

Full Length Research Paper

Policy interventions in watershed management: The case of the Inchaban Watershed, Ghana

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Before the twentieth century, watershed management in most Ghanaian communities relied solely on religious-based restrictions such as the use of taboos and sacred groves, to deter people from encroaching on watersheds. However, the advents of Christianity, western education, and urbanization, and the desire to develop the resources of the country have reduced the effectiveness and respect for traditional restrictions for the protection of the environment. Also, customary administration over watersheds has had a lot of challenges in evaluation and assessment of environmental damages, enforcement of laws to bring illegal land users to book, and integrating the rights of land users with policies on regulation and management. In the face of these numerous problems in the reliance on customary laws and practices, several watershed management policies have been consolidated with other key water sector policies such as the Water Use Regulation LI 1962, the Integrated Water Resource Management Policy (IWRMP) of 1996 and the National Water Vision Policy of 1997 to streamline the administration over local watersheds. Despite these policies, many watersheds are still under the threat of degradation. This study identifies the reasons why the government has become unsuccessful to manage watersheds in the country. It used the Inchaban Watershed as a case, and solicited information using in-depth interviews and focus group discussions from 41 stakeholders or respondents who were selected purposively. The results of the study revealed that capacity of the management institutions to enforce the laws and policies set out by government was challenged due to problems of legal pluralism posed by local chiefs, some management and other institutions as well as individual local users of the Inchaban Watershed.

Key words: Watershed management, management institutions, user institutions, policies, Inchaban Watershed, Ghana.

INTRODUCTION

Watershed is an elevated land that separates the headwater and tributaries of one river, or drainage basin, from those tributaries flowing into another river or drainage

basin (Acheampong, 2009). World Bank (2001) defines watershed as the area that supplies water by surface or subsurface flow to a given drainage system or body of

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water, such as a stream, river, wetland, lake, or the ocean. According to Pradhan (2003), watershed is that area of land within which all living things such as human beings are inextricably linked or connected to a bounded hydrological system. Watersheds are, therefore, part of human communities, and become very important for communities to properly plan their use (Pradhan, 2003). To properly plan for watershed use calls for the establishment of sound management systems.

Darghouth (2008) defines watershed management as the integrated use of land, vegetation and water in a geographically discrete drainage area with the aim of protecting and conserving the watershed resources. According to the Global Water Partnership (2000), watershed management is a process which promotes coordinated development and management of watershed resources in order to maximize economic and social welfare in an equitable manner that sustains vital ecosystems and promote conservation. Watershed management is being supported by governments of developed and developing countries including Ghana for a number of reasons. Among them are the facts that watersheds support supply of food, water and medicinal products; provide habitat for plants and animals, and regulates climate (World Natural Resource Conservation (WNRC), 1996). Manuel (2007) discovered that to meet the objectives of watershed management, there must be supportive institutional arrangements. Ostrom (1999) has subsequently suggested that institutional arrangements for watershed management should consist of organizational roles, established national laws and regulations (policies) that shape structures for human actions in order to prevent future environmental problems.

History of policy interventions in watershed management in Ghana

Before the twentieth century, watershed management in most Ghanaian communities relied solely on religious-based restrictions (Bullock, 2008) and the use of taboos and sacred groves, to deter people from encroaching on watersheds (Opoku-Agyemang, 2008). These restrictions were, to a large extent, dependent on the respect for religious, local and cultural structures for the protection of the environment (Odame, 2010).

Unfortunately, the advents of Christianity, western education, and urbanization, and the desire to develop the resources of the country have reduced the effectiveness and respect for traditional restrictions for the protection of the environment (Opoku-Agyemang, 2008). Moreover, customary administration over watersheds has had numerous challenges in evaluation and assessment of environmental damages, enforcement of laws to bring illegal land users to book, and integrating the rights of land users with policies on regulation and management (Gibson, 2001).

In the face of these numerous problems in the reliance on customary laws and practices, the government of Ghana resorted to the enactment of state laws and policies to strengthen mandates of institutions in charge of managing water resources. The first comprehensive attempt to regulate the use of water resources, other than for industrial production activities, was the enactment of the *Rivers Ordinance Act (CAP 226) of 1903*. Section 10 of this Ordinance states that it shall be unlawful to pump, divert or by any means cause water to flow from any river, for purposes of large scale irrigation, mining or to generate power without a license from the appropriate quarters.

Unfortunately, there was no follow-up to the Rivers Ordinance Act. Consequently the ordinance was overtaken by time and other enactments which contained specific provisions that enabled agencies to perform certain functions, some of which were watershed-related (Bossman, 1998). For example, the *Forestry Ordinance of 1927* made provisions for catchment protection and control of water abstraction in forest reserves. The *Land Planning and Soil Conservation Ordinance of 1953* contained sections for checking soil erosion and the control of watercourses. State laws were very beneficial to some extent since they stressed the need to establish institutions and agencies to support watershed management (Odame, 2010).

The onset of the post-independence era opened the way for the establishment modern policies with specific legal enactments for water supply and drawing of economic products in watersheds. Table 1 shows some relevant watershed management policies and their associated legal enactments. As observed by Opoku-Agyemang et al. (1998), Table 1 demonstrates the attempts made by previous governments to improve watershed management by some agencies in Ghana. For example, to promote sound cooperation among water resource users and managers, the *Integrated Water Resource Management Policy (IWRMP)* was formulated and implemented in 1996. Five years after, the Water Use Regulation LI 1962 Policy was then implemented to streamline the administration and governance over local water bodies which were under serious threats of degradation. Realizing the weaknesses in the earlier policies, the National Water Vision Policy was formulated and consolidated with other key water sector policies to comprehensively manage the nation's water resources.

The attempts by government of Ghana was to emulate successful watershed management policies such as that of Restoration of the Alps of the United States, Integrated Soil and Water Management (ISWM) in Brazil, which were used for rehabilitation, restoration and conservation of watershed resources (Maarleveld and Dangbegnon, 1998).

However, in spite of all these policies and regulations, the Inchaban Watershed in the Western Region of Ghana is still under the threat of degradation. The Inchaban

Table 1. Watershed management policies formulated by the Ministry of Water and Housing (MWH).

Date formulated	Policies formulated	Goals to be achieved
1996	Integrated Water Resource Management Policy (IWRMP)	To promote sound cooperation among water resource users and managers
2001	Water Use Regulation LI 1962 Policy	To streamline the administration and governance over local water bodies
2006	Drilling for Water and Groundwater Development Regulation Policy LI 1827	To license drilling companies and ensure safe development of watershed resources
2007	The National Water Vision Policy	Being consolidated with other key water sector policies to comprehensively manage the nation's water resources
2012	The National Buffer Zone Policy	To initiate the development of programmes to safeguard watershed resource.

Source: Ghana Ministry of Works and Housing, 2010.

Watershed is degraded due to a number of anthropogenic factors such as expansion of cultivated areas, unsustainable fuel wood and timber harvesting, bushfires, and the development of settlements and other infrastructures (Carson, 1992). For instance, according to Button (2010), the rate in which the Inchaban watershed is built-up is 7.6% per year. The increasing encroachment of the watershed has adversely affected economic activities such as fishing and farming. For example, the quantity of charcoal production, a major economic activity of the inhabitants, dropped by 30% between 2007 and 2009 (Biney, 2010). This raises a number of questions about the adherence to the policies set out by government (Table 1) to support the institutions responsible for managing the Inchaban Watershed. It is against this background that this study seeks to identify the approaches and the challenges against the effective use of policies set out by government to effectively manage the Inchaban watershed. The subsequent sections look at the conceptual framework of the study followed by the methodology and analysis of results.

Conceptual framework

The integrated watershed management framework: IWM-framework

The Institutional Framework for Integrated Watershed Management developed by the Water Resource Commission of Ghana (WRC) has been adopted for this study. The choice of this conceptual framework for this study is informed by the definition of integrated watershed management as a comprehensive multi-resource management planning process involving all stakeholders within the management processes. Stakeholders in watershed management are expected to work cooperatively to identify an approach that is

environmentally friendly and economically sustainable (Botero, 1986; United Nation Environment Programme (UNEP), 2004). In the framework, the WRC is the superior body empowered by an *Act of Parliament (Act 522 of 1996)* to grant rights to watershed users to allocate watershed resources, and to implement policies. The strength of this framework (Appendix Figure 1) is that it spells out clearly the processes to govern watersheds in terms of policy formulation and implementation. The IWM-framework designed by Water Resources Commission (WRC) was tailored to address the diffused functions and authority of institutions concerned with water resources management with the aim of integrating their roles, objectives, mandate, policies and laws. Going by this framework, the National Development Planning Commission (NDPC) and the Ministry of Works and Housing (MWH) are expected to work in collaboration with the WRC to specifically coordinate national development plans and also formulate national water policies. The WRC supervises the activities of key representative groups that are involved in water services delivery and utilization. These actors are the Water Research Planning Input Providers, Water Users, Regulatory Agencies and Civil Society Representatives. The roles and activities of the representative groups are summarized in Appendix Figure 1.

METHODOLOGY

Study area

The Inchaban Watershed is located in the Shama District of the Western Region of Ghana (Figure 1). The size of the watershed is 13,553.80 acres. The climate is dry-humid tropical (Acheampong, 2009), and has a double maximum rainfall; the main rainfall season lasts from June to early August, and the minor from September to November. The average annual precipitation is 1195 mm (Acheampong, 2009). The dry season is short, occurring from

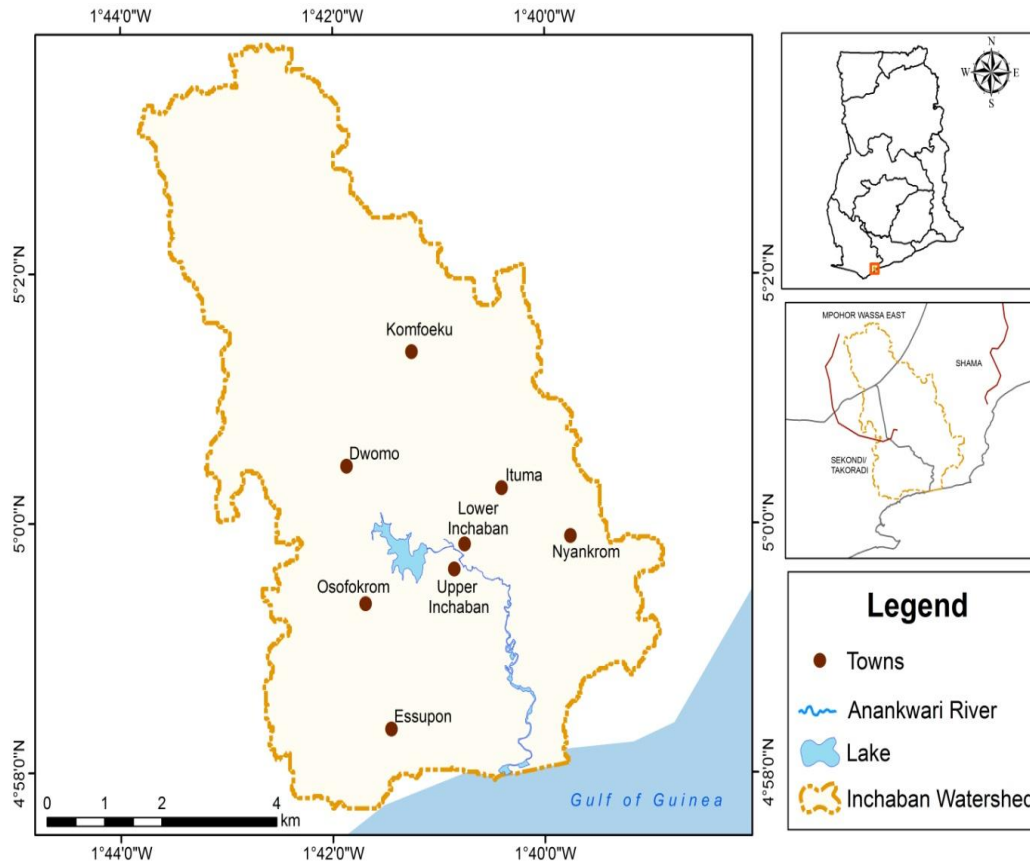


Figure 1. Map of the Inchaban Watershed. Source: Cartography Unit of the Department of Geography and Regional Planning (UCC), 2011.

December to February. The average annual humidity of the area is high (over 94%) and the mean annual temperatures are 29°C. The main vegetation in the watershed consists of woodland savannah near the coast, while a semi deciduous forest occupies the upper courses of streams. Mangroves occur along the southern portion of the watershed. The nature of the climate and vegetation of the district has limited the growth of most local food crops but rather sugar is extensively cultivated. Consequently, mining and charcoal burning activities have absorbed about 45% of the active labour force. Many pockets of farming activities occur in communities such as Dwomo, Nyankrom and Ituma whereas charcoal burning activities have been intensified in portions of the watershed at Inchaban.

The relief of the study area is undulating, gently sloping towards the coast, and is interspersed with plains in the west. The landscape is characterized by muddy lagoons and marshlands as a result of the undulating topography. The district is drained by River Anakwari. River Anakwari is dammed at Inchaban to supply potable water to Takoradi and its surrounding settlements that include Dwomo, Nyankrom, Ituma, Shama and Yabiw. Drainage in the district is very poor; the area is prone to flooding.

Research design

The descriptive research design was used in the study. This research design incorporated scientific methods which involved observing and describing the behavior of respondents without

influencing them in any way (Creswell, 2003). The method helped to describe the social systems, social events and background information related to the study. It also helped to stimulate explanations (Sarantakos, 1998). This method as observed by Hakim (2000) is the best because it helps to give a thorough picture of a phenomenon, and the changes that have occurred in a phenomenon over time.

The study population

The target population comprised all the state user and management institutions, non-governmental organisations (NGOs), local authorities and individuals who engage in economic activities in the watershed. The relevant state institutions identified were the Water Resource Commission, the Environmental Protection Agency (EPA), the Forestry Commission (FC), the Mining Commission (MC), the Hydrological Service Department (HSD) and the Water Resource Institute (WRI) of Ghana. The non-governmental organisations were the Coastal Resource Centre (CRC) and the Friends of the Nation (FON). The state user institutions are the Irrigation Development Authority (IDA), the Ghana Water Company Limited (GWCL), the Community Water and Sanitation Agency (CWSA), the Mining Commission (MC), the Ministry of Food and Agriculture (MoFA) and Hydrological Service Department (HSD). The individual respondents comprised residents from three selected communities which were Ituma, Inchaban and Dwomo (Figure 1).

Table 2. Total sample size for the study.

Sample units	Sample size
Watershed management organizations	4
Watershed user organizations	4
Community chiefs	3
Individual users	
Crop farmers	9
Charcoal producers	12
Fishermen	9
Total	41

Sampling procedure

Two non-probability sampling methods were used to select the respondents: The purposive and convenience sampling methods. The purposive sampling technique was first used to select the chief of three settlements (Inchaban, Ituma and Dwomo) from a total of eight settlements (Komfoeku, Dwomo, Osofokrom, Essupon, Yabiw, Ituma, Nyankrom and Inchaban, within the watershed. The chiefs were selected because their subjects were engaged in economic activities in the watershed, and can therefore be in the position to provide relevant information to the study. Four organisations (EPA, FC, WRC and CRC) were selected from a total of seven watershed management organisations that were the Environmental Protection Agency (EPA), the Forestry Commission (FC), the Mining Commission (MC), the Hydrological Service Department (HSD), the Water Resource Commission, the Water Resource Institute (WRI) and the Coastal Resource Centre (CRC). The four selected management institutions were identified to be active, and each entrusted with different duties in the management of the watershed. Hence, each of them could provide unique information relevant to the study. Four watershed user institutions (IDA, GWCL, MOFA and CWSA) were also selected from a total of six user institutions that were the Irrigation Development Authority (IDA), the Ghana Water Company Limited (GWCL), the Community Water and Sanitation Agency (CWSA), the Mining Commission (MC), the Ministry of Food and Agriculture (MoFA) and Hydrological Service Department (HSD). The two institutions: MC and HSD that were not selected were observed to be dormant. The selected user institutions were identified to be active and engaged in several different economic activities in the watershed. As such these selected user institutions could provide useful information to the study. Additionally, the convenience sampling technique was used to select nine crop farmers out of 15 in Ituma, 12 charcoal producers out of 16 in Inchaban and nine fishermen out of 15 in Dwomo. Focus group discussions (FGDs) were conducted for these individual users in their homogeneous groups from the above-mentioned villages (Ituma, Inchaban and Dwomo). Therefore, in all, a total sample population of 41 was used in the study (Table 2)

Data collection instruments and techniques

The data collection instruments employed consisted of three (3) sets of in-depth interview guides, three sets of focus group discussion guides and an observation checklist. The in-depth interview guides containing a number of unstructured questions were each used to collect data from the chiefs in the three settlements, from the management institutions and from the user organisations respectively. The set of questions in the in-depth interview guides elicited responses on issues regarding the background characteristics of respondents, effectiveness of the approaches and the challenges confronting the management

institutions responsible for managing the Inchaban Watershed.

Three sets of focus group discussion guides (Appendix 2) were used to collect data from individual users (farmers, fishermen and charcoal producers) of the watershed (Table 2).

Data processing and analysis

The data collected was conceptually organized into themes which were based on the objectives of the study such as assessment of the effectiveness of the approach used to manage the Inchaban Watershed and the challenges of the management institutions to implement policies set out by government and analyzed manually, while the data collection was still on-going. This method was employed so as to intensify probing into issues on more specific aspects of the objectives of the study. Again, the analysis during the data collection was important because it guided the study to facilitate a more effective treatment and coverage of the research topic (Benini, 2000). Conclusions drawn after the analysis were tested against notes and records from the field.

RESULTS AND DISCUSSION

The results of the study under the following sub-headings:

1. Assessment of the effectiveness of the approach used to manage the Inchaban Watershed
2. The challenges of the management institutions to implement policies set out by government.

Assessment of the approach used to manage the Inchaban Watershed

Focus group discussions (FGDs) to assess the management approach with the key societal groups in the local communities surrounding the watershed revealed that there have been several discussions with the individual users on best farming practices. Farmers, for example, had understood very well the concerns of the government about the conservation of the watershed. Indeed the chiefs of the settlements admitted that they had been involved in the discussions on planning and implementation of projects such as contour farming, vegetative barriers and earth bunds to erosion control. Interviews with the chiefs of settlements in the watershed agree with the bottom-up approach used in managing the Inchaban Watershed. This falls in line with the findings of Thoruw and Juo (1995), who made the observations that the first among the local authorities to confirm the practice of the bottom-up approach was a chief of one of the communities who recalled that:

“Officials from almost all the management institutions come to me to solicit my views on a number of projects to conserve the watershed. I quickly invite the leaders of the Crop Growers Association, and schedule time to meet the other farmers in the field. Agreeably, we meet the

farmers about a week or two, and have discussions on a few projects such as contour farming, vegetative barriers, and earth-bunds projects. The officials also educate the farmers and take some of their concerns to government for policy formulations.” (Village chief, Inchaban Watershed)

Even though the bottom-up approach was started, for it to be successful, according to Leach and Sabatier (2002), local people are expected to be involved in important stages of the project cycle such as monitoring and evaluation. Leach and Sabatier (2002) further made the observations that participatory watershed planning must go beyond initial implementation of policies to yield good results. However, the focus group discussions with the individual users and chiefs indicated that the watershed institutions never made any special arrangements to involve the local people in monitoring projects. By implication, as identified by Martin (2008), the management institutions find it difficult to arrest free-rider behaviour among the individual watershed users. As a result, the management institutions such as EPA and FC could not evaluate projects such as tree planting, protection of river banks, protection of land from erosion, soil fertility projects, contour farming projects, vegetative barriers and earth bunds projects, land and water management projects, among others to reshape subsequent plans based on future impacts of the projects in the watershed. Instead, the management institutions resorted to a simple method of tasking some untrained influential members to provide security for implemented projects. With this approach, according to the charcoal producers, the institutions never had good feedback to assist them to redesign future projects. It therefore, became difficult to discourage negative practices on the watershed. One of these charcoal producers had this to say:

“The EPA and the FC came to plant some trees in the watershed in 2008. The officers in the management institutions had made fruitless attempts, over the years, to arrest illegal users because they relied on people from this community to provide security for their projects. It will be very advisable for some of the officers to come and live with us here to make their work effective” (Charcoal producer, Inchaban Watershed).

More importantly, the suggestions of the local communities were expected to reach top management authorities on time for quick implementation of projects and granting of watershed use rights. However, the user institutions and individual users complained that it took them about half a year before their concerns were sent to the WRC. Additionally, the users of the watershed who had been convinced to accept the bottom-up approach complained about the bureaucracies involved to obtain permission from the top officials. For example, the district

head of the Irrigation Development Authority (IDA), who had had several confrontations with the heads of the National Development Planning Commission (NDPC) and Water Resources Commission (WRC), in the course of obtaining permission for the local users for crop farming irrigation, poured out his sentiments about the management system as follows:

“We expect our higher authorities (NDPC and MWH) to submit our development plans to the WRC on time for quick feedback. Unfortunately, since 2005 we have not been given authority to grant permission on any project plan sent to the NDPC especially” (District Head, Irrigation Development Authority, Inchaban Watershed).

According to Sabatier et al. (2002), for successful watershed management, top managers are supposed to, in addition to existing policies; spell out other management policies without delay to allow needful economic activities. Findings from the study indicated that this was not the case. It was found out that the top managers (MWH, NDPC and WRC) of the Inchaban Watershed did not have policies to allow local users to conduct economic activities. Hence, the bottom-up approach was not attractive to local users.

Sectoral approach of watershed management

In other interviews, the heads of the selected institutions admitted that most of them had implemented programmes with different priorities regarding the management of the Inchaban Watershed. It also followed that the user and management institutions had, in addition to bottom-up approach, started using the sectoral management approach. These results fall in line with the findings of Pretty and Shah (2000), where watershed management agencies implement programmes according to their own targets and priorities.

Following the sectoral management approach, it was discovered that the Ghana Water Company Limited (GWCL) confined its operations to the improvement of the quality of water from the watershed. Whereas the Environmental Protection Agency (EPA) implemented projects such as the Invasive Aquatic Water Project, Water Hyacinth and Lettuce Projects towards protecting aquatic life in River Anakwari. The interviews again revealed that the Ministry of Food and Agriculture (MoFA) and the Irrigation Development Authority (IDA) had been focusing on soil rehabilitation projects. Incidentally, the management institutions had followed the national development plan that had a specific goal of conserving the watershed but took operations with different objectives, making them unsuccessful. With the fast depletion of the Inchaban Watershed, the heads of the management institutions expressed displeasure in the sectoral approach, and therefore proposed for the

establishment of joint projects that will involve all the stakeholders who matter in managing the watershed. This will help take into consideration the views and opinions of all affected groups, users and individuals who use the Inchaban Watershed. When this is done, the concept of integration and better sustainability of watershed resources will be enhanced (Ozyuvaci, 1997).

On the other hand, the individual users of the Inchaban Watershed rather embraced the sectoral management style because they realized that when the institutions worked independently, they had a leeway to take permission from any of them (the institutions). For example, the local charcoal producers commended the Forestry Commission (FC) for supporting them with ideas and strategies to increase their production using the Acacia trees from the watershed. A forty-year old charcoal producer had this to say:

“We are highly indebted to the Forestry Commission; the institution has, over the years, supported us with permission right to use the Acacia trees in the watershed. It is good that the Ghana Water Company Limited had concentrated on the management of water in rivers and left the forest trees for the Forestry Commission to manage. Taking separate functions like this will help to conserve the watershed” (Charcoal producer, Inchaban watershed).

In another instance, the crop farmers in a typical farming community (Ituma) in the watershed commended the Irrigation Development Authority (IDA) for educating them on soil conservation strategies. One of them at Ituma frankly said:

“Since 2000, we have had several supports from the IDA. Most at times, the IDA supplies us with equipment such as water pumps and cutlasses for cultivation to prevent soil erosion. The IDA also organizes workshops on projects for soil rehabilitation to support our work” (Crop Farmer, Ituma Village, Inchaban Watershed).

In summary, the FC, the GWCL and the IDA concentrated on the management of the forest trees, rivers and the soils in the Inchaban Watershed respectively. These findings conform to the results by Economic and Social Commission for Asia and the Pacific (ESCAP) (1997) when they assessed the use of sectoral management approach in the success of the Mahaveli Project Schemes worked on by state institutions in Sri Lanka.

Challenges to the implementation of watershed policies

Challenges related to coordination among the management institutions

The WRC, MWH and the NDPC operate at the top level of decision-making and are expected to coordinate the

activities of the FC, EPA and the CRC to prevent conflicts with the user institutions (IDA, CWSA, GWCL and MoFA) (Amakye, 2002).

Here, we assess the level of coordination among the institutions at the top level of decision making and allocation of watershed resources. Interviews with the head of the WRC showed some level of collaboration among the institutions (WRC, MWH, and NDPC). For example, the head of the WRC had policies (Table 1) that the MWH and the NDPC respectively, had designed to support its (the WRC) work. Better still, we also assessed the extent to which this collaboration had gone. Further discussions on management duties with the head of the WRC revealed that the WRC had failed to take up subsequent follow-up duties with the NDPC and the MWH, to ensure that policies and laws instituted were being obeyed by the local users of the watershed. This shows a poor collaboration between these institutions (NDPC, MWH and WRC).

Social challenges

One realizes that as population grows, societies become dynamic and it calls for a review of laws and policies governing resources use (Heckathorn and Maser, 2001). In interviews with the local people concerning resource use in the watershed, it came out that there were illegal building construction, illegal agricultural encroachment and large-scale illegal logging in the Inchaban watershed (Plate 1). Such practices have been vehemently fought against by the management institutions such as the EPA, FC and WRC offices in the area by the use of prohibitive laws such as the use of land guards in protecting the forests, use of taboos, vegetation cannot be cleared along a strip of 30 m at both banks of streams and rivers and days and periods when fishing, farming and hunting are prohibited or forbidden. Yet, since 1996, the Ghana WRC had approved the ‘Integrated Watershed Management Policy’ which allows diverse uses of all watersheds in every region. Thus, the prohibitive laws contradict the policy of the government to promote the concept of integrated watershed management.

This meant that, with increasing demand for land for settlements and other private uses such as farming and construction of buildings, the work of the NDPC and MWH was to collaborate with the WRC to re-formulate policies that could permit urgent uses of the Inchaban Watershed in order to follow the approved management approach. Without any options for land for survival such as for farming, fishing and charcoal, the individual users buy watershed usage rights (rights to enter, right to use, right to take wood or selling the land out) from the government institutions. In an in-depth interview with the head of the WRC, some explanations were given about the institution’s reluctance to allocate the watershed resources to the local users. This is what the head of the Water Resource Commission had to say:



Plate 1. Acacia trees cut down in the Inchaban Watershed. Source: Fieldwork, June 2012.

“We cannot permit all users including individuals to use the watershed because the watershed vegetation is fast depleting. We normally give priority to state institutions like the IDA, GWCL and CWSA. We had entrusted the use of the watershed to the state institutions whose activities are environmentally sustainable and in the interest of the entire society. Unfortunately, individuals rather get the chance to work on the lands demarcated. We have the information that some of the state institutions have sold their usage rights to these individuals but we find it difficult to prosecute them” (Head, WRC, Inchaban Watershed).

Legal capacity challenges

The *Water Use Regulation Act of 1962*, supports the integrated water resource management policy of Ghana, and gives WRC the mandate to regulate the use of all water bodies in the country. To make the work of WRC easier, the EPA, FC, NGOs and local authorities have also been assigned specific and separate roles to support the WRC to manage water bodies. Serious conflicts were detected among the local management and user institutions. The local chiefs in the first place, said that the state management institutions did not give them room to exercise their powers. From the *Statutory Land Administrative Act 125 of 1962* of Ghana, power is only given to the WRC to plan and manage watersheds and the subordinate institutions and civil society organizations such as the local chiefs are to conform, not exercise power. The chiefs recalled instances where they had given permission to some of the farmers and fisher folks to use the watershed, and have been chased away by the management institutions. For example, the queen

mother of one of the communities made it clear that it was time they claimed portions of the watershed to support local economic activities. This is what she said:

“In colonial times, portions of the Inchaban Watershed were demarcated for our forefathers to use. It is just about time we reclaimed the lands that belong to us to support the local people here. We will not sit down and watch other people to use the watershed illegally. I have written several letters to take permission from the management institutions for the local users of the watershed but have not had any good feedback. Personally, I grant some of the local people usage right when they ask for help. I know they receive threats from the government authorities but we still support them in every way” (Queen Mother, Inchaban Watershed).

The *Statutory Land Administrative Act 125 of 1962* of Ghana supports the state watershed management institutions to regulate and control the use of all lands such as mineral sites, forest lands and water bodies that fall under the areas of interest of the state (Opoku-Agyemang, 2001). For state watershed management institutions to work effectively, government of Ghana has established institutions as the Lands Commission, the Survey, Town and Country Planning Department and the judicial courts to support the state’s claim for lands for social development. However, the reports obtained from the management institutions showed that the state judicial system, unfortunately, is weak to support governance over the Inchaban Watershed. In most cases, the reports were that certain institutions took bribes from individual users and overlooked the illegal activities in the watershed. Others have also supported some political leaders to erect structures for self-owned

businesses in the watershed. To make the situation worse, as was indicated by an official of the Environmental Protection Agency, the judicial courts went on adjourning cases involving illegal users of the Inchaban Watershed. He said frankly that:

“Since the last four years we have sent three major cases to the courts requesting the support of the Takoradi Court to stop the construction of buildings in the watershed. As I speak to you, there are two additional cases of illegal construction in the watershed. The courts kept on adjourning the hearing of these cases. We have persistently referred the cases to the local chiefs for support but, to our dismay, the chiefs go behind us to encourage the illegal users of the watershed. Some of the heads in the other sister watershed management institutions pay bribes to the court officials for the cases to be adjourned” (EPA official, Inchaban Watershed).

The poor cooperation among the management institutions posed legal challenges for the institutions to battle with. Once the management institutions neglected collaborative project building and thus followed, to a large extent, the sectoral management approach, there were always conflicting interests that resulted in serious legal challenges.

CONCLUSIONS AND RECOMMENDATIONS

Two main approaches (the bottom-up and the sectoral approaches) were discovered to be in use for the management of the Inchaban Watershed. The bottom-up approach was least practiced due to challenges of getting community support after the project implementation (to conserve the Inchaban Watershed). Also, the results obtained in this study indicated that there was not regular monitoring and evaluation by the management institutions to ensure successful project implementation. Again, there was limited involvement of the local community in important stages of the project cycle such as the monitoring and evaluation phase. These were challenges to the smooth and successful practice and adoption of the bottom-up approach in watershed management of the Inchaban watershed. Also, the sectoral management approach was adopted due to the fact that management institutions concentrated on different aspects of the watershed in order to conserve it. Assessment was also made of the institutional linkages among the top watershed management institutions to see how best the policy of integrated watershed management has been implemented. Findings from the study indicated that the NDPC and the MWH collaborated poorly to support the work of the WRC. The NDPC and the MWH had only formulated watershed use policies and coordination of projects respectively but have neglected important follow-up duties to ensure that the policies are being implemented and enforced. Little has been done

about monitoring, evaluation and assessment of the achievements over the years. The linkages between traditional authorities such as chiefs and management organizations (EPA, FC, WRC and CRC) were also poor and this poses legal challenges. The mandate of watershed management institutions supported by the *Watershed Resource Act 522 of 1996* though has been stated clearly in the Customary Land Administrative Policy document (this document supports Ghanaian local chiefs to manage local and indigenous resources). It appears this document is not known to many chiefs and other traditional leaders.

In connection with the key findings and conclusions drawn, the following recommendations have been made:

1. Government should ensure better implementation and fixing the problems in the current policies or there should be system to promote sound institutional arrangements among the watershed management institutions responsible for the Inchaban Watershed.
2. It should be the policy of the government to educate local authorities to constantly support the operations of watershed management institutions.
3. To attract the participation of the communities surrounding the watershed, there is the need for building the capacity of government institutions in implementing more participatory, multi-stakeholder approaches to watershed management”.

Conflict of Interest

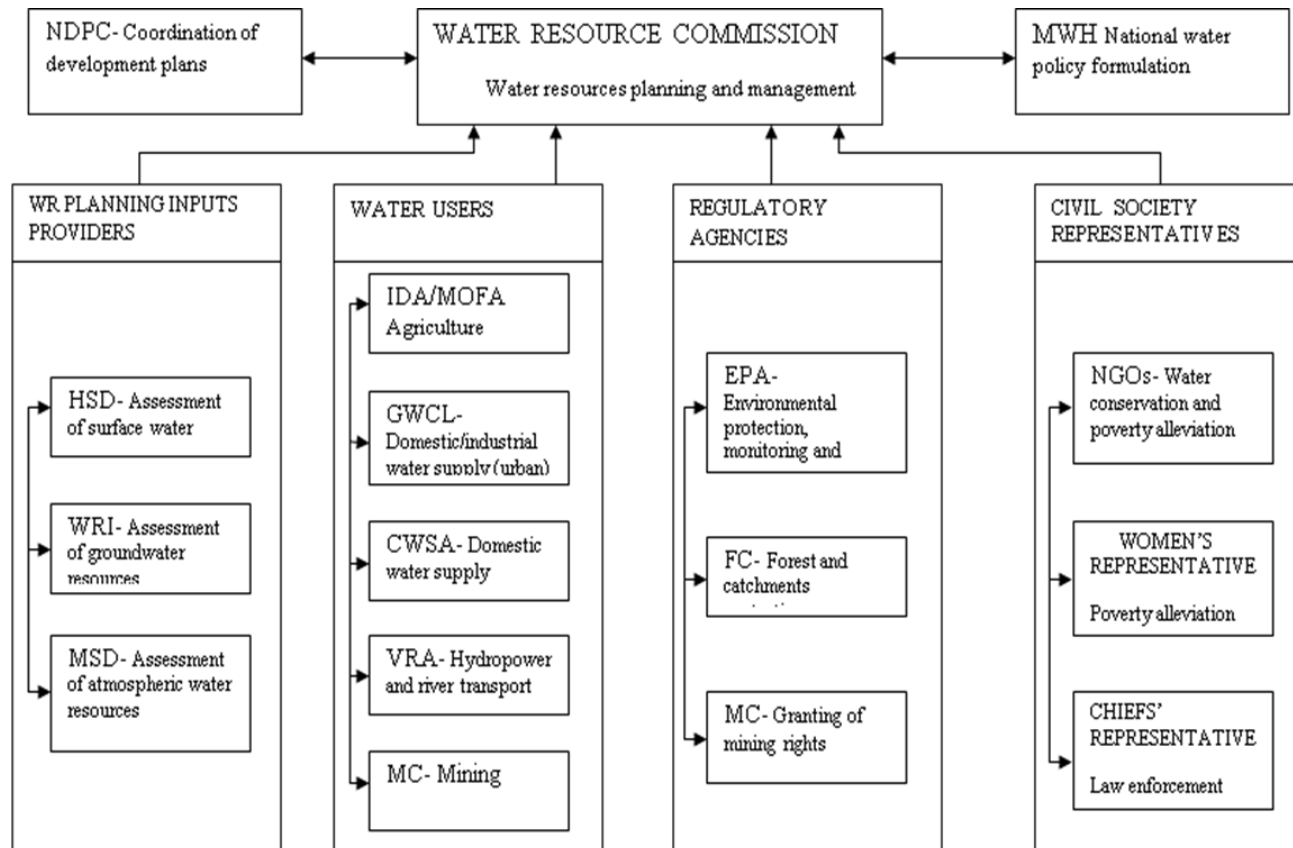
The authors have not declared any conflict of interests.

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APPENDIX



Appendix Figure 1. The Integrated Watershed Management Conceptual Framework. Source: Ghana Water Resources Commission, 2000.

Appendix 1: The Integrated Watershed Management Framework. Source: Ghana Water Resources Commission, 2000

Appendix 2: Focus group discussion guide for crop farmers, fish farmers and charcoal producers

Date of interview:
 Place of interview:
 Interviewer name:
 Time of interview:

The main objective of the study is to examine the institutional arrangements in managing the Inchaban Watershed. The study is primary for academic work, and therefore you are assured of full confidentiality, privacy and anonymity of all the information that you will give. Please or kindly answer each question to the best of your ability by providing responses that best reflect your opinion.

Section A: Watershed management approach

1. Mention some of the organisations in charge of managing the watershed. Probe: What roles do they play?

2. Do the government authorities involve you in managing the watershed? If Yes, Probe: Where is involvement done? Indecision making, formulation of management policies, implementation of project policies, monitoring and evaluation.

3. What are some of the projects initiated in your community to manage the watershed? Probe: The nature of the projects (e.g. terracing, tree planting etc), when the projects were started, which organisation initiated the projects, challenges encountered in starting projects, success stories of projects. Are the projects done jointly by individuals and government organisations, or are the projects done jointly by NGOs and government organisations?

4. Do the organisations have different management activities which concentrate on different aspects of the watershed (use the sectoral approach)? If Yes, Probe: Type of activities (e.g. contour-bunding, landslide fencing, gully control, plantation growing, etc.), times that the departments do such activities, aspects of the watershed (e.g. forest, land or water) that the activities are aimed at, challenges encountered in this approach, advantage of this approach.

Section B: Economic activities of user organisations and their effect on the economic activities of local inhabitants

1. What are some of the economic activities that user organisations undertake on the watershed? Probe; farming, fishing, sand winning, (any other?, Please specify).
2. What products do they obtained from the watershed? Probe: (a) Food; which kind (cereals, grains, tubers, etc.), how do the activities of user organisation affect your output level (increase or decrease by how much). What is the quantity? (b) Employment; what type of employment, how does the activity of user organisations affect the security of your job, are there any other sources of employment?
- 3 Do the user organisations have any alternative source instead of using the watershed?

Section C: Activities of watershed management organisations and their effects on the economic activities of the people

1. What are some of the conservatory activities of the management organisations? Probe; tree planting, terracing or contour “bundling”, (any other?)
2. How does the activity of the management organisation affect the following. Probe: (a) Food, which kind (cereals, grains, tubers, fish etc.) how does the activity of user organisation affect your output level (increase or decrease by how much); what is the quantity. (b) Employment, what type of employment, how does the activities of user organisations affect the security of your job, are there any other sources of employment?
3. Do the user organisations have any alternative source instead of using the watershed?

Section D: Assessment of the drainage basin management institutions on the principles of transparency, accountability and participation

1. Transparency (openness of governance processes and free access to official information): Are there available information about who, how and what decisions are made at the district assembly level? Probe (If yes, is the information available in a format and language that is easily understood by non-experts, accurate and up-to date? Is the information timely (that is, was it available prior to key decision-making processes such as planning, a town-hall meeting or available websites or on public notice boards); How long does it take to get the information?

2. Accountability (a set of controls, counterweights and supervision modes that make officials and institutions in the public and private sector answerable for their actions): Are there internal control mechanisms, checks and balances within the drainage basin management institutions to ensure internal accountability. Probe: Are there monitoring and evaluation institutions that ensure to check the services provided by the drainage basin management institutions? Is there an independent body that oversees and monitors state institutions to ensure that established norms and standards are met? Has the state oversight institutions got the legitimate power to demand accountability on both fiscal management and performance of management institutions? Are there laws, rules and regulations that govern the accountability relationship between oversight institutions?
3. Participation (the possibility for citizens to provide informed, timely and meaningful input and influence decisions at various levels): Are there mechanisms for citizens to express themselves and influence decisions and processes in the management of drainage basin? Probe: Are your decisions being heard and taken into consideration during town hall meetings? If Yes to Question 3 at which stage are you given the opportunity to make suggestions to the management of the drainage basin?

Formulation of management policies [] Often [] very often [] not often []
 Implementation of project policies [] Often [] very often [] not often []
 Monitoring and evaluation [] Often [] very often [] not often []

In each case indicate how often (the opportunity is given decision making (Often, Very often, Not Often).