December 2001), the World Summit on Sustainable Development (2002) and Third World Water Forum (2003). At all these conferences, the consensus was that Integrated Water Resources Management (IWRM) was desirable and needed for effective and efficient management of water resources.

However, Biswas (2004) has questioned the practicality of IWRM as a panacea for water resources management. In his assessment of the concept, he expressed concern that what is promoted as a 'new' concept has actually existed for a long time, and argued that the concept is not operational or cannot be implemented. He rests his argument on the fact that the world is heterogeneous, with different cultures, social norms, physical attributes, a skewed availability of renewable and non-renewable resources, investment funds, management capacities and institutional arrangements. He equally noted that the systems of governance, legal frameworks, decision-making processes, and types and effectiveness of institutions often differs from one country to another in very significant ways. Accordingly, and under such diverse conditions, Biswas went on to question whether

a single paradigm of IWRM could encompass all countries, or even regions, with diverse physical, economic, social, cultural and legal conditions. Biswas (2004, p. 255) raised the following additional questions:

Can a single paradigm of IWRM be equally valid for an economic giant like the United States, technological powerhouse like Japan, and for countries with diverse conditions as Brazil, Bhutan, or Burkina Faso? Can a single concept be equally applicable for Asian values, African traditions, Japanese culture, Western civilization, Islamic customs, and emerging economies of Eastern Europe? Can any general paradigm be equally valid for monsoon and non-monsoon countries, deserts and very wet regions, and countries in tropical, sub-tropical, and temperate regions with very different climate, institutional, legal and environmental regimes?

The answer according to him most probably is likely to be 'no'. He observed that, based on evidence available, IWRM is now a somewhat amorphous concept. In his words:

it should be noted that IWRM is a means to an end: that end being rational water management for poverty alleviation, equity, liberty, democracy, ecosystems and conservation, and / or some combination of these and other appropriate objectives, which the society of a specific country or region, should determine (Biswas, 2004, p. 255)

He concluded that what is now needed is an objective, impartial and non-dogmatic assessment of the applicability of IWRM.

From the above arguments it is easy to conclude that implementing IWRM is by no means easy. Many developing countries, including Nigeria, are currently faced with several water management challenges and problems that vary according to the physical, socio-economic and institutional context of development. It is essential that such challenges and successes are reported in the international literature, and this paper aims to make a contribution to this important debate.

Integrated Water Resources Management (IWRM) in Nigeria and the CRBDA

In Nigeria, the evolution of IWRM is relatively recent and can be traced to the early 1970s when the first two River Basin Development Authorities were formally established by the federal government. These were the Chad Basin Development Authority in the north-eastern part of the country and the Sokoto-Rima Basin Development Authority in the north-western part (Figure 1). Aware of the need for a comprehensive regional approach to integrated development within the framework of 19 states, the federal military government (FMG) called for a comprehensive review of the Third National Development plan and also created the Federal Ministry of Water Resources (FMWR). The FMWR was required to produce comprehensive recommendations for river basin management. The proposals from the review exercises culminated in the promulgation of the River Basins Development Authorities Decree of 1976. This established nine additional corporate bodies, resulting in a total of 11 River Basin Development Units (Figure 1):

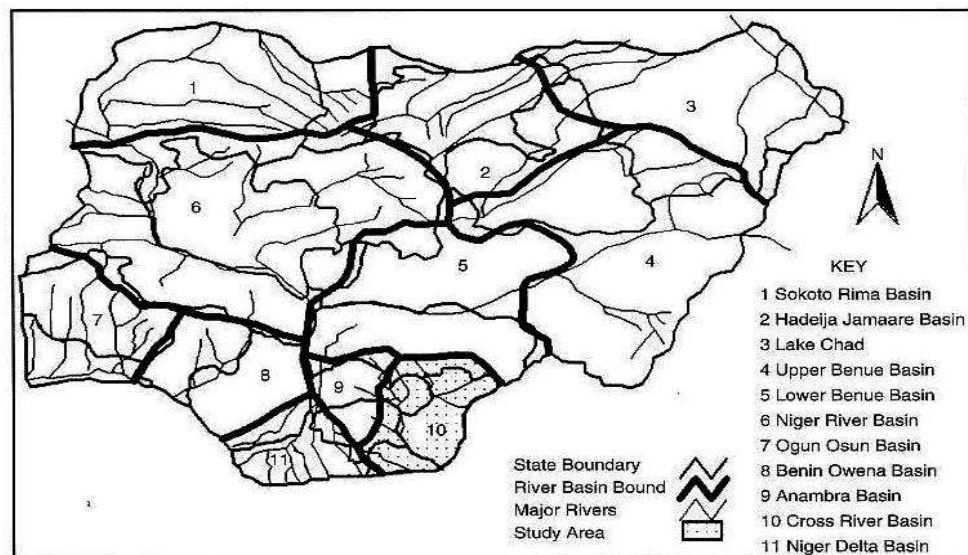


Figure 1. Map of Nigeria showing the Cross river basin

- (1) The Sokoto–Rima River Basin Development Authority
- (2) The Hadejia–Jamaare River Basin Development Authority
- (3) The Chad Basin Development Authority
- (4) The upper Benue River Basin Development Authority
- (5) The lower Benue River Basin Development Authority
- (6) The Cross River Basin Development Authority
- (7) The Anambra–Imo River Basin Development Authority
- (8) The Niger River Basin Development Authority
- (9) The Ogun–Oshun River Basin Development Authority
- (10) The Benin–Owena River Basin Development Authority
- (11) The Niger Delta Basin Development Authority

The 1976 River Basin Development Authority Decree also made provisions for the establishment of the National River Basin Development Coordinating Committee with the express purpose of advising the government on:

- (a) the potential for integrated development of each basin;
- (b) the effect of each Basin Authority's activities on other basins;
- (c) the mechanisms for ensuring even development of the various basins and effecting meaningful coordination; and
- (d) other matters of relevance to the overall development of the country's water resources.

Decree No. 87 of 1979, Section 4 identified the functions of River Basin Development Agencies as follows (Salau, 1986):

- (1) to undertake comprehensive development of both surface and underground water resources for multi-purpose use;
- (2) to undertake schemes for the control of floods and erosion and for watershed management;
- (3) to construct and maintain dams, dykes, polders, wells, boreholes, irrigation and drainage systems and other works necessary for the achievement of the authority's functions;
- (4) to develop irrigation schemes for the production of crops and livestock and to lease the irrigated land to farmers or recognized associations in the locality of the area concerned, for a fee to be determined by the authority with the approval of the commissioner;
- (5) to provide water from reservoirs, wells and boreholes under the control of the authority for the urban and rural water supply schemes on request by the state government and when directed to do so by the commissioner;
- (6) to develop fisheries and improve navigation on the rivers, lakes, reservoirs and lagoons in the authority's area;
- (7) to process crops and livestock produced in the authority's area;
- (8) to control pollution in rivers and lakes in the authority's area in accordance with nationally laid down standards; and
- (9) to resettle persons affected by the works and schemes specified in paragraphs 4 and 5 above or under special resettlement schemes.

It is quite clear from the above account that the Nigerian government viewed the RBDAs as instruments for integrated water resources development. According to Salau (1990), the river basin approach has been adopted in Nigeria in the hope that the resultant integrated control of the nation's water resources would improve water supplies for agricultural, industrial and domestic purposes. Citing specific examples from the list of dams already built, under construction or proposed for the future, Salau (1990) noted that most of these schemes fall far short of the aims mentioned in Decree No. 87 above. Adams (1985, p. 301) also observed that in a number of river basins the development of particular dams or irrigation projects had preceded the establishment of the RBDAs. In many cases, project development preceded the integrated appraisal of water resources available in the basins. This position is supported by Salau's (1990) arguments with respect to the Gongola Basin. It was not until 1977 that a study was commissioned by the Federal Ministry of Water Resources to investigate the long-term development possibilities of the Gongola Basin. By the time the study was concluded, contracts for the construction of the Kiri Dam had already been awarded, despite the study's conclusions that the proposed dam was too big and that development should start with flood control dams in the headwaters of the basin.

The CRBDA is one of the 11 RBDAs in Nigeria. The CRBDA's mandates specifically involve the management of water and related resources in the basin.

The Cross River Basin: Physical Details

The Cross river basin extends between latitudes 4°00'N and 6°50'N and longitudes 7°40'E and 9°40'E. Bounded by lower Benue basin to the north, the Anambra-Imo basin to the west, the Niger Delta basin to the south-west and the United Republic of Cameroon to the east, the Cross river basin includes parts of both Akwa Ibom and Cross river states in

south-eastern Nigeria. With an estimated landmass of 28 620.33 km², the main drainage systems are the Cross, Great and Little Kwas, Calabar, Akpa Yafe, Kwa Ibo and Imo rivers. The Cross river basin has a tropical rainy climate with high rainfall (varying between 1250 mm and 4000 mm per annum depending on location); high temperature (between 22°C and 30°C) and high relative humidity. Groundwater resources vary depending on the location. In the coastal plain, the aquifer is composed of sands with lenses of clay and gravel and the water table is near the surface. The strength of artesian flow varies with the state of the tide. The water table rises more gently than the ground so that in the north of the coastal plain the water table is up to 50 m below the surface. The sands are not a homogeneous aquifer and there is a wide variation in permeability throughout. It is possible that salt-water intrusion may affect boreholes near the coast (CRBDA, 1974).

The basin economy is largely agrarian. Okoji (2001) estimates that well over 80% of the people in the Cross river basin are involved in the production of food and industrial crops, ornamental and medicinal plants, as well as keeping animals. Agricultural practices in this basin are highly season dependent, which is one of the reasons why the CRBDA was established.

Research Methods

A wide range of study methods, including stakeholder meeting, focus group sessions, semi-structured interviews, case studies and observation was used to examine the implementation of IWRM against the original objectives of the CRBDA and the expectations of the people. In-depth interviews were used to collect data from 69 members of CRBDA staff, both at the headquarters at Calabar and at five project units of the Basin Authority: Abak irrigation unit; Itu irrigation and drainage unit; Oniong Nung Ndem irrigation unit; Obubra/Owakande irrigation unit and Nkari earth dam (Figure 2).

These five project units were all adopted for the study because they are the only functional project units of the CRBDA at present. The first four units are all functional and in operation, while Nkari earth dam is still under construction. Nkari earth dam is designed as a multipurpose project. The choice of the dam was informed by the need to address the concerns and expectations of the community. There are many other project units of the CRBDA which are not functional and were not included in data collection. Case studies were conducted at Abak and Oniong Nung Ndem irrigation projects while the rest of the project units were subjected to observation and interviews with officials. Only one village discussion was possible during the research, and this was conducted at Nkari community where the earth dam is located. The water resources stakeholder meeting organized by the CRBDA on 3 May 2005 gave useful insight into institutional issues in the CRB. It is important to stress that the level of water-management activity at each of these project units was not as high as expected, hence the necessity to limit data collection to where the best possibilities were considered. There were follow-up interviews that came in the light of new and unexpected ideas and leads (Glaser & Strauss, 1967; Strauss & Corbin, 1998).

Questions in interviews and focus groups pertained to institutional arrangements for IWRM as well as the challenges and expectations for implementation. This study also benefited from some field exercises and workshops arrived at by the University of Uyo (Nigeria) and Lancaster University (UK) Research Team.

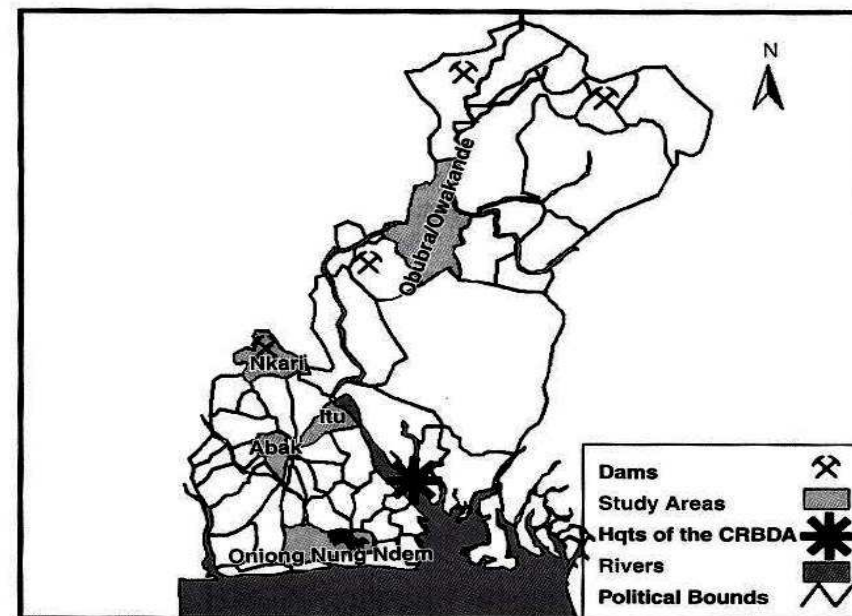


Figure 2. CRB: study areas

There were a number of problems encountered during data collection, including missing financial information, unwillingness to release sensitive financial records and inconsistencies within data sets. Despite these inadequacies, the study provided some useful general evidence and insights.

Current Projects of the CRBDA

Current efforts at managing water and related resources in the Cross river basin are in the areas of water supply (typified by dams as well as surface and groundwater development); food production (irrigation activities); flood and erosion control as well as hydro-meteorological services (Table 1).

From Table 1 above, it is clear that the CRBDA pays particular attention to water resources development and food provision. Three dams are currently receiving attention, namely Obudu, Ijegu Yala and Nkari dams, all of which are at various stages of conception, design and construction. Planned for the upper parts of the Cross river basin catchments, the aim was to alleviate the perennial water problems of these regions and to facilitate improved agriculture. However, what was proposed is a far cry of what exists in reality. For instance, Nkari dam was conceived in the early 1970s and is still at the design stage because of irregular funding and a lack of political commitment while hundreds of rural farmers have been displaced with no commensurate compensation. Currently 154 boreholes are recorded as planned water schemes by the Cross River Basin Development

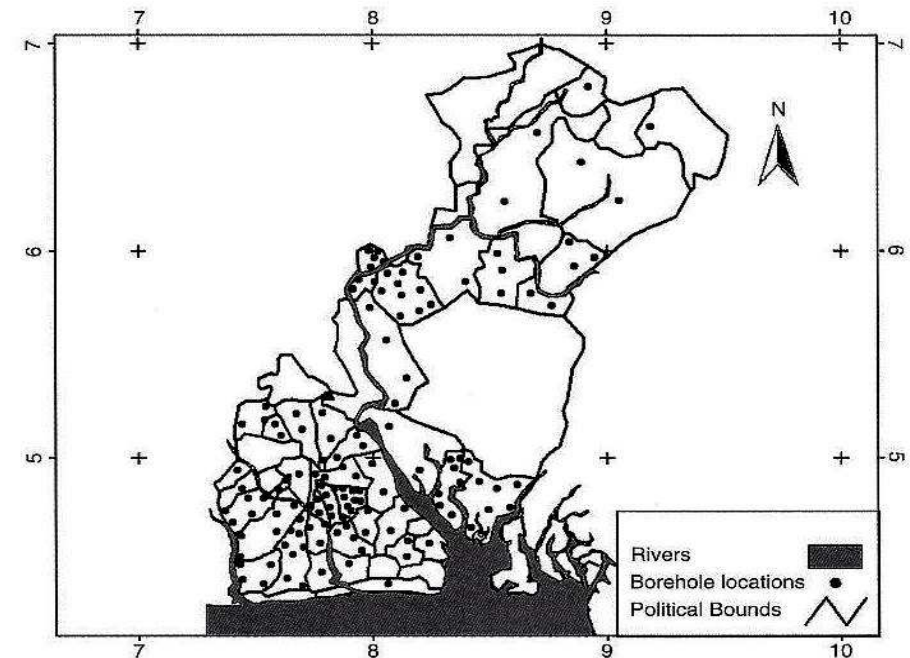
Table 1. Total expenditure and percentage funding to various project sectors in the CRBDA (1990–99)

Project sectors	Total expenditure in million naira (1990–99)	Percentage Expenditure to various sectors (1990–99)	Comments
Dams (Obudu, Ijegu Yala and Nkari)	351.43	45%	None are operational
Borehole and surface water development	234.06	30%	72% completed water schemes up to 1999
Irrigation projects (Calabar, Oniong Nung Ndem, Ogoja, Itu, Obubra/Owakande, Abak, Others)	120.21	15.3%	Only 4 are operational and are not fully utilized
Flood/erosion control	19.56	2.5%	Very few erosion/flood sites managed. Information on erosion and flood sites in the basin incomplete.
Headquarters/area office development	6.77	1%	
Hydromet services	19.56	2.5%	Not effective or reliable
Rehabilitation of plants/machinery	29.21	3.7%	
Total	780.8	100%	

Source: Financial Statements/Annual Reports of the CRBDA (1990–99).

Authority (CRBDA), but only 58% are completed and operational. Figure 3 shows the geographical distribution of boreholes. Efforts of the CRBDA seem to be directed towards areas with less water problems (the lower part of the basin) rather than areas with acute water problems (the upper part of the basin).

A possible explanation for this imbalance relates to corruption and the politicization of water projects. For example, the lower parts of the basin represent urban settlements which harbour the most influential politicians and top government officials. The ability to influence the location of government projects around their settlements demonstrates their influence and power-wielding capacity. Locations that already have many water schemes continue to attract government investment and additional borehole development. Respondents claim that more than 80% of the areas where these water schemes are located do not actually need them because numerous other alternative sources of water supply are available. Another possible explanation for the heavy concentration of water schemes in the lower Cross river basin stems from general corruption within the bureaucracy. It was explained to the researchers that drilling a borehole offers the opportunity to corruptly divert public funds in a number of ways. To sink a borehole in the lower part of the basin would actually cost less, leaving more money for the officials and contractors. For example, the cost of drilling one borehole was officially estimated at 10 million naira in the lower parts of the basin which is almost five times the actual cost. The contrary would

**Figure 3.** CRB: distribution of boreholes

be for the upper parts with less attractive aquifer. Communities inhabiting the upper parts of the Cross river basin are mostly rural dwellers without the political influence and the resources to attract CRBDA projects to their areas. Considering the non-existence of all the dams planned in the upper parts of the basin, it could be argued that the CRBDA has not lived up to the needs of these people nor the mandates for which it was created.

Irrigation projects received the third largest amount of funding in the period 1990–99. There are six irrigation projects in total and at various stages of conception and operation. Four of these schemes are functional, but still are highly under-utilized (Table 2).

All the planned and operational irrigation projects are located in the lower part of the basin, except the Obubra/Owakande project. From Table 2 above, it is clear these projects have not performed to expectations. Many hectares of land have been acquired but with very little development. For example, in Itu, the Basin Authority acquired 2000 ha of land, but only developed 20 ha (1%) between 2002 and 2005. Irrigation infrastructures are not in place and farmers rely on rain-fed farming. There is also the general trend of unwillingness by the farmers to pay for water, which has implications for cost recovery by the CRBDA. Developing irrigation schemes in the lower part of the Cross river basin was probably not a wise decision by the basin authority considering the availability of other sources of natural water supply. More attention should have been devoted in developing and completing available irrigation infrastructures in the upper Cross river basin, rather than new schemes in the lower parts.

Table 2. The performance of irrigation sector in the Cross river basin

Performance Indicators	Scheme			
	Abak	Oniong Nung Ndem	Ilu	Obubra/Owakande
Total hectare of land marked for development	92.6 ha	405 ha	2000 ha	315 ha
Total hectare of land developed	45 ha between 1992–2005	20 ha between 2000–05	20 ha between 2002–05	10.5 ha between 1990–99
% Hectare of land developed	48.6% between 1992–2005	4.9% between 2000–05	1% between 2002–05	3.3% between 1990–99
Average number of participating farmers	129 farmers	250 farmers	46 farmers	21 farmers
Water charges	Subsidized at over 99% Based on voluntary contribution from interested farmers	Subsidized at over 99% Based on voluntary contribution from interested farmers	Rain fed farming Based on voluntary contribution from interested farmers	Subsidized at over 99% Based on voluntary contribution from interested farmers
Tractor hiring services	Full subsidy	Full subsidy	Full subsidy	Full subsidy
Cost recovery or average returns on investments	Surface water	Borehole (groundwater)	Rain fed	Surface water
Sources of irrigation water	Surface and sprinkler	Surface and sprinkler	Not available	Surface and sprinkler
Availability of irrigation infrastructures	From the headquarters of the CRBDA	From the headquarters of the CRBDA	From the headquarters of the CRBDA	From the headquarters of the CRBDA
Funding sources	Mainly for farming	Mainly for farming	Mainly for farming	Mainly for farming
Sectoral water use	None	Yes (started in 2004)	None	None
Presence of Water Users Association (WUA)				

Staff Capacity and Functions

According to the 2003 Nominal Roll, there were a total of 413 staff members employed by the CRBDA (Table 3)

Breakdown of the staff by qualification and functions as well as the numerical strengths by departments and units in the CRBDA is shown in Tables 3 and 4 respectively.

From Table 3, important human resource such as foresters, hydrologists; ecologists, remote sensing, GIS and computer expertise are clearly not present in the CRBDA. These functions are critical to the success of IWRM and have been recognized in the literature (Ingram *et al.*, 1984; Udofia, 1988; Mitchell, 1990; Salau, 1990; Saleth, 2004). An interesting aspect in Table 3 is the preponderance of junior categories of staff, at approximately 81.87%. The drivers, security guards, messengers, typists and head watchmen dominate this category of manpower. Table 4 shows that the largest number of staff of the CRBDA (about 55.45%) are concentrated at the administrative headquarters, while 44.55% are distributed to 14 project units in the basin area, which covers about 28620.33 km². It was clear during field investigations that general staff employment is not guided by needs, rather it is commonly seen as opportunity to have a fair share in the 'National Cake' (a slogan for corruption). Consequently, relatives of management staff and political 'godfathers' are patronized, which accounts for the proliferation of very low-level manpower in the basin.

Based on an opinion survey about human resource capacity conducted among the staff of the basin authority, it was quite clear that the CRBDA is a long way from practising IWRM, as spelt out in the original mandate.

Important concerns border on the non-existence of key functions such as environmental monitoring, research, training and extension, and inter-agency or departmental coordination. Functions such as planning and design, implementation, operation and maintenance,

Table 3. Staff profile by qualification and function

Qualification/Function	Number of staff	(%)
Engineering-related field	17	4.1
Geologists/hydrogeologists	4	0.97
Agriculture-related field	25	6.1
Forestry	Nil	0.00
Hydrologists	Nil	0.00
Ecologists	Nil	0.00
Microbiologists	2	0.5
Geographers	2	0.5
Survey/photogrammetry	2	0.5
Remote Sensing/Geographic Information System experts	Nil	0.00
Economists	1	0.2
Accounting-related field	13	3.15
Legal experts	3	0.73
Computer experts	Nil	0.00
Media-related staff	3	0.73
Public administration	3	0.73
Very low-level manpower	338	81.87
Total	413	100.00

Source: CRBDA Nominal Roll (2003).

Table 4. Staff strengths by departments and units

Departments	Senior staff	Junior staff	Total	(%)
Administration and Finance	53	80	133	32.20
Construction, Operation and Maintenance	37	24	61	14.77
Planning Investigation and Design	17	24	35	8.48
<i>Sub-total</i>	<i>107</i>	<i>128</i>	<i>229</i>	<i>55.48</i>
<i>Units/extension offices</i>				
Obubra Owakande Irrigation Project	2	11	12	2.91
Itu Irrigation/Drainage Project	1	11	12	2.91
Obudu Earth Dam/Irrigation Project	4	21	25	6.05
Ogoja Irrigation Project	7	12	19	4.60
Ijegu Yala Multipurpose Dam/Irrigation Project	1	4	5	1.21
Calabar River Irrigation Project	1	2	3	0.73
Akwa Ibom Area Office	1	16	17	4.12
Abak Irrigation Project	4	20	24	5.81
Onion Nung Ndem Irrigation Project	7	10	17	4.12
Liaison Office, Abuja	2	4	6	1.45
Commercial Services	2	8	10	2.42
Nkari Dam Project	15	13	28	6.78
Ikot Nkim Water Project	Nil	4	4	0.97
Akpap Okoyong Water Project	Nil	2	2	0.48
<i>Sub-total</i>	<i>47</i>	<i>138</i>	<i>184</i>	<i>44.55</i>
Total	154	259	413	100.00

Source: CRBDA Nominal Roll (2003).

although adequate, are heavily under-utilized and redundant because of the current government policy of giving jobs to outside contractors and firms. The majority of the respondents (94%) felt that accountability in management was inadequate. Management decisions are mostly based on closed-door politics, where a few at top management level take decisions, and award contracts without direct consultations with relevant units. This affects all spheres of management. In the award of contracts, political patronage and relatives of top-level management staff are always considered first. One staff member said:

I really pity this place ... on many occasions, tenders are made and people pay heavily for tender fees ... only to discover that the job had been manipulated to favour somebody who has no equipment, but simply because he happens to be one of the relatives of a member in the award team ... that explains why competent contractors are no longer interested in applying anytime there is call for tenders ...

Financing and Management

Since water is a shared federal and state responsibility in Nigeria, the responsibility for financing, cost recovery and management of all irrigation and water supply-related activities within the Cross river basin area are also shared. The two states responsible for the Cross river basin (Akwa Ibom and Cross river states) have their own Utility Boards and Water Boards/Corporations. The federal government finances most of the capital projects, such as irrigation and dam projects, and also most rural water resources projects.

The state governments also finance some urban and rural water projects in their domain from their own revenue, from their share from the centrally collected revenue proceeds and from loans from financial institutions both within and outside the country. For example, the Akwa Ibom State Rural Water Supply and Sanitation Programme (AKRUWATSAN) is the state-level version of the National Rural Water Supply and Sanitation Programme and also an African Development Bank (ADB) assisted urban water supply project. However, although the federal government always guarantees external borrowings, each state government executes its water resources projects through their respective Utility Boards and Water Corporations. There are a number of other related institutions responsible for water resources management apart from the CRBDA and states water agencies. The resulting arrangement is a mess of complicated and fragmented institutional arrangements, with no centralized authority.

There is an absence of coordination among various institutions within the water sector and other sectors. Coordination is not only absent between policy and practice domains but also among organizations at the policy-making level. For example, at the federal level, the water resources Decree of 1993 vests the rights of administration of the water resources in the secretary, which in this case, is the authority of the FMWR. Other Ministries such as Agriculture and Natural Resources, Environment, Rural Development and Power and Steel are left with no responsibilities for the Decree, despite their direct or indirect activities which involve the use, provision and management of water resources in their states. At the state and local government levels, coordination among agencies, ministries and parastatals with shared interests is non-existent. The two state governments in the basin operate separate water schemes in both rural and urban areas within their respective political boundaries. The 48 local government areas within the CRB also have their various water schemes in addition to the national and state water schemes. The resulting scenario is a multitude and maze of duplicated and parallel water schemes within the basin. For example, at Ibesikpo Asutan LGA of Akwa Ibom State, the CRBDA has nine water schemes; Akwa Ibom State Rural Water and Sanitation Programme has an estimated 11 water schemes; Akwa Ibom Water Company Ltd has six water schemes, while the Ibesikpo Asutan LGA has 17 water schemes. Other water schemes from numerous other agencies, communities, NGOs and politicians (in the form of political constituency projects) also exist. Furthermore, water is not a problem in many of the beneficiary communities.

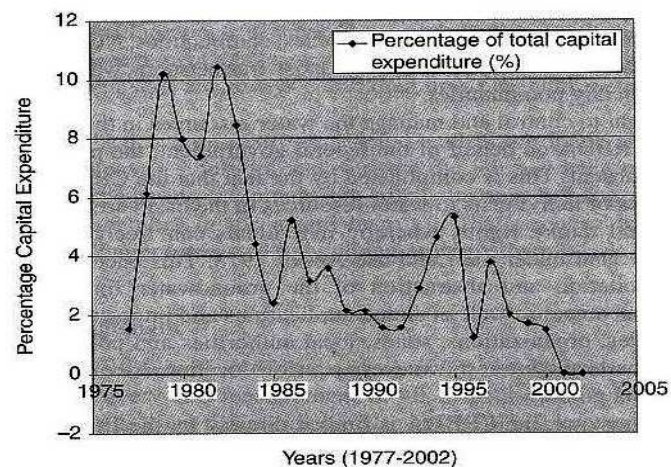
Whereas the right to control and manage the water resources in the basin area is clearly allocated to the CRBDA on behalf of the federal government, the power of enforcement and regulation is absent. This is complicated by the fact that the CRBDA has no working by-laws. The rights of individuals to water resources in the basin are more determined by, and linked to, land tenure rights, whereby individuals can freely access groundwater resources on their land under the Land use Act of 1978. This encourages and promotes unregulated exploitation and abstraction of the groundwater for the private market (especially in urban areas) as well as undue duplications and imposition of water schemes by parallel agencies, organizations, states, local authorities and political representatives (with different agenda and interests) at every possible location, for either commercial gain or to score political points.

As a federal parastatal, the CRBDA is funded directly by the Federal Government of Nigeria through the Federal Ministry of Water Resources (FMWR). Over the years, the general funding trend for water resources in Nigeria has not been regular (Table 5 and Figure 4).

Table 5. Financial allocation to water resources sector in Nigeria (1977–2002)

Year	Capital expenditure on water resources (millions of naira)	Percentage of total capital expenditure (%)
1977	355.4	1.54
1978	1035	6.12
1979	2561.4	10.20
1980	2549.5	7.96
1981	1459.4	7.41
1982	2505.1	10.44
1983	1721.6	8.43
1984	614.9	4.42
1985	471.8	2.41
1986	1094	5.21
1987	452	3.16
1988	994.40	3.59
1989	529.80	2.13
1990	729.50	2.14
1991	561.90	1.57
1992	751.40	1.57
1993	1659.30	2.90
1994	4313.60	4.64
1995	7103.30	5.31
1996	1741.20	1.21
1997	13 220.30	3.78
1998	11 390.80	2.02
1999	6923.90	1.68
2000	13 529.90	1.47
2001	No Allocation	0.00
2002	No Allocation	0.00

Source: Calculated from CBN Records (2003).

**Figure 4.** Trend in federal government capital expenditure on water resources 1977–2002

Various writers have noted the problem of inadequate capital funding for the water resources sector in Nigeria (Mitchell, 1990; Salau, 1990; Akpabio, 2004). Are & Fatokun (1984) observed that some 'projects', which took years of painful feasibility studies, aerial photography and detailed engineering efforts to design cannot be implemented due to poor funding. With very low prospects of cost recovery for investments made on water resources, it is very clear that the possibility of sustainable integrated water resources management in the Cross river basin is remote under present conditions and arrangements.

Emerging Challenges

From the above discussions, the strong influence of macro-level institutional processes on the performance of the CRBDA as an institution is very evident. The key point is that the CRBDA is tied to the larger institutional and governmental processes and structures in Nigeria, from which it derives its primary powers and responsibilities. The implication is that CRBDA activities and programmes are directly or indirectly affected by weaknesses in overall water policy, legal arrangements and administrative processes at the macro level. Nigeria has been through a succession of military dictatorships since independence in 1960. The River Basin Development Authority policy came as part of such political changes in 1976, and has since passed through further reforms precipitated by political and economic change and instability at the national and regional scale (Mitchell, 1990). The consequences of such changes have included declining government funding for water management, fragmented and inconsistent policy development and implementation, and variable political commitment for tackling land and water problems. This is further complicated by the widespread problem of official corruption and bias at every level of decision making and implementation. For example, the office of the Federal Minister for water resources in Nigeria is exclusively reserved for candidates from the northern region. Ethnic politics takes precedence over qualifications, partly because of acute scarcity of water resources in the northern region but also because the power relations in Nigeria favour the northern region. With ethnic politics, funding attention to the RBDAs is also ethnically centred and favours River Basin Authorities in the northern regions.

The public good character of water in Nigeria necessitates public ownership and state involvement in development and distribution. As such, the CRBDA is run as a social service and non-profit making organization. The organization receives irregular revenue from the federal government. In most cases, such revenue is not well managed due to contract inflation, sub-contracts, kickbacks and 'political patronage syndromes'.

It is also important to note that the legal arrangements that deal with water, land, and environmental resources in Nigeria are very weak, and do not recognize the intricate ecological linkages between water and other related resources. Consequently, the idea of a conjunctive or coordinated management approach is not widely acknowledged at the policy and implementation level. The CRBDA must work with a number of other institutions and management agencies within its area of jurisdiction, but apparently has no authority and power of control over them. Each of these agencies and institutions are guided by separate sets of by-laws and edicts for operation. Consequently, the CRBDA is faced with the task of having to contend with these multiple agencies and institutions with disparate sets of working laws and legislations, although it does not have an operational by-law of its own. The implication is that the basin authority is operating at the mercy of these fragmented institutions. This current institutional arrangement no doubt limits the

Various writers have noted the problem of inadequate capital funding for the water resources sector in Nigeria (Mitchell, 1990; Salau, 1990; Akpabio, 2004). Are & Fatokun (1984) observed that some 'projects', which took years of painful feasibility studies, aerial photography and detailed engineering efforts to design cannot be implemented due to poor funding. With very low prospects of cost recovery for investments made on water resources, it is very clear that the possibility of sustainable integrated water resources management in the Cross river basin is remote under present conditions and arrangements.

Emerging Challenges

From the above discussions, the strong influence of macro-level institutional processes on the performance of the CRBDA as an institution is very evident. The key point is that the CRBDA is tied to the larger institutional and governmental processes and structures in Nigeria, from which it derives its primary powers and responsibilities. The implication is that CRBDA activities and programmes are directly or indirectly affected by weaknesses in overall water policy, legal arrangements and administrative processes at the macro level. Nigeria has been through a succession of military dictatorships since independence in 1960. The River Basin Development Authority policy came as part of such political changes in 1976, and has since passed through further reforms precipitated by political and economic change and instability at the national and regional scale (Mitchell, 1990). The consequences of such changes have included declining government funding for water management, fragmented and inconsistent policy development and implementation, and variable political commitment for tackling land and water problems. This is further complicated by the widespread problem of official corruption and bias at every level of decision making and implementation. For example, the office of the Federal Minister for water resources in Nigeria is exclusively reserved for candidates from the northern region. Ethnic politics takes precedence over qualifications, partly because of acute scarcity of water resources in the northern region but also because the power relations in Nigeria favour the northern region. With ethnic politics, funding attention to the RBDA is also ethnically centred and favours River Basin Authorities in the northern regions.

The public good character of water in Nigeria necessitates public ownership and state involvement in development and distribution. As such, the CRBDA is run as a social service and non-profit making organization. The organization receives irregular revenue from the federal government. In most cases, such revenue is not well managed due to contract inflation, sub-contracts, kickbacks and 'political patronage syndromes'.

It is also important to note that the legal arrangements that deal with water, land, and environmental resources in Nigeria are very weak, and do not recognize the intricate ecological linkages between water and other related resources. Consequently, the idea of a conjunctive or coordinated management approach is not widely acknowledged at the policy and implementation level. The CRBDA must work with a number of other institutions and management agencies within its area of jurisdiction, but apparently has no authority and power of control over them. Each of these agencies and institutions are guided by separate sets of by-laws and edicts for operation. Consequently, the CRBDA is faced with the task of having to contend with these multiple agencies and institutions with disparate sets of working laws and legislations, although it does not have an operational by-law of its own. The implication is that the basin authority is operating at the mercy of these fragmented institutions. This current institutional arrangement no doubt limits the

capacity of the CRBDA to promote and effectively implement integrated water resources management in its area.

Concluding Remarks

Clearly, IWRM has not achieved the expected or desired level of success in the Cross river basin. It is evident that a number of significant problems exist, which include legal, political, administrative and financial constraints, as have been discussed previously in this paper. The CRBDA has been given legal responsibility for the management of water resources in the basin, but lacks the necessary supporting legal, political and economic power to fulfil these obligations through enforcement and regulation. In the present arrangements, there are conflicts regarding authority and tension between the CRBDA and many other local, state and federal institutions, making a coordinated or integrated approach practically impossible. There are other local peculiarities and circumstances which also work against IWRM in the CRBDA. These include abundance of water resources, endemic corruption and ethnic politics. For example, in the case of abundant water resources, the need for IWRM is not fully appreciated, particularly when taking into account the likely low level of user participation in project financing and cost recovery. At the present time, it is very difficult getting people to pay for IWRM initiatives when rainfall is abundant and most immediate water demands can be met. Reflecting on the functions of the CRBDA as spelt out by Decree No. 87 of 1979, it could be argued that in enacting this law, too little attention was given to the geographical diversities within Nigeria by policy makers. Although the Decree may have resulted in some significant improvements in water use and management in the northern geographical regions, the same is not true in the south. This lack of sensitivity to regional variations explains why all of the River Basin Development Authorities have a uniform set of functions, comparable organizational structures as well as very similar approaches for water management. This 'one size fits all' approach to institutional design accounts for many of the implementation failures which are evident in several regions, including the Cross river basin.

Given these current circumstances and problems, there is an urgent need for institutional reforms aimed at bolstering the authority and operational capacity of the CRBDA. Without this, the gap between the stated aims of Decree No. 87 and actual practices will not be reduced in the future. Specifically, the role of the CRBDA should be one of coordinating the policies and practices of the many other organizations with responsibilities for land and water and regulating the development, allocation, use and disposal of water using permits, licences, monitoring and enforcement. However, the CRBDA cannot hope to achieve this elevated position within the bureaucracy without strong support from political leaders at the regional and national levels and the necessary financial resources to carry out these functions effectively.

Acknowledgements

The study benefited from funding from the Commonwealth Scholarship Commission (CSC) in the UK. The authors are grateful to the following: the CRBDA; the Department of Geography and Faculty of Science and Technology (FST), Lancaster University, UK; and the Field Assistant, Elizabeth Utin. The views expressed in this paper are solely those of the authors and not the institutions named above.

References

- Adams, W. M. (1985) River basin planning in Nigeria, *Applied Geography*, 5, pp. 297–308.
- Akpabio, E. M. (2004) The status of water supply and management in the Cross River Basin, S.E. Nigeria. Paper presented at Water Resources Management Workshop, Loskop Dam, South Africa, 8–11 November.
- Are, L. & Fatokun, J. (1984) River Basin Development Authorities and irrigation. Paper presented at the conference on strategies for the Fifth National Development Plan 1986–1990. Organised by NISER and the Federal Ministry of National Planning at Ibadan, 25–29 November.
- Australian Water Resources Council, Australian Environment Council, and Australian Soil Conservation Council (1988) *Proceedings of the National Workshop on Integrated Catchments Management*, Australian Water Resources Council Conference Series No. 16 (Melbourne: Victoria Department of Water Resources).
- Biswas, A. K. (2004) Integrated Water Resources Management: A Reassessment. A Water Forum Contribution, *Water International*, 29(2), pp. 248–256.
- Bose, S. C. (1948) The Damodar Valley Project, Phoenix, Calcutta.
- Burton, J. R. (1986) The total catchments concept and its application to New South Wales, in: *Proceedings of the Hydrology and Water Resources Symposium, River Basin Management, Institution of Engineers*, pp. 307–311 (Barton, Australia: ACT).
- CBN (2003) *Statistical Bulletin-Public Finance*. Vol. 13, Part B (Abuja: Central Bank of Nigeria).
- Clapp, G. R. (1955) *The TVA: An Approach to the Development of a Region* (Chicago: University of Chicago Press).
- CRBDA (2004) Information brochure (Calabar: Cross River Basin Development Authority).
- CRBDA (1974) *Cross River Basin Pre-feasibility Report* (Federal Ministry of Agriculture and Natural Resources in Nigeria).
- Cunningham, G. M. (1986) Total catchments management—resource management for the future, *Journal of Soil Conservation, New South Wales*, 42(1), pp. 4–5.
- Dovers, S. R. & Day, D. G. (1988) Australian rivers and statute law, *Environmental Planning and Law Journal*, 5(1), pp. 90–108.
- Embid, A. (2003) The transfer from the Ebro basin to the Mediterranean basins as a decision of the 2001 National Hydrological Plan: the main problems posed, *International Journal of Water Resources Development*, 19, pp. 399–411.
- Faniran, A. (1972) River basins as planning units, in: K. M. Barbour (Ed.) *Planning for Nigeria: A Geographical Approach*, pp. 128–154 (Ibadan: Ibadan University Press).
- Faniran, A., Akintola, F. W. & Okechukwu, G. C. (1977) Water resources development process and design: case study of the Oshun river catchments, in: A. L. Mabogunje & A. Faniran (Eds) *Regional Planning and National Development in Tropical Development* (Ibadan: Ibadan University Press).
- Funnell, B. M. & Hey, R. D. (Eds) (1974) *The Management of Water Resources in England and Wales* (Farnborough: Saxon House).
- Glaser, B. G. & Strauss, A. L. (1967) *The Discovery of Grounded Theory* (Chicago: Aldine).
- Harrison, P. & Sewell, W. R. D. (1976) La re-organization economique et region ale de la gestion des eaux en France, *Cahiers de Geographie de Quebec*, 20(49), pp. 127–142.
- Howard, R. (1988) A New Zealand perspective on integrated catchments management. Working Papers for the National Workshop on Integrated Catchments Management, Australian Water Resources Council, Melbourne, pp. 101–131.
- Ingram, H. M., Mann, D. E., Weatherford, G. D. & Cortner, H. J. (1984) Guidelines for improved institutional analysis in water resources planning, *Water Resources Research*, 20, pp. 323–334.
- Johnson, S. H. (1979) Improving water management in the Indus basin, *Water Resources Bulletin*, 15(2), pp. 473–495.
- Kirby, C. & White, W. R. (Ed.) (1994) *Integrated River Basin Development* (Chichester: John Wiley).
- Kirk, W. (1950) The Damoda Valley—Valles Optima, *Geographical Review*, 40, pp. 415–443.
- Kraenzel, C. F. (1957) The social consequences of river basin development, *Law and Contemporary Problems*, 22, pp. 221–236.
- Kyle, L. H. (1958) *The Building of TVA* (Baton Rouge, LA: Louisiana State University Press).
- Lamour, P. (1961) Land and water development in Southern France, in: H. Jarrett (Ed.) *Comparisons in Resource Management*, pp. 227–250 (Baltimore: Johns Hopkins Press).
- Lilienthal, D. E. (1944) *TVA: Democracy on the March* (New York: Harper and Bros).

- Mitchell, B. (1990) Introduction, in: B. Mitchell (Ed.) *Integrated Water Management: International Experiences and Perspectives*, pp. 1–21 (London: Belhaven).
- Mitchell, B. & Pigram, J. J. (1989) Integrated Resource Management and the Hunter Valley Conservation Trust, NSW, Australia, *Applied Geography*, 9, pp. 196–211.
- Okoji, M. A. (2001) Agriculture, in: I. B. Inyang (Ed.) *Southeastern Nigeria: Its Environment*, pp. 122–134 (Kaduna: Abaam Press).
- Okun, D. A. (1977) *Regionalization of Water Management: A Revolution in England and Wales* (London: Applied Science Publishers).
- Olayide, S. O., Olayemi, J. K. & Eweka, J. A. (1979) *Perspectives in Benin-Owena River Basin Development* (Ibadan: Centre for Agricultural and Rural Development).
- Rahaman, M. M. & Varis, O. (2005) Integrated Water Resources Management: evolution, prospects and future challenges, *Sustainability: Science, Practice, & Policy*, 1(1). Available at <http://ejournal.nbii.org>
- Ransmeier, J. S. (1942) *The Tennessee Valley Authority: A Case Study in the Economics of Multiple Purpose Stream Planning* (Nashville, TN: Vanderbilt University Press).
- Rondinelli, D. A. (1981) Applied policy analysis for Integrated River Basin Development Programs: a Philippines case study, in: S. K. Saha & C. J. Barrow (Eds) *River Basin Planning: Theory and Practice*, pp. 285–323 (Chichester: John Wiley).
- Saha, S. K. (1979) River basin planning in the Damodar Valley of India, *Geographical Review*, 69(3), pp. 273–287.
- Salau, A. T. (1986) River basin planning as a strategy for rural development in Nigeria, *Journal of Rural Studies*, 32(4), pp. 321–335.
- Salau, A. T. (1990) Integrated Water Management: the Nigerian Experience, in: B. Mitchell (Ed.) *Integrated Water Management: International Experiences and Perspectives*, pp. 188–202 (London and New York: Belhaven Press).
- Saleth, R. M. (2004) Strategic Analysis of Water Institutions in India: Application of a New Research Paradigm. Research Report 79. (Colombo, Sri Lanka: International Water Management Institute).
- Sewell, W. R. D., Handmer, J. W. & Smith, D. I. (Eds) (1985) *Water Planning in Australia: From Myth to Reality* (Canberra: Centre for Resource and Environmental Studies, Australian National University).
- Strauss, A. & Corbin, J. (1998) *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory* (Thousand Oaks, CA: Sage).
- Udofia, W. E. (1988) The role of river basins and Rural Development Authorities in the development process, *Third World Planning Review*, 10(4), pp. 405–416.
- Wengert, N. (1981) A critical review of the river basin as a focus for resources planning, development, and management, in: R. M. North, L. B. Dworsky & D. J. Allee (Eds) *Unified River Basin Management*, pp. 9–27 (Minneapolis: American Water Resources Association).