

APPROACHES TO WATERSHED MANAGEMENT IN GHANA: A STUDY OF THE INCHABAN WATERSHED

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Abstract

By the end of 1980, the failure of engineering-led approach to watershed management was clear in most developing countries, and international agencies had to undertake a major rethinking into a better approach. The challenge to these countries was to develop an integrated management system that would bring the needs of local people and the interest of management organisations on board. This paper explored the various approaches and the level of coordination that exist among watershed management institutions in Ghana after the post independence era and suggested best approaches for policy formulation and implementation. Using in-depth interviews and focus group discussions guides, information relating to the developments in the Inchaban Watershed was solicited from 41 key respondents selected from the management and user institutions, chiefs and individual users. The results of the study revealed that the Inchaban watershed management institutions started using haphazardly two approaches to management: bottom-up and sectoral. The management institutions afterwards cooperated poorly in policy formulation, implementation, monitoring and evaluation of projects making them unsuccessful to achieve their main aim of conserving the Inchaban Watershed. It is therefore recommended that the WRC, NDPC and MWH which are at the top of affairs in watershed management should collaborate effectively, and follow strictly the rules enshrined in either the bottom-up or sectoral approach.

Keywords: watershed management, management institutions, user institutions, bottom-up, top-down, sectoral, Inchaban

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Introduction

An engineering approach characterised the first generation of watershed management programmes in developing countries between 1970 and 1980 (Blackburn & Holland, 1998). During this time, watershed management practices and governance in countries such as Malawi were largely considered as technical packages with purely physical measures designed to manage soil and water resources in medium and large river valleys (Meadows, 2003). The objectives of such management programmes were to prevent rapid runoff of water, slow down siltation of reservoirs downstream, and to limit the incidence of potentially damaging flash flooding (Liao, 1976). Subsequently, targets were set in relation to immediate environmental protection rather than long term physical economic output (Roux, 2008). By the end of 1980, the failure of engineering-led approach in watershed management was clear in most developing countries, and international agencies undertook major rethinking into a better approach (Darghouth, 2008). The challenge was to develop an integrated management approach that would bring the needs of local people and the interest of management organisations on board (Magrath & Doolette, 1990).

In the case of Ghana, several attempts have been made over the past two decades to discover a proper watershed management approach. 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 as a whole (Odame, 2010). Unfortunately, the advents of Christianity, western education, and urbanisation, and the desire to develop the resources of the country have reduced the effectiveness and respect for traditional restrictions used to protect watershed resources in

particular (Opoku-Agyemang, 2008). Hence, customary administration over watersheds had challenges such as evaluation and assessment of damages and integrating the rights of watershed users with policies on regulation and conservation (Gibson, 2001).

In the face of these numerous problems in the reliance on customary laws and practices, the government of the Gold Coast now 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 watershed 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 basin, 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 of agencies and institutions with specific roles for water supply and irrigation in watersheds. As compiled by Opoku-Agyemang, Micheal, Manu and Bossman (1998), Table 1 demonstrates the attempts made by previous governments to improve watershed management in Ghana. For example, the

Ghana Water and Sewerage Corporation (GWSC), established by *Parliamentary Act 310 of 1965*, and now called Ghana Water Company Limited (GWCL), manages and controls water supply and, to a very limited extent, sewerage. The Irrigation Development Authority (IDA), established by the *Supreme Military Council Decree (SMCD) 85 of 1977*, developed and managed irrigation to increase agricultural production, while the Environmental Protection Council now Agency established by the *National Liberation Council Decree (NLCD) 293 of 1974*, concerned itself primarily with the monitoring of environmental effects from water treatment. The Forestry Commission dealt with the management of forest, lands and water bodies. In their submissions, Opoku-Agyemang et al. (1998) reported low performance rates among the watershed management agencies, and attributed them to less coordination. This, undoubtedly, fell in line with similar sectoral watershed management approaches which yielded poor results when practiced in some developing countries like India, Brazil and other West African countries.

Table 1: Watershed institutions and respective Ministries in Ghana

Institutions	Ministry	Legal enactment
Ghana Water and Sewerage Corporation	Works and Housing	Act 310 of 1965
Irrigation Development Authority	Ministry of Food and Agriculture	SMCD 85 of 1977
Meteorological Service Department	Communications	Administrative
Water Resource Research Institute	Works and Housing	Administrative

Environmental Protection Council [now called the Environmental Protection Agency (EPA)]
Forestry Commission
Environment Science and Technology
Lands and Forestry
and NLCD 293 of 1969 and was re-established in 1994 as EPA
National Redemption Council
Decree (NRCD) 239 of 1974

Source: Ghana Water Resource Commission, 2000

The government of Ghana later, in 1996, identified the gaps and weaknesses regarding the coordination among the various institutions in the country, and took significant steps to address the diffused functions and authority of such institutions in charge of watershed management (Amakye, 2002). In order to integrate the functions of watershed managers and users rights, the Water Resource Commission (WRC) of Ghana was established by an Act of Parliament (*Water Resources Management Act 522 of 1996*); the WRC was empowered with a superior mandate to allocate watershed resources and implement policies on conservation. To ensure effective delivery of its duties, the WRC was placed on the shoulders of the National Development Planning Commission (NDPC) and the Ministry of Works and Housing (MWH), to coordinate national development plans and formulate policies following a laid down institutional framework (Amakye, 2002). The fundamental reason for bringing on board a laid down institutional framework was to promote an integrated watershed management approach (Amakye, 2002).

However, in spite of all these efforts of government, the Inchaban Watershed in the Western Region of Ghana is still under the threat of degradation causing loss of soil nutrients and thereby adversely affecting crop production. Degradation of the Inchaban Watershed is caused by a number of factors such as expansion of cultivated areas, unsustainable fuel wood and timber

harvesting, bushfires, and the development of settlements and other infrastructures (Carson, 1992). To substantiate these findings, Button (2010) posted an annual percentage increase in built-up areas on the Inchaban Watershed as being 7.6. This raises a number of questions about the management approaches and the level of collaboration that exist among the institutions responsible for managing the Inchaban Watershed. It is against this background that this paper seeks to examine the management approaches vis-à-vis the level of coordination among these institutions. The subsequent sections looked at the theoretical underpinnings and conceptual framework of the study followed by the methodology and analysis of result.

Methodological issues

The study being purely qualitative employed in-depth interview guides and focus group discussion guides to solicit information from respondents. The basic data for analyses in the study was primary data collected from four major groups of stakeholders in the management of the Inchaban Watershed: community chiefs, management institutions, user institutions and individual users. The study employed the purposive sampling methods to select four each of watershed management and user institutions, and three community chiefs as well. With the help of in-depth interview guides, series of interviews were conducted for each head of the management and user institutions, and the three community chiefs. Additionally, the convenience sampling method was used to select the individual users from three main settlements; nine crop farmers in Ituma, 12 charcoal producers in Inchaban and nine fishermen in Dwomo. Three different kinds of Focus group discussions were conducted for crop farmers, charcoal producers and fishermen. Therefore, in all, a total sample population of 41 was used (Table 2).

Table 2: Total sample size for the study

Sample unit	Sample size	Institution
Watershed management institutions	4	WRC, CRC, FC & EPA
Watershed user institutions	4	IDA, GWCL, MOFA & CWSA
Community chiefs	3	
<i>Individual users</i>		
- Crop farmers	9	
- Charcoal producers	12	
- Fishermen	9	
Total	41	

Water Resource Commission (WRC), Coastal Resource Center (CRC), Forestry Commission(FC), Environmental Protection Agency (EPA), Irrigation Development Authority (IDA), Ghana Water Company Limited (GWCL), Ministry of Food and Agriculture (MoFA), Community Water and Sanitation Agency (CWSA)

Results and Discussion

This section presents the results of the study under the following sub-headings:

- Assessment of the approach used in managing the Inchaban Watershed
- Assessment of the level of coordination that exist among the Inchaban Watershed management institutions.

Assessment of the approach used in managing the Inchaban Watershed

A critical observation of the linkages in the Institutional Framework for Watershed Management in Ghana shows a laid down approach to be followed by the Water Resource

Commission (WRC) and its subordinate institutions (Opoku-Agyemang, 2008). The Water Resource Commission (WRC), established by an Act of parliament (Act 522 of 1996) was given the superior mandate to supervise and coordinate the activities of individual users, state management and user institutions, and non-governmental organisations. In all circumstances, it is expected of these subordinate institutions to consult the WRC before taking decisions. The fundamental reason of government for bringing on board the Institutional Framework for Watershed Management was to promote an integrated watershed management approach (Amakye, 2002).

To assess the approach in managing the Inchaban Watershed, focus group discussions were first conducted with the individual users of the watershed. The result was that there have been several discussions with the individual users on best farming practices. The outcomes of the other meetings showed that the 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. Interviews with the chiefs of settlements in the watershed indicated that the bottom-up approach was started in managing the Inchaban Watershed. 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 to meet them for discussions (the local chief of Inchaban)

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 follows that the user and management institutions had, in addition to bottom-up approach, adopted the sectoral management approach where institutions take up different aspects of a common resource to manage. For example, the local charcoal producers commended the Forestry Commission 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.

Assessment of the level of coordination that exist among the institutions in charge of managing the Inchaban Watershed

Cernea (1987) acknowledged the significance of sound networks among laws, policies and organisations: institutions, to bring good results in any natural resource management system. Merry (1993; 3) added that the strength of laws and policies to support the work of an organisation is essential in any management system. He then suggested a supportive judicial system to assist the work of watershed management institutions. Based on the above recommendations, an attempt was made to assess the level of coordination among the management and user institutions, policy formulators and implementers. The WRC, MWH and the NDPC operate at the top level of decision-making, policy formulation and implementation, and therefore are expected to collaborate and coordinate the activities of the management

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

Assessment of the level of coordination among WRC, MWH and NDPC

Assessing the level of coordination among the institutions at the top level of decision making and allocation of watershed resources, the outcomes of the interviews conducted with the head of the WRC showed that there was some level of collaboration among the institutions (WRC, MWH, and NDPC). For example, the head of the WRC disclosed some policies and projects (see Appendix A & B) that the MWH and the NDPC respectively, had worked out to support it's (the WRC) work. Better still, there was the need to assess 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. Hence, it can be concluded that the collaboration between these institutions (NDPC, MWH and WRC) was insignificant to conserve the projects that have been undertaken by the management institutions.

One realises that as population grows, societies become dynamic and it calls for a review of laws and policies governing resources use (Heckathorn & Maser, 2001). In interviews with the local people concerning resource use in the watershed, it came out that there were illegal erection of buildings, crop cultivation and massive harvest of the forest trees in the watershed (Plate 1). Such practices have been vehemently fought against by the management institutions in the area. Yet, since 1996, the Ghana WRC had approved the 'Integrated Watershed Management Policy' which permit diverse uses of all watersheds in every region. Thus, the prohibitive laws of the

management institutions contradict the policy of the government to promote integrated watershed management.

This meant that, with increasing demand for land for settlements and other private uses such as farming and construction of building, 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, the individual users buy watershed usage rights from some of 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:

We can't 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.



Plate 1: Acacia tree lost in the Inchaban Watershed

Source: Fieldwork, June 2012

Heckathorn and Maser (2001) observed serious challenges in natural resource management systems when the managers have conflicting objectives. Fundamentally, the watershed management institutions (FC, EPA and CRC) in the district are expected to work cooperatively in order to achieve their long term goals. To assess the extent of cooperation among the watershed management institutions in the Shama District, interviews were conducted with the heads of the FC, EPA and the CRC. The outcome of the interviews showed that although the institutions had the zeal to start projects, they lacked the ability to cooperatively monitor and evaluate the project developments to successful completion. In some cases, projects were never started even though the institutions had met severally to discuss pertinent issues on them. The institutional heads had complained of many challenges ranging from finance and logistics to human resources that had adversely affected their ability to undertake joint projects.

The EPA gave counter instructions to the individual charcoal producers, and this was never helpful to the FC. Further interviews with an official of a local NGO, CRC, indicated that the EPA and the FC had, on a few occasions, attended workshops on project monitoring after several invitations have been extended. This is a clear indication of the poor cooperation between the above mentioned institutions when it came to monitoring and evaluation. A thirty-two year old charcoal producer gave a submission which indicated a rather poor cooperation among the management institutions. He had this to say:

Forestry Commission sells the acacia trees in the watershed to us. We use the trees for charcoal production to generate income to support our families. Those of us who have been in the business for long have constantly been threatened by officials of the EPA. I think that it will be better if all the institutions come together and make their terms of management clear for us to obey.

Conclusions

Watershed management is an old practice in the natural resources management system in Ghana. Starting with the use of customary laws and traditional community roles, watershed management has realised less achievements in environmental protection. With the advent of modern management approaches, the rudimentary management style has been merged into integrated management approach where concerns and needs of rural settlements are synchronised with government management regulations to bring mutual benefits to all stakeholders. Assessing the approach in place to the management of the Inchaban Watershed, it came to light that two main approaches (the bottom-up and the sectoral approaches) were in use. The bottom-up approach was least practiced due to challenges of getting community support after the project

implementation (to conserve the Inchaban Watershed). Follow-up works of the management institutions to ensure successful project monitoring and evaluation was also a challenge to the smooth practice of the bottom-up approach. Additionally, the sectoral management approach was started when the institutions concentrated on different aspects of the watershed in order to conserve it. In connection with the key findings and conclusions drawn, the following recommendations have been made:

- Government should formulate new policies that will fit into a structured management approach, or system to promote sound institutional arrangements among the institutions responsible for the Inchaban Watershed. Neither of the approaches to watershed management (bottom-up and sectoral) should be discarded by all stakeholders but rather proper mechanisms should be put in place by government to make each of them produce the desired. If the sectoral management approach is to be followed, government must ensure that management institutions are well-equipped to work independently under the supervision of a higher government authority. On the other hand, if the bottom-up approach is to be practiced, government should urge management institutions to take monitoring and evaluation seriously; management institutions should encourage the use of community support as an essential instrument to arrest resource abuse.
- More so the WRC must properly coordinate the activities of the management institutions (FC, EPA and CRC), user institutions (IDA, GWCL, CWSA and MoFA) and individual users. To do this effectively, the WRC must in conjunction with the Survey, Town and Country Planning Department of Ghana erected concrete pillars connected to each other by 'survey lines' to set out the boundaries in the Inchaban Watershed where livelihood and management activities will be regulated.

- 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; it appears it is not known to many chiefs and other traditional leaders. It should be the policy the government to educate local authorities who can influence individual community users to participate in watershed management programmes at all levels; starting from decision-making processes to monitoring and evaluation.

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APPENDIX (A)

Watershed management policies formulated by the 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

APPENDIX (B)

Projects coordinated by the NDPC to support the work of the WRC

Year	Projects coordinated by NDPC for WRC to approve	Organisation which approval is given
1995	Sedentary Farming Project	IDA
2000	Soil Fertility Project	MoFA
2000	Invasive Aquatic Water Project	EPA
2000	The Contour Farming Project	MoFA
2003	Land and Water Management Project	EPA
2010	The Vegetative Barrier and Earth Bunds Project	MoFA
2012	Smallholder Rehabilitation Project	MoFA
2012	Flood Warning Time Project and the Flood Vulnerability assessment project	CRC (a local NGO)

Source: National Development Planning Commission, 2010