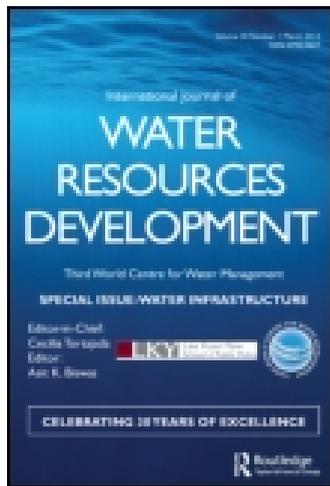


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Legislative and institutional reforms for water resources management in Ghana

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The management of water resources among traditional societies in Ghana has been based on indigenous knowledge systems and practices. Colonial administrations subsequently vested water administration at the central level, without proper coordination, resulting in disjointed management systems. When a new constitution was adopted in 1992, constitutional requirements resulted in an overhaul of the legislative and institutional framework for water resources management. The old sector-based legislative instruments have been reviewed; a Ministry of Water Resources, Works and Housing has been created for policy direction; and an act of Parliament has established a Water Resources Commission to regulate and manage the utilization of Ghana's fresh-water resources.

Keywords: Ghana; IWRM; institutions; legal reforms; decentralization

Introduction

The African context

During the last two decades, some regional economic groups and individual countries in Africa have taken steps to review management practices in the water sector. In West Africa, the Economic Community of West African States (ECOWAS) has promoted and facilitated action in developing a systematic approach to integrated water resources management (IWRM). ECOWAS adopted a regional action plan for IWRM in December 2000 and established a permanent framework for coordination and monitoring to assist member states in dealing with challenges associated with water resources management (ECOWAS, 2008).

A number of countries in the region, including Burkina Faso, Senegal, Mali and Niger, have been engaged in water resources management review processes. Burkina Faso adopted an action plan for IWRM (PAGIRE) in 2003 and has made commendable progress in terms of water-sector restructuring and institutional renovation. Major constraints in the process, however, relate to technical organization, lack of essential competencies and financial support (Spooner, 2011).

Countries in the East African region are at different stages of development with respect to establishment of policy and legal frameworks for water resources management. Kenya has developed a Water Act to promote IWRM and has designed policies and plans to implement IWRM (Republic of Kenya, 2002). Uganda has developed a Water Action Plan (Republic of Uganda, 1995a), a Water Statute (Republic of Uganda, 1995b) and a Water Policy (Republic of Uganda, 1999). Implementation challenges identified in Uganda

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concern over-reliance on foreign financing, and a lack of staff resources and technical expertise (Bashaasha, Mangheni, & Nkonya, 2011).

A status report presented at the fourth Africa Water Week Conference, in Cairo, May 2012 on the application of integrated approaches to water resources management in Africa indicated that 75% of African countries were implementing water laws with an integrated approach and 44% were implementing national IWRM plans. However, major constraints identified in the implementation process, related to lack of organizational capacity, technical coordination, enforcement, and financial mobilization, resulting in overdependence on donor support. African countries must therefore approach IWRM as a conscious long-term process (AMCOW, 2012).

The Ghanaian context

Issues related to water are not new, and certainly not in Ghana. The history of the different groups of people that presently make up the population of Ghana is full of stories that record their close connections with water in its different forms. Settlement patterns across the country are largely determined by availability of water in one form or another, and the names of such settlements reflect their location.

In connection with management of water resources, therefore, every traditional area in the country has its institutions and management practices which are based on indigenous knowledge systems developed over centuries of practices and experience. These knowledge systems, together with unwritten laws and regulations, have guided the management of water resources throughout the country's history with respect to conservation, pollution control, protection of catchment areas and protection of fisheries. In Ghana, some of these traditional practices may be shrouded in myth, superstition or religious belief systems, but are all meant to ensure conservation and the sustainable management of the precious resource for posterity (Opoku-Agyemang, 2001).

At the national level, various government and nongovernmental institutions, backed by separate pieces of legislation and mandates, have used and managed the country's water resources in their individual interests, with little regard for coordination and sustainability (Odame-Ababio, 2003). As early as the 1990s, the colonial government enacted the Rivers Ordinance (1903), which gave powers to the minister responsible for water resources to control the use of water. Subsequent enactments enabled specific government agencies to perform functions related to water. For example, the Forest Ordinance (1927) made provision for catchment protection and control of water abstraction in forest reserves, and the Land Planning and Soil Conservation Act (1953) provided for soil conservation and the control of watercourses (Ministry of Works and Housing, 1998).

However, the adoption of the 1992 Constitution transformed the water resources management scene in Ghana (Republic of Ghana, 1992). The institutional and legislative framework has undergone review, and the country's stock of water resources is being managed differently. At the policy level, a Ministry of Water Resources, Works and Housing (with a Water Directorate) has been created. A Water Resources Commission has been established by an act of Parliament (Act 522 of 1996) with the mandate to regulate and manage the country's water resources and coordinate government policies related to water (Water Resources Commission, 1996). A National Water Policy has been adopted (Ministry of Water Resources, Works and Housing, 2007) and an IWRM Plan has been prepared (Water Resources Commission, 2012b).

Ghana's water resources endowment and competing uses

Ghana's freshwater resources are classified into surface water and groundwater. The mean annual rainfall of the country is estimated at 1187 mm. Annual potential open evaporation has been estimated as ranging from 1350 mm in the south to about 2000 mm in the north. The total annual runoff is 56.4 km³ of which about 40 km³ is generated internally (MWRWH, 2007).

The available water resources are subject to competing uses. These can be categorized as consumptive and non-consumptive. The main consumptive uses are water supply for domestic and industrial uses, irrigation and animal husbandry. With respect to surface-water resources alone, the consumptive water demand for 2020 is projected to be 5 km³, which is equivalent to some 12% of the total water resources (Ministry of Water Resources, Works and Housing, 2011a).

Available data indicate that the proportion of the Ghanaian population that uses improved drinking water has increased significantly, from 54% in 1990 to 82% in 2008. The proportion of the urban population with access to improved drinking water has increased from 84% in 1990 to 90% in 2008, while in the rural population it increased from 37% in 1990 to 74% in 2008 (WHO/UNICEF-JMP, 2010). The considerable improvement in drinking water coverage was achieved partly through the institutional reforms in the water sector. However, the current national water coverage suggests that there is still some shortfall in the provision of potable water throughout the country, especially in rural areas, low-income communities and peri-urban areas (Ministry of Water Resources, Works and Housing, 2011b).

The main non-consumptive water uses are inland fisheries, water transport and hydropower generation. Major reservoirs including the Akosombo, Kpong and Bui have been constructed for hydropower supply, whilst medium and small impoundments such as the Weija, Tono, Barekese, Tanoso and Owabi have been constructed for consumptive uses such as potable water supply and irrigation. The largest hydro-electric dam in the country was constructed on the Volta River in 1965, creating one of the largest artificial lakes in the world. It covers an area of about 8500 km².

Legislative framework in the water sector

Sectoral legislation

Prior to Ghana's independence in 1957, the Rivers Ordinance (1903) was the first attempt to comprehensively control the use of water. There was no follow-up to this ordinance, which was therefore overtaken by time and other enactments. The second colonial legislation was the Forest Ordinance (1927), aimed at ensuring the conservation and management of forest areas as a commodity as well as a resource. The British Gold Coast colony practised the British common law legal system, under which the owner of any land abutting on water, known as the riparian owner, has unrestricted access to the water (Opoku-Agyemang, 2001). In view of that practice, the Rivers Ordinance did not vest ownership of water resources in the state. Towards the end of colonialism and soon after independence, the two ordinances become ineffective (Adjei & Ampomah, 2009).

Following Ghana's independence in 1957, a number of statutes and legislations related to water resources management and use were passed. For example, the Volta River Development Act (1961) set up the Volta River Authority (VRA) for the development and generation of hydropower as well as the regulation of water use of the Volta River or the Volta Lake. Decree 1977 SMCD of 1985 gave power to the [Ghana Irrigation Development](#)

Authority (GIDA) (1985) to make regulations on the use of any reservoir created for any irrigation project, taking the national interest into consideration. Section 21 of the Minerals and Mining Law (1986) stipulated that any corporate or private person who sought to develop infrastructure and use water resources in the mining sector needed governmental approval, which was vested in the mining sector minister. Under Act 310 of 1965, the Ghana Water and Sewerage Corporation (GWSC) (1965) had preference over other authorities in the use of water resources for water supply. Other water-related legislation that allowed individual institutions to carry out independent water-related functions included the Fisheries Law (1991) and the Land Title Registration Decree (1986) (see also Ministry of Works and Housing, 1998).

In the process of these post-independence developments, there was hardly any consideration of the linkages or interdependency of functions and roles in the water sector. This increasingly led to conflicts between the various legislative acts, especially regarding the objectives and functions of the various institutions. Indeed, the VRA, GWSC and GIDA did not comply with the Rivers Ordinance or the Forest Ordinance, which were the regulating legislation then in force, before constructing dams or abstracting water for their operations. In addition, there is no evidence to show that any of these state institutions exercised their power to make regulations to give better effect to the implementation of the laws. This was one major contributory factor to the poor record of compliance with water use regulations in Ghana (Adjei & Ampomah, 2009).

Legislative changes in the water sector

Since the 1990s, actions have been initiated to address the constraints to the sustainable development and management of the country's fresh-water resources. These include water-sector reforms; coordination of national water resources management; and strengthening of water resources information agencies.

These initiatives started with some changes in legislation to redefine the status and mandates of some water-sector institutions. For instance, there was the establishment of the Ghana Water Company Limited (GWCL), responsible for urban water supply (Conversion of Companies Act (2003) as amended by LI 1648); the Community Water and Sanitation Agency (CWSA) Act (1998) for rural water supply; the Environmental Protection Agency (EPA) Act (1994) for the general protection of the environment; the Public Utilities Regulatory Commission Act (1997) to regulate the provision of utility services, including approving tariff levels and drinking-water quality for treated water to consumers; and the Water Resources Commission (WRC) Act 522 (1996) to regulate and manage the utilization of Ghana's fresh-water resources and to coordinate related policies.

In creating the WRC, Act 522 repealed Parts I and II of the Rivers Ordinance (CAP 226 of 1903), but Part III of that ordinance, relating to the provisions on "licensing for dredging, steam vessels and the power to issue regulations to protect and improve navigability, fishing, timber, mining, etc.", has not been repealed but remained dormant and ineffective (WRC, 1999).

To analyze the mandates, overlaps and conflicts in relation to other sector legislation, the WRC in 1999 instituted a study aimed at harmonizing conflicting legislation with Act 522. The study also addressed conflicts and ambiguities in the act itself, including resolution of conflicts of interest within the WRC, transitional provisions, parliamentary ratification of water use permits, right of compensation and international relations.

The study found a number of overlaps with the mandates of other institutions. For example, both the WRC and the VRA are invested with final authority on the management, utilization, and conservation of the resources of the River Volta.

The study therefore recommended the repeal or amendment of the conflicting law in one case by applying the legal principles of *lex specialis* and *lex posteriori*. The idea is that conflicting legislation which was adopted before the WRC legislation and which is more general than the specific mandates of the WRC act has implicitly been either repealed or modified. These principles are recognized by the court system in Ghana. However, the general recommendation was for the WRC to work in close collaboration and cooperation with other institutions governed by conflicting legislation (WRC, 1999).

The WRC has pursued the general recommendation, but there has been little progress towards the repeal or amendment of conflicting laws. The WRC has pursued dialogue with the EPA on the conflicting responsibility for wastewater discharges, which has resulted in a well-functioning and operative memorandum of understanding on the responsibility, preparation and issuance of wastewater discharge permits. In the case of the WRC and VRA, an informal collaboration on responsibilities for regulating water use on the Volta has been established. The VRA refers all prospective water users of the Volta Lake and only expresses its “no objection” or otherwise of an application to the WRC.

Institutional framework

Post-independence institutional framework

The period after independence witnessed the establishment of water-sector institutions specifically for water development and not so much for the management of the resource. The first water-user institution, the VRA, was the only institution with a mandate that extended over the entire Volta Basin in Ghana. The GWSC (now Ghana Water Company Limited) was launched to provide, supply, distribute and conserve the nation’s water resources for public, domestic and industrial purposes. The GIDA has the responsibility of formulating plans and implementing programmes for irrigation development and for the efficient use of irrigated lands (Ministry of Works and Housing, 1998).

In addition, three agencies were set up for data collection and management. The first was the Meteorological Services Department now the Ghana Meteorological Agency (GMet) – which is responsible for collecting, processing and assessing meteorological data. The Hydrological Services Department (HSD) collects, processes and assesses hydrometric data, while the Water Resources Research Institute now the Water Research Institute (WRI) focuses on studies of water resources. These agencies also serve other government departments and agencies, local authorities, and the general public.

The creation of the water-user institutions, which deal with single-purpose water use and serve sectoral interests, left the water sector largely lacking in policy direction, coordination and collaboration. This lack of coordination and collaboration of activities in the water sector increasingly led to conflicts in objectives and functions, leaving the country’s water resources largely unmanaged. The situation called for an overall institution to give a national direction to the regulation and management of water resources in the country (WRC, 2002).

Institutional reforms

In Ghana, the 1990s constitute a landmark period of reforms that were designed to move the country away from the uncoordinated and unsustainable management of water

resources. These reforms were also dictated by governance initiatives outside of the water sector itself, such as the adoption of the country's 1992 Constitution. During this period, administrative and political reforms were undertaken aimed at the devolution of power from the central government to the district administrations (district assemblies) and lower levels of governance (WRC, 2002).

The economic, administrative and political reforms were accompanied by direct reforms in the water sector that were specifically intended to improve efficiency in rural, urban and irrigation water supply, as well as to attain some measure of environmental protection and conservation. The initial reforms were sectoral in nature; this approach could improve existing water sub-sectors and make them more efficient, but could not achieve integration of water resources management (WRC, 2002).

The key challenges that were accordingly identified from these sector reforms included:

- the absence of overall regulation, management and coordination of water resources
- institutional weaknesses among information and development agencies in the water sector
- inadequate participation of stakeholders in policy formulation and decision making.

Hence, the need for a coordinated management framework.

The government of Ghana therefore created the Water Resources Commission (WRC) through an act of Parliament (Act 522 of 1996) to address the constitutional provisions regarding the management of the country's natural resources. Water, as an essential natural resource, falls within the provisions of Article 269 of Ghana's 1992 Constitution, which seeks to ensure the regulation, management and protection of natural resources. Furthermore, Section 12 of the WRC Act stipulates that "the property in and control of all water resources is vested in the President on behalf of, and in trust for the people of Ghana". The vesting of the water resources in the president is to make water resources management consistent with general natural resources management in Ghana as provided in the 1992 Constitution (Adjei & Ampomah, 2009).

The WRC represents a forum for the integration, cooperation and coordination of diverse interests and includes the major stakeholders in the water sector. The commission consists of 15 members, including the chairman, the executive secretary, and a representative each for women and NGOs in the water sector. Other institutions represented on the commission include those in charge of hydrological and meteorological services (HSD and GMet, respectively), water research (WRI), urban and rural water supplies (GWCL and CWSA, respectively), irrigation development (GIDA), hydro-electric power generation (VRA), environmental protection (EPA), forestry (Forestry Commission), minerals (Minerals Commission), and chieftaincy, i.e. traditional authority.

Under the reformed institutional setting, the main operational areas for ensuring the effective management of water resources can be grouped into the following categories: coordination and collaboration; regulatory activities; management of river basins; capacity building, information and education; and transboundary water management initiatives.

Coordination and collaboration

The Ministry of Water Resources, Works and Housing (MWRWH) is the principal government ministry responsible for overall policy formulation, planning, coordination,

collaboration, monitoring and the evaluation of programmes for the water sector. The Water Directorate of the MWRWH was set up in 2004 to serve as the focal point for coordination of the water and water-related sectors for policy harmonization. Under the auspices of the Water Directorate, the National Water Policy, which covers water resources management, urban water supply and rural water supply, was developed in 2007 (Ministry of Water Resources, Works and Housing, 2007). It aims at the conservation of the nation's water resources through efficient management and sustainable utilization, to ensure that the socio-economic development of Ghana is not constrained at any time by limited or poor-quality water resources (MWRWH, 2007).

The WRC and the river-basin boards serve as platforms for effective coordination of water resources management actions at the national and local levels, respectively. Collaboration has been improved, mainly through support to the data-management institutions of the WRI, HSD and GMet to enhance their capacity for the improvement of data-collection networks and techniques. Between 2004 and 2011, the WRC and the data-management institutions have marked their collaboration through the institution of "service agreements" for capacity improvement and the continual provision of water resources assessment services (WRC, 2012a; MWRWH, 2011b).

Regulatory activities

In terms of its regulatory functions, the WRC act provides for the grant of water rights as the main instrument to regulate water resources use. Exercising its mandate of making regulations, the WRC has passed two sets: the Water Use Regulations (2001) and the Drilling Licence and Groundwater Development Regulations (2006). The Water Use Regulations set out the procedures for water rights, water permits and water use registration for specified water uses, including domestic, commercial, industrial, agricultural, power generation, fisheries (aquaculture), recreational, and underwater wood harvesting. Raw water charges are quantified and exemptions also made for which no charges are collected. The raw water charges are retained in a Water Resources Management Account (WRMA) and used to partly defray the cost of water resources management and regulation.

The **Drilling Licence and Groundwater Development Regulations** aim at licensing drilling companies that prospect for and drill water wells, regulating in an environmentally sustainable manner the development of groundwater resources, and gathering information on groundwater resources availability in Ghana and its exploitation for the effective planning and management of groundwater-development activities.

Management of river basins

One of the key principles for ensuring proper management of water resources is to promote decision making and action at the lowest appropriate level. Hence, the strategy has been to devolve water resources management and planning from the river-basin level and encourage the active involvement of local-level institutions by setting up functional river-basin management structures, specifically river-basin boards (RBB).

Accordingly, river-basin offices and corresponding RBBs were established (in 2004, 2005, 2007, 2011 and 2012, respectively) for the Densu, White Volta, Ankobra, Pra, and Tano Basins as part of devolving water resources management to the local level. These basin boards are composed of local government, water users, NGOs, traditional authorities and other relevant bodies, and each basin board reflects the uniqueness of its basin.

The RBBs work to ensure and promote water resources management, coordination and collaboration, and planning, at the local level. Hence, the key tool for each RBB is the IWRM plan developed for that basin. These river-basin IWRM plans serve as “blueprints” with prioritized actions and measures towards the more local (community-based) initiatives to address the prioritized problems specific to each basin, for example catchment degradation trends, viz. encroachment, deforestation, and pollution (WRC, 2012a; MWRWH, 2011b).

The river-basin IWRM plans for the Densu, White Volta and Ankobra Basins are at various stages of implementation. Some actions that are similar for all the basins, such as public awareness and education, are being undertaken within the WRC’s annual work plans. However, certain actions have been developed and implemented as projects to address specific challenges in each of the basins.

For example, the Project for Improving Water Governance (PAGEV) was implemented from 2004 to 2011 to promote trans-boundary coordination and cooperation in the management of the White Volta Basin. PAGEV recorded significant results, including the establishment of functional committees for the protection of the riverbanks in 13 communities; establishment of a local trans-border stakeholders’ forum; and reforestation of selected riverbanks with fruit trees and woodlots as alternatives for income generation and fuel wood.

Another example is the Urban Catchment Management Project, which was implemented from 2006–2009 to support the Densu RBB in managing the Weija Catchment of the Densu Basin to reduce land degradation and pollution of the Weija Reservoir. The project provided sanitation facilities to beneficiary households and the Ga West Municipal Assembly, and carried out capacity-building initiatives for decision makers and water users.

The adoption of the basin approach to IWRM in Ghana is a practical expression of the “bottom-up” approach. Most countries have followed the conventional process of developing national IWRM plans, without the local ownership, corresponding coordinating institutions, technical expertise, or financial resources to successfully follow through with implementation, especially at the local level. Burkina Faso launched its national IWRM plan in 1999 without an action plan or institutional structures at the basin level for implementation (Spooner, 2011).

The advantage of Ghana’s approach is that there is a clear departure from the usual “top-down” strategy in planning and development, i.e. national plans. The establishment of basin management institutions, followed by the basin plans, has provided opportunities for local stakeholder participation and ownership, thereby enhancing local acceptance and involvement in basin activities. Furthermore, river basins generally have different and distinct problems and challenges. Thus, river-basin plans, in addressing such specific issues, are less grandiose and cumbersome, and easier to finance and manage.

Capacity building, information and education

Water-sector institutions have been provided training in specialized areas of water resources management. For instance, the WRC, WRI, HSD and GMet have benefitted from systematic capacity and training in IWRM. Targeted training in IWRM has also been organized for local government institutions, i.e. district assemblies and NGOs such as Care International and its partners, World Vision, and Water Aid Ghana and its partners.

Since 2004, the WRC has developed and is implementing a public awareness and education campaign, with different components appropriate for the segments of the public

to be addressed. Specifically, public awareness of the proper use and management of water resources has been propagated through a network of major stakeholders, including district assemblies, NGOs, and traditional self-help organizations. Particular emphasis has been placed on the use of public participatory mechanisms, including enhancement of the role of members of disadvantaged groups, youth, farmers and local communities, with a special focus on women.

The public awareness creation and promotion initiatives undertaken thus far have highlighted the need for a communication strategy and implementation plan to guide the efforts on how to most efficiently and professionally carry forward with the ongoing interventions. In response, a communication strategy has been designed to cover the period 2012–2016 (WRC, 2012a).

Trans-boundary water-management initiatives

Ghana is a riparian state that shares a number of basins with neighbouring countries. At least 70% of the water resources of the country is internationally shared: the Volta River basin is shared with Cote d'Ivoire, Burkina Faso, Togo, Benin and Mali; the Bia is shared with Cote d'Ivoire; and the lower reaches of the Tano River form part of the boundary with Cote d'Ivoire. In addition, Ghana is a signatory to a number of international laws, protocols, agreements and declarations and is pursuing others that place obligations on the government with respect to the management of water resources and the environment (MWRWH, 2007).

In that direction, the WRC acts as the national focal institution on trans-boundary cooperation, with a focus on facilitating dialogue(s) towards establishing permanent mechanisms and coordination of trans-boundary water issues and international cooperation. Recently accomplished tasks and ongoing initiatives on trans-boundary cooperation include:

- establishment and functioning of the Ghana–Burkina Faso Joint Technical Committee on Integrated Water Resources Management to advise the ministers of the two countries in charge of water on bilateral water resources management matters
- facilitating the formal establishment of the Volta Basin Authority in 2009 to ensure international management of the water resources of the Volta basin and for socio-economic integration among the six riparian countries
- initiating the Project for Improving Water Governance in the Volta Basin (2004–2011) between Ghana and Burkina Faso for improvement of information, knowledge base and management; restoration of riverbanks; alternative livelihood enhancement through capacity building; and the promotion of local-level trans-boundary institutional cooperation
- engaging with the ECOWAS Water Resources Coordination Centre to promote, coordinate, and implement IWRM in West Africa in compliance with ECOWAS's mission and policies, including the adoption of a West Africa Water Resources Policy (ECOWAS, 2009); the strategic coordination and monitoring of IWRM in West Africa; and supporting the establishment of three new trans-boundary organizations within the sub-region (Adjei et al., 2008; WRC, 2012a).

The above trans-boundary water management initiatives between Ghana and Burkina Faso have experienced some challenges, which are mainly occasioned by socio-political and financial differences. The total area of the Volta Basin (398,390 km²) is shared among

six riparian countries. Burkina Faso and Ghana share 84.5% (42.9% and 41.6%, respectively) of the total area, and in spite of the existence of agreements between the two countries they tend to work in isolation. For example, Burkina Faso, the upstream country, has constructed several large and medium dams on the Volta and its tributaries, and the annual spillage from the major Bagri Dam results in flooding downstream in Ghana. The basic socio-political differences between Francophone Burkina Faso and Anglophone Ghana also inhibit awareness creation and information dissemination on trans-boundary programmes, since every document has to be translated into two languages. These challenges affect the implementation of IWRM at the trans-boundary basin level.

Performance evaluation of the legislative and institutional framework

An evaluation of the performance of the legislative and institutional framework that has evolved since the 1990s shows that some modest successes have been achieved in the process for effective water governance in Ghana. Similarly, the process has faced various challenges, from which some lessons have been learnt.

Developing appropriate legislative instruments and enforcement

An appropriate legislative framework and accompanying management instruments have been clearly set for the water resources sector. However, after over a decade of considerable operations, one major factor limiting sustained water resources management is the poor record of compliance with and enforcement of regulations in Ghana. The enforcement of statutory and customary rules at the basin and local levels is generally weak, which necessitates building up the required capacity to ensure total compliance and enforcement (WRC, 2012a).

An acceleration of the decentralization process at the basin level and collaboration with relevant institutions, particularly the district assemblies and traditional authorities, have been identified as ways through which monitoring for non-compliance could be improved.

Institutional coordination and collaboration

One key achievement is the establishment of an appropriate institutional framework to coordinate and facilitate the implementation of IWRM to resolve the hitherto inefficient governance of water in the country. The decision to establish the WRC as an umbrella institution has gradually emerged as an appropriate step towards an integrated and coordinated approach to the management of water resources.

The mix of representatives on the commission is also significant. However, institutions with previous mandates that have to be ceded sometimes do not seem to be very cooperative. An appreciable mode of collaboration has been developed between the WRC and its related technical data and service providers, though more needs to be done. It is also proposed that further to the existing memorandum of understanding, the WRC should prepare waste-discharge regulations in collaboration with the EPA.

Sustained funding of institutions for water resources management

The provision of sustained financing, particularly local funding and logistics, to support activities could improve the functioning of institutions in the water resources management sector. So far, financial provision for water governance has been largely dependent on

external funding, though the government's support of and financial inputs to the process should be acknowledged. An intervention to address this issue has been the establishment of the WRMA to improve the financial and organizational sustainability of the WRC in securing services and supporting water-management activities.

However, it is important to recommend an increase in the contribution of government funding, which stands at about 19% of the total funding for water resources management, while vigorously pursuing measures to increase funding to the WRMA. It is pertinent to note that external funding sources, once contributed about 85%, have gradually dwindled to 60% of the financial needs for the management of water resources (MWRWH, 2011b).

Institutional framework at the basin level

A major set-back was initially encountered in relation to the pace and "drive" towards establishing and operationalizing the river-basin boards, especially in the premier case of the Densu Basin. A considerable amount of time was spent on issues related to the formal institutional and legal setting, such as "mode of operation" and "constitution".

The experience gained from the pilot activities in the Densu River basin also pointed to the fact that there is no single prescribed approach to establishing institutional structures that will work in all cases. Thus, it is preferable that a collaborative institutional framework evolve through an iterative process rather than being "prescribed" and developed all at once. Accordingly, the approaches to the implementation of IWRM in the subsequent basins were significantly different, based on the lessons from the pilot Densu Basin.

Institutional development and capacity building

Institutional development and capacity building, in terms of skills and capabilities, have improved markedly, at least within the WRC and the data and information-generation institutions. However, it is not the same for the lowest level of decision making, i.e. the district assemblies, where the capacity for effective participation in the management of water resources is limited for a number of reasons.

The "capacity gaps" are financial, with no funds to ensure effective operation and maintenance of systems, or technical, with no skilled staff or appropriate procedures in place. Furthermore, it has not been easy to retain trained personnel in the district assemblies due to frequent transfers; but this is beyond the control of the current legal and institutional framework of the water sector.

Timing

An important lesson that has emerged is that establishing institutional structures for the management of water resources takes a longer time frame than originally envisaged. Most of the issues that have been discussed initially hindered the smooth functioning of the newly established WRC charged with ensuring the effective management of water in the country. The process of coordination and collaboration therefore needs to be approached with patience, zeal and tact.

Conclusion

The management of Ghana's water resources has evolved from the traditional level to the national level, where it is now mainstreamed into the national development planning

system. Traditional management systems are losing their impact due to the gradual but persistent decay of traditional value systems throughout the country. The importance of water in the general development process is increasingly appreciated at the local and national levels in Ghana, and national activities attest to this. In particular, the significant achievement by the institutional reform process in particular is the decentralization of management systems, which enables local-level participation in decision making and actions in the water sector. The introduction of the IWRM concept into the national water resources management system is expected to significantly improve the “all hands on deck” approach that would increase the efficiency required in the management of the country’s water resources.

However, a major concern, yet to be addressed, is the high level of dependence of the entire management-reform process on external support in the form of loans and grants. This is a major risk factor, which, although common to the entire Ghanaian economy, needs to be seriously reversed to ensure the sustainability of the activities within the reform process. The WRMA within the WRC, for example, if properly structured and managed, should constitute a viable source to which financial resources could be harnessed to manage water resources in Ghana. Continued political commitment is required to achieve the goals set up by the legislative and institutional reforms.

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