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How is Integrated Water Resources Management Working at the Local Level? Perspectives from the Black Volta Basin of the Lawra District, Ghana

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Abstract
In recent years, freshwater resources are under intense pressure to satisfy the needs of water users and it has become increasingly clear that the water problems of an area can no longer be resolved exclusively by the water professionals, and/or the water management institutions, alone. Current thinking is that integrated water resources management (IWRM) will solve the water problems. This paper examines the IWRM process in Ghana with a focus on how different institutions and users view the approach and the extent to which actors in the process interact using the Black Volta Basin (BVB) in the Lawra District of Ghana. Data for the study was collected through focus group discussions and in-depth interviews after a community institutional resource mapping approach has been used to identify stakeholders in the IWRM process. The findings reveal a complex web of interactions and networking that occur between and among different institutions and actors. Whereas there is strong interaction and networking among traditional leaders and also between external actors and local structures as well as that of resources owners and water users, that of existing interactions and networks between the traditional authority structure, the external agents and resource owners was found to be weak. The paper concludes that IWRM implementation in the basin has been constrained by the lack of a consistent understanding of the process and differences in real-life political and social, factors and recommends that planning for IWRM should not be done in isolation from practical differences at the local level.
Keywords: Efficiency, Institutions, Integration, Management, Water Resources

1. Introduction

Water is an essential resource that is of direct interest to people living everywhere. It is one of the many important resources with very pervasive interests for assuring good quality life of people across the globe. This widespread interest in water resources regarding its availability, quality and uses makes management of water a central issue in the socio-politico-economic development of communities, districts, regions and nations at large. At present, many countries in the world in their struggle for economic and social development are facing challenges related to water resources. Increasing demands in water, deterioration of water quality and quantity and mismanagement of natural resources in general make water an even vulnerable and finite resource (Scoullos et al., 2002). Globally, many places are experiencing water crisis, which is attributable to a governance challenge especially with regards to the existence of fragmented institutions and physical water structures which together account for a policy of over exploitation (Fischhendler, 2007).

Generally water problems vary across both location and time. The solutions to water problems depend not only on its availability, but also on many other factors. Notable amongst these are the processes through which water is managed, competence and capacities of the institutions that manage them, prevailing socio-political conditions that dictate water planning, development and management processes and practices, appropriateness and implementation statuses of the existing legal frameworks, availability of investment funds, social and environmental conditions of the countries concerned, levels of available and usable technology, different perceptions at the community, district, regional, national and international levels, modes of governance including issues like political interferences, transparency, corruption, educational and developmental conditions, and status, quality and relevance of research that are being conducted on the national, sub-national and local water problems (Biswas, 2008; Molobela and Sinha, 2011; Stefan, 2011) .

The issue of water management has evolved over the years by responding to the particular needs of different sectors rather than balancing their overall needs. This sector oriented strategy has resulted in vertically divided functions in water use and management which culminates into poor coordination and ineffective water management in most cases (Scoullos et al., 2002). The search for solutions to the problems of water has transcended into different approaches being adopted one after the other, particularly in an era when increasing demands for water has brought about a shift in the perception of water as a gift of nature to an economic good.

Since the Mar del Plata conference in 1977, Integrated Water Resources Management (IWRM) has been advocated widely as the most sustainable means to incorporate the multiple competing and conflicting uses of water resources.

The Global Water Partnership (GWP, 2000) defines IWRM as a process that promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems. It involves the adoption of a comprehensive policy framework and the treatment of water as an economic good, combined with decentralized management and delivery structures, greater reliance on pricing, and fuller participation by stakeholders (World Bank, 1993). The GWP emphasises that water should be managed in a basin-wide context under the principles of good governance and public participation (Rahman and Varis, 2005). Scoullos et al. (2002) asserts that while the need for an integrated approach of water management is widely acknowledged, there are a wide range of definitions and implementation approaches emerging out of both theoretical and practical interpretation of the concept. From a more practical standpoint, IWRM is a set of management tools that recognizes the greater interrelatedness of resources and their uses with each other and within a total system. Thus, it offers opportunities for national, regional and district level institutions to adapt their practices to their special realities through consultative and collaborative processes which can then be linked globally.

Although there are numerous operational definitions of the concept of IWRM in scholarly literature, the discourses on how to achieve integration have become polarised along different theoretical paradigms rather than offering constructive alternatives to achieving overall desired results and benefits (Biswas, 2004; Saravanan et al., 2009; Stålnacke and Gooch, 2010). Biswas (2004), for example, contends that the definition of IWRM continues to be amorphous, and there is no agreement on fundamental issues like what aspects should be integrated, how it should be done, by whom, or even if such integration in a wider sense is possible. Thus, IWRM lacks clear methodologies (Stålnacke and Gooch, 2010) for pursuing an agenda of integration. Despite this confusion, a number of views are still concurring that the integrated approach to water resources management is the most remarkable of the approaches to managing this vital resource (Georgakakos, 2004; Dungumaro et al., 2003).

A number of practitioners perceive the IWRM approach as a promising one to achieving successful and sustainable water resources management. The IWRM approach is viewed as a balancing process that provides for an ensemble of means, tools and methods for the development and management of water and other related resources with the objective of attaining water security and sustainability. But the extent of the success depends on numerous factors such as the nature and extent of emerging conflicts and how they are resolved and also upon the interactions between water resource users and other stakeholders (Dungumaro et al., 2003). According to Scoullos et al. (2002), the four 'water principles' in the IWRM framework are:

i. Freshwater is a finite and vulnerable resource, essential to sustain life, development and the environment;
ii. Water development and management should be based on a participatory approach, involving users, planners and policy-makers;
iii. Women play a central role in the provision, management and safeguarding of water; and
iv. Water has an economic value in all its competing uses and should be recognised as an economic good.

Hence, the role of actors in the management process within institutions and how they view the IWRM approach relative to other players in the water sector becomes crucial. Georgakakos (2004) asserts, for instance, that lack of effective decision support systems that bring together the necessary disciplines, people, and institutions that can address the existing bottlenecks and enhance sustainability of water resources is one problem confronting the IWRM approach. He contends that, by its nature, the IWRM is a process where information, technology, natural processes, water uses, societal preferences, institutions, and policy actors are subject to gradual or rapid change. Changes may come with new institutions but no matter how changes occur, one primary function of institutions is to drive the process of change through building appropriate partnerships. Some challenges in IWRM include: the segmentation of institutions responsible for water resources planning and management; limited participation of stakeholders in decision making processes; and the lack of disinterested self-assessment and improvement mechanisms, both within and outside communities (Georgakakos, 2004). IWRM principles often involve including all sources of water in planning; addressing water quantity, water quality and ecosystem needs; incorporating principles of equity, efficiency, and public participation in water planning; and sharing information across disciplines and agencies (GWP Technical Committee, 2005; United States Army Corps of Engineers [USACE], 2010).

Generally, water management has evolved over the years by responding to the particular needs of each sector rather than by balancing overall needs. The result has been vertically divided functions in water use and management, which has made water management rather inefficient in most cases (Scoullos et al., 2002). In Ghana, many reforms have taken place in the water sector but there still remain numerous challenges to contend

with in terms of water availability and quality. There has also been a drift from a top-down to a bottom-up approach to addressing the problems of the water sector. This switch in the approach adapted has since witnessed the emergences of water user associations and different management systems and structures at the community, district, regional and national levels. In the view of Scoullos et al. (2002), the IWRM approach challenges existing orientations, institutional arrangements and the objectives and character of sectoral policies. Thus, the understanding by the people and institutions of the need for change and also the way in which change will take place is a prerequisite. This paper examines the IWRM process in Ghana by focusing on how different water users and management institutions view the IWRM approach and the extent to which the actors in the process interact in a bid to apply it using the Black Volta Basin (BVB) in the Lawra District of the Upper West Region.

2. Overview of the IWRM Process in Ghana

Attempts to implement IWRM in Ghana began in the late 1980s and early 1990s, through a number of regulatory reviews, which enabled the government to undertake a number of reforms, notably:

i. a rural water and sanitation strategy based on community ownership and management;
ii. the restructuring of the urban water sector to bring in private sector participation in urban water delivery;
iii. preparation of the national environmental action plan; and
iv. strengthening of water resources information agencies.

These reviews were followed by various actions taken to bring about radical changes in the water sector. For example, in the rural water delivery subsector, the Community Water and Sanitation Agency (CWSA) became established with the mandate to act as a facilitator for the delivery of water and sanitation facilities and hygiene education to communities, and to oversee the accelerated provision of potable water and hygienic sanitation facilities in a congenial environment. Prior to these attempts, water policies implementations were sector-specific. Each sector agency managed, controlled and regulated its own activities with respect to water management, with little coordination and control. For instance, the Ghana Water and Sewerage Corporation (GWSC), now the Ghana Water Company Limited (GWCL), developed, managed and controlled drinking-water supply and, to a very limited extent, sewerage services; the Volta River Authority used fresh water to produce electricity; the Irrigation Development Authority (IDA) developed and managed irrigation and associated land use for agricultural production; and the Environmental Protection Agency (EPA) concerned itself primarily with the environmental implications of water treatment and usage.

A major milestone event towards reforming water resources management was the Water Resources Management (WARM) study that was initiated in 1996 and carried out through consultative workshops with the participation of a broad spectrum of stakeholders in both the public and private sectors, women representatives, researchers, media personnel and the general public. This culminated in the establishment of The Water Resources Commission (WRC) 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 in relation to them. Since its establishment, the WRC has developed short-and-medium-term strategies for the management of water resources in the country. As part of these strategies, the Densu basin in the south and the White Volta basin in the north have been selected for pilot studies. The main components of the pilot interventions include institutional development and capacity building, coordination of the water sector at the river basin level, participation of stakeholders, regulation of water use, allocation of water resources, and management of inter-boundary water resources (Odame-Ababio, 2003). The aim is to explore ways to institutionalize the Commission's functions and to appropriately use the decentralized local government structures, notably, the Regional, Metropolitan, Municipal and District Assemblies to pursue the agenda of IWRM.

3. Study Area and Methodology

3.1 The Black Volta Basin (BVB)

The Black Volta is one of the main waterways of the Volta Basin which is shared by Mali, Cote D'Ivoire, Burkina Faso, Ghana, Togo and Benin. The total area covered by the Volta Basin is 414,000 km^2 but over 80% of this area is located in Burkina Faso and Ghana (Figure 1). The Black Volta takes its source from the north-western areas of Burkina Faso and empties its water into the Volta Lake in Ghana. It constitutes Ghana's north-western boundary lines with Burkina Faso and Cote D'Ivoire. The BVB describes the area within the Volta Basin which is drained by the Black Volta River.

Figure 1. The Black Volta Basin
Source: Water Resource Commission of Ghana, 2013.

In terms of political administrative set-up, districts whose landmasses are drained by the BVB are Nandom, Lawra, Nadowli and Wa West, all in the Upper West Region of Ghana. These districts derive their main water resources from the BVB. Other sources of water within the basin are rainfall, tributaries of the Black Volta, hand dug wells, dugouts, boreholes and small-town water systems (STWS). Water from these sources is used to meet various uses, thereby drawing together a whole myriad of individuals, households, communities, institutions and oragnisations and other stakeholders on a common platform of the basin's development.

Broadly, the Volta Basin is described as one of the poorest watershed areas in Africa (Harrington et al., 2006) with an estimated average annual income of about US$800 (Asare, 2004). With few other natural resources available, rain-fed and some irrigated agriculture is the principal basis of development for the people of the entire basin. In addition to these, other livelihood activities, especially within the BVB of Lawra District, include agro-processing, rearing of livestock, food vending, harvesting and selling of fuel wood and charcoal, trading in or healing with herbal extracts, retail businesses, etc. Population growth rates per annum are at almost 3%, placing increased pressure on land, water and other natural resources.

3.2 Materials and Methods

The study focused on four selected communities within the basin in the Lawra District, namely, Orbili, Berwon, Naburnye and Babile. These communities were purposively chosen to reflect the diversity of water sources in the basin and also to account for variations in water management systems across rural and urban communities. In the case of Orbili and Berwon, there are two but distinct tributary streams of the Black Volta which pass through them. These communities were, therefore, chosen in order to identify the kind of management systems in place and to understand how different users access and utilize the water sources with the view to recognising the needs of other (down-stream) users. Naburnye was selected to study mainly issues on the dug-out (dam) in the community and how they relate broadly to the other water resources management within the community. Babile, an urban settlement in character, was selected because of the presence of a small-town water system (STWS), its

proximity to the Black Volta and also the very diverse nature of water users in the community.

In each of the selected communities, the study employed qualitative methods of inquiry to collect primary data. A community institutional resource mapping (CIRM) approach (Guri at al., 2005) was used to map out generally, all formal and informal institutions that exist in the study communities, including their various roles in water and other resources management. This method helped to expose the relevant institutions and their functional relationship, as well as the available natural resources that exist in the communities. The different sources of water and their related user groups (or potential user groups) as well as the management groups were also identified through this process. . Focus group discussions (FGDs) were then conducted with the different user groups on how they perceive the IWRM framework; their roles and responsibilities. Additionally, in-depth interviews were held with community-based structures and formal institutions (both within and without communities) that are responsible for the development/management of water resources or water systems. The entire methodology brought together the views of user groups, and management institutions at all the different levels of the water management frame. The outcomes of these interactions form the basis of the discussions on the findings of this paper.

4. Discussion of Results

The study identified the different sources of water, water users (or user groups) and the management systems in place in each of the communities. This section outlines the different sources of water and user groups, and examines the different perspectives of each user group(s) and/or the management institutions in place.

4.1 Sources of Water and their Related Water Users

The main sources of water identified throughout the study communities are rainfall, ponds, wells, rivers, dug-outs or dams, boreholes and pipe borne. These sources, in combination, serve a diversity of water uses which are broadly categorized as domestic, agricultural and industrial uses. The most common domestic sources for all household uses in the area are wells, boreholes and pipe borne. Agriculture is largely rain fed but during the dry season ponds, wells, rivers and dug-outs or dams serve as important sources of water for activities such as livestock rearing and dry season gardening (mainly the cultivation of vegetables). In the case of industrial related activities, the source of water relied upon normally vary according to the type of product the industry produces for the market and whether the goods are consumable or not. Agro-processing such as *"pito"* (a local beer) brewing, Shea butter and *"dawadawa"* (a local spice) processing as well as activities of food vendors normally rely on wells, boreholes and pipe borne. The main sources of water and the different users of water in the four communities are outlined in Table 1 below in line with the three broad categories uses and users.

Table 1. Distribution of Water Source by Category of Use and Users in the Community

Community	Main Sources of Waster	Category of Water Use	Types of Users Present
Orbili	Rain and Boreholes	Domestic	Women, Men, Children
	Rain, the Black Volta and tributary streams	Agriculture	Non-irrigated farmers; livestock owners; agro-processors; gardeners
	Rain, Boreholes, the Black Volta and tributary streams	Industry	agro-processors; gardeners; local crafters
Naburnye	Rain, Boreholes, Wells, rivers, and dam	Domestic	Women, Men, Children
	Rain, rivers, and dam	Agriculture	Non-irrigated farmers; livestock owners; gardeners
	Rain, Boreholes, Wells, rivers, and dam	Industry	agro-processors; local crafters
Berwon	Rain, Rivers/streams, well, and boreholes	Domestic	Women, Men, Children
		Agriculture	Non-irrigated farmers; livestock owners; gardeners
		Industry	agro-processors; local crafters
Babile	Small-Town Water System, Boreholes, wells, dug-out, and Rain	Domestic	Women, Men, Children
		Agriculture	Non-irrigated farmers; livestock owners; gardeners
		Industry	agro-processors; local crafters

Table 1 illustrates the multiple user groups of water resources in the basin. However, the degree of the diverse nature of water users varies across rural communities notably Orbili, Naburnye and Berwon is

remarkably distinct from that of Babile, which is an urban area. The different user groups of water, as indicated, are not just limited to a particular use but cut across various other uses. It was also found that the users of a particular water resource are not necessarily the owners of that resource and in, some cases, ownership was being contested. A clear distinction between a user or user group and a resource owner or owning group and influences therein was found to have good repercussions for the management of the different water (re)sources in the basin. The responses showed that the guidelines for integration were in conflict with the expectations of local people as well as that of the power of the local or traditional authorities to effectively implement and monitor issues of water use, availability, and quality.

4.2 Institutional Arrangements for Water Resources Management

There is a multi-layered institutional arrangement for managing water resources in the BVB. This comprises of a blend of interactions between actors from both formal and informal (or traditional) structures. Broadly, the actors in the IWRM process can be categorized into those operating within structures in the community as well as those from outside the community. At the community level both formal and informal institutions co-exist to address issues concerning water. Formal structures that operate in the communities to manage water include Water and Sanitation Committees (WATSANs), Water Users Association (WUAs), locally elected representatives of the local government system, such as Assembly Men/Women and Unit Committee Members, as well as other identifiable groups that are formed mostly by external water related agents working in the communities to promote issues of water that are of interest to them. There are also the traditional 'informal' institutions headed by Chiefs and the Tengandem (Earth Priests). Generally, all issues of community development including water revolve around Chiefs and Tengandem since they act as administrative heads and custodians of communities respectively and also superintend over issues of natural resources. In each community, the Chief and Tengansob oversee all matters regarding the management of all common property or resources, including rivers or streams. In terms of water management, Chiefs and their Council of Elders as well as the Tengandem collaborate with the locally established structures to allocate sites for constructing water facilities especially in the case of boreholes and dug-out or dams, formulate and enforce byelaws regarding water use and also arbitrate in disputes both within and outside the water sector.

External actors are mainly government agencies/departments such as the District Assembly, the District Water and Sanitation Team (DWST), Ministry of Food and Agriculture (MoFA), Community Water and Sanitation Agency (CWSA) on the one hand and non-governmental organisations (NGOs) on the other hand. These actors collaborate in diverse ways to ensure and enhance water availability and quality for various uses within the communities in the district. The nature of the different collaborations between different institutions in the BVD is depicted in Figure 2 below.

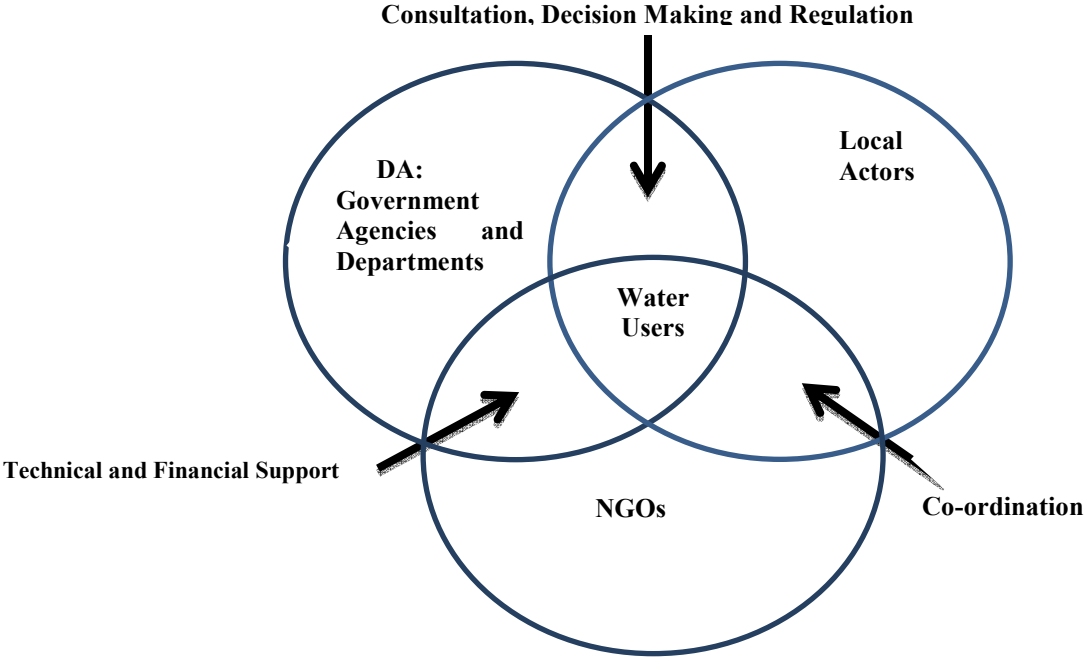

Figure 2. Collaborations of Actors in the IWRM Process

From the Venn diagram, the DA together with other decentralized government agencies and departments mostly collaborate through consultative processes in the formulation of decisions and rules/regulations on water resources. Similarly, the decentralized bodies work together with NGOs to provide

both technical and financial assistance to enhance community water resources and water uses. NGOs also collaborate with actors and water related structures at the community level in order to enhance coordination of water sector issues both within the community and the district at large. The outcomes of information gathered through coordination provide useful feedbacks for further consultation and support.

At the Apex of all water resources management, especially within the formal sector, is the District Assembly (DA). The Lawra DA has oversight responsibility over all natural resources (NRs) within the area. As a result management of available NRs, including water, is always a priority of the DA. The management responsibilities are a collaborative effort between the DA and communities in the district. In terms of water management, the office of the District Water and Sanitation Team (DWST) within the DA is directly responsible for all potable water points with support from other decentralized institutions such as the District Health Management Team (DHMT), Ministry of Food and Agriculture (MoFA) and the Ghana Education Service (GES) among others. Other institutions that contribute to this effort in the district are NGOs, such as Global Water Initiative (GWI) and Community Water Project (COWAP), and the Community Water and Sanitation Agency (CWSA), which is also the overall supervisory body at the regional level. At the community level, the water points, especially for boreholes, pipe borne, and dams or dug-outs are managed by established committees, notably, the WATSANs and WUAs who are also commonly referred to as dam management committees and recognized vendors in the case of the pipes under the STWS in Babile.

The interest of all actors in the water sector in the district is to ensure and enhance water availability (including water quality) and sustainability of all water uses. Thus, the primary objective in the collaboration process is to meet the various demands for water and satisfy the needs of the different water users throughout the communities. As shown in Figure 1 above, there are several forms and levels of interactions and networking amongst the various actors/stakeholders identified above. Broadly, however, these interactions/networks may be said to be occurring at three different levels, namely:

i. Interactions within the community, i.e., amongst actors within the community;
ii. Interactions between internal actors and external actors; and
iii. Interactions amongst external actors.

The Chief consults the Tengansob (or Tindana) in terms of decision making concerning natural resources. He entrusts the management of resources with the Tengansob (or Tindana) and various lineage heads who are the owners of natural (land) resources. The Chief cannot dictate to them what should be done. However, if there is a problem which the Tengansob/ Tindana thinks of the chief as being useful in discussing together with his elders he consults the chief. Though the quality of such interactions is usually good, they rarely occur. The chief in making his decisions is answerable to the land owners and the Tengansob /Tindana. If land is required for a project he reports to the lineage head on whose land the project is to be sited and the lineage head in turn informs the Tengansob/Tindana. The chief can report to the Tengansob/Tindana if an offender of a rule brought before him is deemed to have sinned against the earth god and appropriate cleansing rituals need to be offered.

Internally, the chief also interacts with assembly men/women, unit committee members, WATSANs and other community-based associations, such as WUA and Youth Development Association (YDA) on development issues, especially in relation to water resources. This kind of interaction usually has the aim of informing the chief of incoming projects and the need to mobilize resources (land and man power) for project implementation. Such interactions take place only when there is the need for a project to be implemented or when an existing facility needs repair. The quality of this kind of interaction was generally assessed to be good.

The chief also interacts with district assemblies and officials of MoFA and other external actors on irregular bases. This is an average interaction mainly to inform the chief of project activities (e.g., construction of school blocks and drilling of boreholes) it does not involve much of natural resource management.

The Tengansob/Tindana interacts with only other internal actors. His network is limited to the chief, land owners, local development associations and resource users. The Tengansob/Tindana interacts with land owners and resource users in terms of settling disputes over land ownership. Also, land owners' lands cannot admit strangers into the community without the approval of the Tengansob/Tindana. For development agencies, it is the Tengansob/Tindana who is called upon to offer sacrifices to the ancestors before the commencement of any project.

There have been interactions between communities and the district assemblies through the various members of the assembly in areas of social service provision including water. The district assemblies do not involve the resource users in project identification, design and implementation. Similarly, the assemblies do not frequently interact with the unit committees. In an interview with the unit committee of Babile, a member observed that:

> *"the only time the Unit Committee interacts with political leadership of the district assembly is when election is drawing closer".*

However, the assembly member does brief them about the issues concerning the district's development agenda after every assembly session. The assemblies' interactions with community members are unstructured in that they occur only when the district assemblies have projects in the communities.

Interactions do occur between resource user's organizations and government agencies/departments. One of the most common forms of such interaction is between WUAs and IDA and MoFA on dam management. NGOs also interact with communities through various resource user associations and community-based development associations in their areas of operation. For example, the Diocesan Development Organization (DDO) interacts with the community water and sanitation development board (CWSDB) in Orbili, whereas others such as RAAP and ProNet interact with various women groups in many locations of the district. It was noted that interactions between communities and NGOs are good.

Government agencies/departments and NGOs collaborate severally in the performance of their roles in natural resource management. The Ghana Health Service/District Health Management Teams of the health sector collaborate well with the district assemblies, Ghana Education Service, NADMO and other NGOs like World Vision and Care International in immunization campaigns, cleanup exercises and public education. The NGOs also supply them with equipment, such as vehicles, and financial support. NADMO collaborates with planning departments of the district assemblies, Ghana Health service, forestry department, EPA, Fire Service and a lot of other sectors to see to the environmental issues. District assemblies collaborate with EPA, Forestry Commission, NADMO and others in the performance of their duties (see Box 1); in addition, the district assemblies collaborate with the police and military to ensure that bye-laws on natural resources are enforced, particularly regarding illegal mining operations.

Box 1. Collaborations with District Assembly

- *NADMO: Advises the planning unit in the district on how to identify disaster prone areas and to prepare against such disasters.*
- *MoFA: Gives information concerning the agric sector to include it in the medium term development plan.*
- *EPA: Advises DAs on how to factor environmental issues in to the district medium term development plan and liaise with to sensitize the people.*
- *Forestry Commission: Liaise to protect forest resources and enforce by-laws.*
- *NGOs: Provision of equipment, technical and financial support.*

The outcomes of these roles and interactions/networks are several. First, local institutions are weak. Second, there is a general weakness in terms of relationships between internal and external actors. In other words, there are strong interactions amongst internal actors than there is for interactions amongst external actors and between internal and external actors. Surprisingly, interactions between communities and NGOs are stronger than interactions between communities and government agencies/departments.

In Berwon and Orbili it was observed that no major steps are taken by traditional authorities (including the Chief) to enact and enforce bye-laws that will promote sustainable management of natural resources in the community. As a political and administrative head of the community, the influence of the Chief in terms of natural resources management is quite minimal because he neither owns nor controls the entire resources within his jurisdiction. The Chief also has a weak influence over resource owners, especially land owners. The main constrain for the Chief, therefore, is the fact that there is no community wide mechanism to coordinate, control and regulate access and use of natural resources. This makes it difficult for the chief to regulate activities on land in the community.

Furthermore, it appears that the role of the Tengansob/Tindana, though separate, is subservient to those of the Chief, especially in Berwon, where both the Chief and Tengansob belong to the same house (family). It appears that the role of the Tengasob of Naburnye is overshadowed by those of the Chief. It was also noted that the Tengansob of Orbili play a subservient role (more or less a coordinating function) to that of the adjoining communities. The Tengansob of Orbili puts it this way:

> "……..*if anything should happen here, and it is brought to my notice, I have to receive it and take it to the head of family (called Nyanyaasaala), the Tengansob of Kulbognuor, for the necessary rites to be completed. (…) even when it is within my means, I still need to inform him".*

Another weak institution within communities is WATSANs, in terms of capacity and resources. These committees, especially in the Upper West Region, are more or less very dormant and are barely functioning even though they still mobilize to get some of the water facilities they manage repaired. In Babile, for instance, a number of the boreholes were found to be broken down, though there are WATSAN Committees in the community responsible for the management and maintenance of the boreholes. In Naburnye, however, it was

realized that two of the committees have been serving for about 20 or more years and seem to be suffering from duty or responsibility fatigue.

The weakest networks across communities seem to be interactions with the district assemblies. However, as already noted, expectations of community members from district assemblies are mainly about development projects, such as school buildings, electricity and boreholes, and not about land, water and other natural resource management. In Berwon, Orbili and Naburnye the elders observed that the district assembly is not responsive to their needs and that they are not sure whether the assembly does not have the wherewithal or that it is just not interested in their welfare or it is because they do not have educated people in the community who can exert pressure on the assembly to respond to their concerns.

4.3 Nature of the Interactions and Networks of Institutions for Water Management

From the discussions the previous sub-section, it is clear that there is a complex web of interactions and networking that occur between and among different institutions and actors engaged in efforts aimed implementing the IWRM process in the district. For purposes of simplicity, the kind of interactions and networks within and across the different structures is illustrated in Figure 3 below.

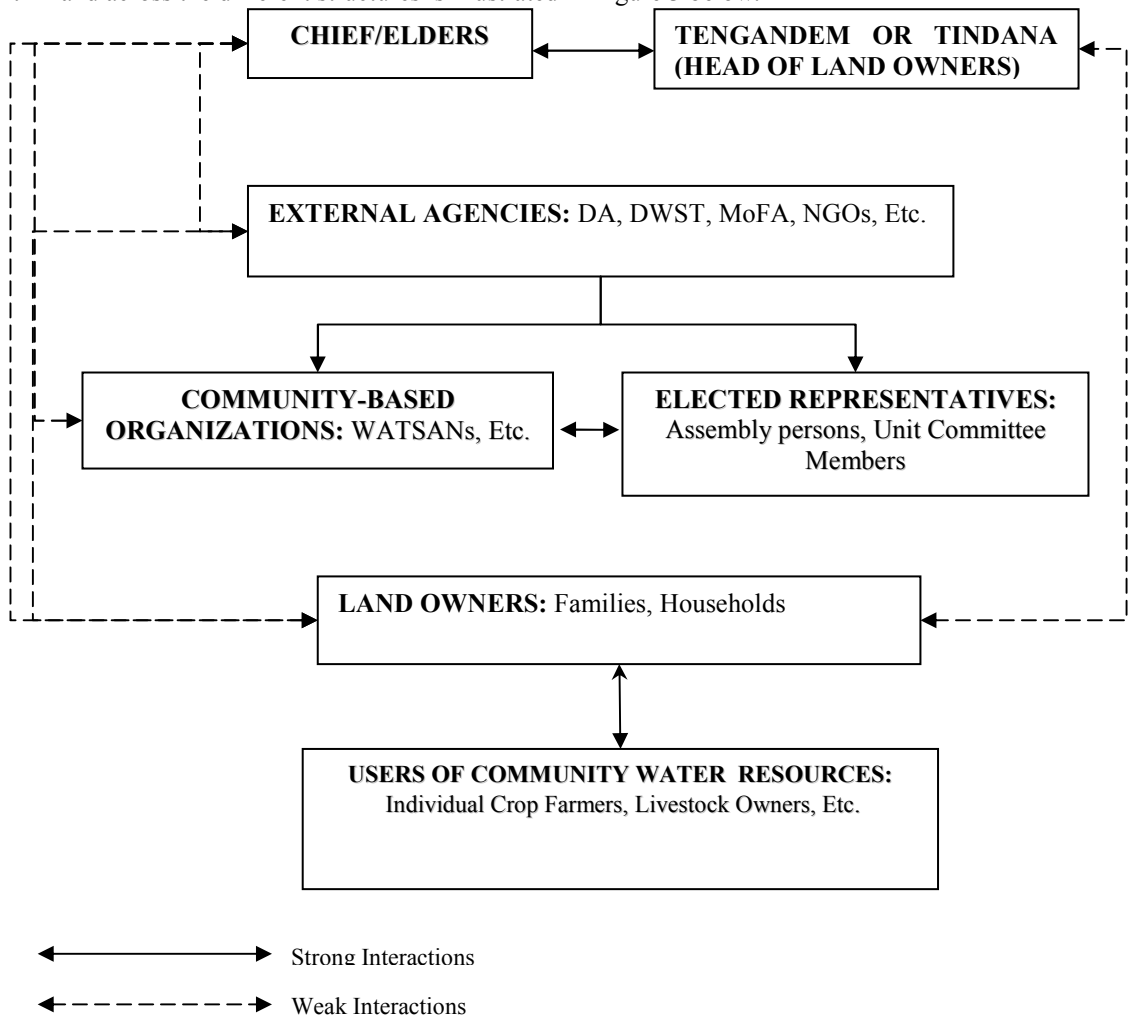

Figure 3. Interactions and Networks of Institutions in the Basin Area

Figure 3 shows that external agents, notably, the DA and decentralized departments/agencies and NGOs together with elected representatives and community-based water management organisations constitute a centre-nerve in the interactive and networking processes that tend to link various water uses and their traditional leadership for effective and efficient delivery of water services to the benefit of community users.

There are several outcomes in the roles and interactions/networks between stakeholders of different institutions in the study area. First, the local institutions are weak. Second, there is a general weakness in terms of relationships between internal and external actors. In other words, there are strong interactions amongst

internal actors than there is for interactions amongst external actors and between internal and external actors. Surprisingly, interactions between communities and NGOs are stronger than interactions between communities and government agencies/departments.

In Berwon and Orbili communities, for example, it was observed that no major steps are taken by traditional authorities (including the Chief) to enact and enforce bye-laws that will promote sustainable management of natural resources in the community. As a political and administrative head of the community, the influence of the Chief in terms of natural resources management is quite minimal because he neither owns nor controls the entire resources within his jurisdiction. The Chief also has a weak influence over resource owners, especially land owners. The main constrain for the Chief, therefore, is the fact that there is no community wide mechanism to coordinate, control and regulate access and use of natural resources. This makes it difficult for the chief to regulate activities on land in the community.

4.4 Understanding the IWRM Process from the Standpoint of Institutions

Effective management and governance of water cannot be achieved if the water managers themselves and all stakeholders dealing with water issues at various levels do not understand and apply the IWRM framework (Scoullos et al., 2002). A poor understanding of the approach can hamper efforts at managing an integration process, especially within the context of the split multi-sectoral and also multifaceted nature of the entire water sector as linked to other (non-water) sectors. However, a critically important element of IWRM is the integration of various sectoral views and interests in the development and implementation of the IWRM framework. The IWRM framework envisages that integration should take place within the natural system, with its critical importance for resource availability and quality, and also the human system, which fundamentally determines the resource use, waste production and pollution of the resource. The human system must also set the development priorities as well as control the associated infrastructure.

Within the natural system, integration concerns, for instance the integration of land and water management, surface and groundwater, upstream and downstream water related interests recognises the full hydrological cycle. On the other hand, integration within the human system relates in particular to cross-sectional integration of policies and strategies and integration of all relevant stakeholders in the decision-making processes. To secure the co-ordination of water management efforts across water related sectors, and throughout the entire water basin, formal mechanisms and means of co-operation and information exchange need to be established. Such co-ordination mechanisms should be created at the highest political level and put in place at all relevant levels of water management. Thus, it is important that the IWRM builds on and provides consistency with current government policies and national or sector development plans and/or budgets. In order to achieve the desired results of the integration process, it is important to understand the links of IWRM with plans and processes at the national and sectoral level and take these into account in the planning process.

From the study, there exist disparities on how the different institutions in the BVB water resources management system perceive the various operational details in both the natural and human systems as outlined above. While some institutions acknowledge the benefits that can be derived through effective integration of different interests, others chastised the process as one of conflicts with and alienates their traditional functions within the intrusion of new superstructures with their accompanying policies that are backed by government. In terms of management of boreholes and the STWS, all stakeholders view the process as one that has enhanced sustainability of the systems for the numerous uses that they serve. Users are particularly concerned with the levels of improved quality and access since efforts at implementing the IWRM in Ghana kicked-off. The issue of cost-sharing between external providers and community water users is also viewed to be beneficial. However, traditional institutions, notably Chiefs, Tengandem and land or farm owners at the community level generally feel threatened that an IWRM process would weaken their authority and autonomy in the way they hitherto controlled and managed all "*God given*" community natural resources including water.

Traditionally, the Chief is the political and administrative head of the community. His general functions and responsibilities regarding natural resource management (including water) are: mediating in disputes; enacting and enforcing community bye-laws especially on water resources; receiving and disseminating information on water resources from the DA, the Paramount Chief and other actors; liaising with community elected representatives (the assembly members, the unit committee members) and other opinion leaders to lobby for water projects; and to ensure peace and security on all issues of development particularly with regards to water and related resources within his jurisdiction. The Chief is generally assisted in these functions by the community elders and the Tengandem or Tindana. The Tengansob or Tindana is mostly the custodian of the 'earth god' and he exercises oversight responsibility over the land and all natural resources (or ancestral property) of the community. As a traditional priest, he is responsible for all spiritual matters regarding land and all common property resources. In pronouncing community bye-laws, it is the Tengansob or Tindana who invokes the spirits of the gods and ancestors to deal with people who break the laws enacted by the community. Within the traditional cosmologies of the indigenous communities within the BVB, all NRs,

including water, are governed by a non-systematized rules, regulations, values and norms which are supervised by informal traditional structures at the community level. In such a system, mechanisms for monitoring and reporting violation regarding the use of resources, such as water, by different groups become open and a shared responsibility. From the focus group discussions with traditional authorities in the area, it was noted that there is a break down in the kind of social protection rules that hitherto served as a guide for managing open water points especially rivers and community dams. This is a result of the intrusion of western ideas from formal institutions which tend to undervalue and undermine the significance of certain norms, taboos, values and traditional practices. Thus, there is a conflict between the roles to be played by the traditional authorities, on the one hand, and the new emerging policies, rules and accompanying structures, on the other hand, at the community level.

One of the nagging challenges confronting an agenda to pursue integration within the IWRM framework is how to ensure harmony between the different uses, both at the upstream and downstream. Communities are defined by territorial boundaries which are controlled by different sets of local authority. In some instances, there exist boundary and resources conflicts which tend to impede efforts to pull together up and down stream uses to effectively participate on a common platform. For instances, there is land dispute between the people of Berwon and Gbier along the boundaries of the Kulkpee stream (a tributary of the Black Volta). The people of Orbili are also in conflict with Kulbognuor village over ownership of a section of the Black Volta running through the district and there are similar disputes on land uses around the dam in Naburnye. These conflicts tend to impact negatively on efforts aimed at integrating both the natural and human systems.

Furthermore, the different institutions operating in the water sector in the BVB tend to comprehend and apply the IWRM framework differently. Policies are not understood in their proper contexts just as legislations become contrived by the nature in which they get enforced. This is further exacerbated by the kind of administrative difficulties that come with the attempts at operationalising the IWRM framework at the community level. Within the context of river basin management, Bruns et al. (2001) have opined that an overall practical institutional framework be considered in three broad categories, namely: ***policy*** (the policies at national, local government and organizational levels); ***legislation*** (the laws which include formal laws, rules and procedures, informal rules, norms and practices, and also internal rules of organizations); and ***administration*** (both at the policy level for resources management and at the implementation level for the delivery of management services). Given this position, the way and manner in which policies and legislation are couched and communicated at the local level could itself pose hindrance to the success of the entire process. This, when added to the bigger administrative challenges, further compounds the issue.

5. Conclusion

Freshwater resources are under increased pressure to satisfy the needs of water users throughout the world. IWRM is designed to replace fragmented management of water and encourage sustainable use. While in recent years there has been growing international and national recognition of the need to manage water using an IWRM approach, implementation has progressed slowly. Implementation has been mired by the lack of a consistent definition and differences in real-life political, social, and physical factors influencing stakeholders. Various issues are feeding into different perceptions of an IWRM approach in the BVB. These include the question of how to achieve integration within the broad institutional framework (i.e. integration for who? And who, should lead and own the process?); the multi-layered nature of resource ownership in the basin; the process of planning for integration as external agents plug-in and plug-out; and also the problem of contested resource ownership particularly on land and parts of the Black Volta River.

IWRM in the BVB is practical and achievable. Planning is an important part of IWRM, but creating tangible impacts comes from putting IWRM principles into action to demonstrate solutions to real problems. To achieve positive impacts, the DA needs to gazette all by-laws for effective enforcement, introduce of rain water harvesting techniques to communities, and built capacity of communities and retrained existing management structures to make them more effective in implementing NRM decisions at the local level. Communities should be sensitized to begin viewing NRM issues as a matter of collective priority and responsibility.

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