FROM PUBLIC OPEN ACCESS TO COMMON PROPERTY: THE PROSPECTS AND CHALLENGES OF INSTITUTIONALIZING BOUNDARIES FOR SELF-GOVERNANCE AND MANAGEMENT OF COMMUNITY IRRIGATION DAMS IN THE UPPER EAST REGION, GHANA

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ABSTRACT

The Hardian solutions to the excessive abuses of common-pool resources are still being contested. On the one hand public ownership is seen as a major draw back to the efficient and sustainable management of common-pool resources, and on the other the challenges of private ownership in addressing issues of equity and access. Self-governing community management groups are now seen as the panacea. The paper explores the mechanisms that the Water User Associations are using to address the critical issues of boundaries. It addresses three interrelated questions, i.e. how do communities: (1) delimit the territoriality of their irrigation schemes? (2) define authority spheres within the context of the traditional land ownership system? (3) define the limits of each individual user within the context of competing users such that conflicts are minimized? The central finding is that, although successes are not uniform across the board, the WUAs are employing ingenious mechanisms to define clear resource, authority and user boundaries to enable them set up workable systems for self-governance and the management of their communal dams in more sustainable ways. On the basis of the findings, it is recommended that for a lasting impact, the Ministry of Food and Agriculture (MoFA) will need to assist the emerging WUAs in this process of institutionalization.

Keywords: Open Access, Boundaries, Common Property, Ghana, Irrigation, Self-governance.

1. INTRODUCTION

The Hardian tragedy of the commons has assumed more critical dimensions today than it had nearly four decades ago when Hardin first published his historic works on the "tragedy of the commons" (Jensen, 2000; Bromley, 1992; Dolšak and Ostrom, 2003). Dolšak and Ostrom (2003: 1) argue that rather than anticipating its demise, common-pool resources have become "a core type of resources of major theoretical and policy significance for so long as humans continue to rely on water, air and the atmosphere". While there is general agreement with Hardin's forceful claim that "freedom in a commons brings ruin to all," what is heavily contested, however, is his claim that "the only way to prevent such tragedies was for resources to either be privately owned or regulated by the government" (Jessen, 2000). Hardin's argument is premised on the "main stream view that local people are responsible for causing

natural resource degradation" (Benjaminsen, 1995). It is with the objective of preventing the Hardian tragedy of the commons that governments in Africa, and other parts of the world, have, until recently, assumed the direct control and management of natural resources, such as forest, water bodies, game and wild life. The suitability of governments' direct control of what should properly be locally managed for the livelihood sustainability of the poor is increasingly being questioned (Bailey and Zerner, 1992, Benjaminsen, 1995; Fairhead and Leach 2004). Fairhead and Leach (2004: 13) argue that "the alienation of local resource control to state structures ...", among other factors, account for resource management failures in most parts of the third world. Bailey and Zerner (1992: 5) attribute these failures to the fact that "central governments lack both the detailed knowledge and the enforcement capability necessary to manage..." Governments' failures coupled with the reluctance to entrust common-pool resources to private entrepreneurs to manage as normal businesses, have resulted in the growing pressure for local participation in the management of common-pool resources (Dupar and Badenoch, 2002; Larson et. al., 2005). But can local institutions address these problems, where central governments with their paraphernalia of state bureaucracies, technical staff and wide financial resource bases have failed?

In this paper, we investigate this question using the emerging experiences of the Water Users Associations (WUAs) in their self-governance and management of small scale irrigation schemes in northern Ghana. First, we introduce the larger problematic issues in the ongoing debate on the best institutional framework for governing the commons and the rationale for the shift from public ownership and management to community ownership and management, referred to here as public open access and common property respectively. We then define the specific research problem of this paper in the context of the policy and operational frameworks of the small scale irrigation schemes in Ghana in the second part. In the third part, we elaborate the contextual issues and define key concepts employed in the study. We then present the three empirical case study communities in the fourth part, where we explore the linkages between the institutionalisation of the territorial, authority and user boundaries and the emerging patterns of self-governance and management processes they produce. We conclude the study with a summary of the prospects and challenges of the WUAs management of the three small scale schemes and the policy and practical implications of the emerging experiences.

2. DEFINING THE PROBLEM

In Northern Ghana [1], the construction of small scale irrigation schemes for all year round agricultural production has been a cardinal concern since colonial times

[1] "Northern Ghana" referred to throughout this paper comprises three political regions-Upper West, Upper East and Northern Region. These are all situated in the semi-arid Guinea and Sudan Savannah ecological Zones of Ghana.

Over the years, these small scale irrigation schemes have encountered a number of problems. A central problem has been the conflicts arising among community beneficiaries. Conflicts are common between different communities that share the same facility; and even within the same community, conflicts arise among community members over issues of access to more productive irrigable plots. Issues of contested land rights, catchment area management, access to irrigable plots and to other water resources like fish were the most frequent. These problems have arisen as a result of the fact that, the harnessing of streams for irrigation involves appropriating family, clan and community lands for the development of an irrigation scheme for public use by anyone living within the catchment area. This mode of appropriation of lands naturally causes ill feelings among the families, clans and communities that have lost their lands without adequate compensation, for the benefits of the entire community (Ghana, 1998).

Apart from the land conflicts, the issue of setting up an appropriate management system to manage the growing number of these community-based schemes have always posed a lot of challenges to all governments. The key management issues have revolved around the maintenance of the infrastructure itself, catchment area protection to prevent silting, the mobilisation of financial resources and the equitable distribution of irrigable land. The different community management committees put in place have always proved ineffective, as they neither have sufficient mandate to enforce compliance nor adequate motivation and resources to accomplish their tasks. They also run counter to the existing traditional authorities who have perceived them as usurpers of their authority (Ghana, 1998).

Given these intricate problems, most community irrigation schemes in Northern Ghana were virtually broken down and communities had to live with acute water shortage during the long dry season, lasting usually from November to May. To revamp these irrigation schemes, government decided in the 1980s to shift the burden of managing these schemes directly to the communities. Interestingly, the government did not attempt to directly address the problems relating to the definition of ownership boundaries. It was up to communities within each catchment area to come up with a way of identifying which communities qualify, who in each community qualifies to be a member and what type of management structure should be set up and the boundaries of their authority. The communities are at various stages of addressing these problems. This paper explores the mechanisms that are being used to address the critical issues of boundaries. The paper will attempt to address three interrelated questions, i.e. how do communities: (1) delimit the territoriality of their irrigation schemes? (2) define authority spheres within the context of the traditional land ownership system? (3) define the limits of each individual user within the context of competing users such that conflicts are minimized?

These questions are addressed using data derived from multiple sources. The major source is a large scale socio-economic survey covering twelve dam site communities

carried out in 2003. The information from this survey provided a broad overview of processes occurring within these water user groups and the dam site communities. A more focused study was then carried out in the three case study communities, using semi structured questionnaire, and focused group discussions to explore, in-dept, specific issues relating to issues of territorial, authority and user boundaries, group processes, the institutional setups and their operations, and issues of rights. Considerable amount of information was also obtained from secondary sources such as the appraisal reports, reports of missions, field officers' monthly, quarterly and annual reports from both the regional and district offices of MoFA. This triangulatory data collection approach proved useful in the unraveling of critical issues that could never have been obtained through the use of any one data collection instrument.

3. WATER USER ASSOCIATIONS UNDER COMMUNAL LAND OWN ERSHIP: CONTEXTUAL AND CONCEPTUAL ISSUES

3.1 Contextual Issues

Among the three political regions of Northern Ghana, – Upper West, Upper East and Northern - that constitute the savannah ecological zone of Ghana, the Upper East Region is ecologically more fragile. This region lies wholly within the semi-arid Sudan savannah belt, which experiences a mean annual rainfall of about 1,016 mm. The long spells of dry seasons and unreliable rainfalls have devastating effects on the people whose lives revolve around basically subsistence arable and livestock farming. The population growth rates in the last three decades show that the region's population has been increasing at an annual average of 2.6 percent (Ghana, 2000). With a current estimated population of 1,036,400 and a total land area of 8,800 km, it has a crude density of 117.8 persons per square kilometre. The high population densities, rural nature of the population, and over dependence on subsistent agriculture have resulted in small farm sizes. These range from 0.5 to 2.0 acres. About 48 per cent of farm households have less than 3.5 acres of land (Ghana, 1991). Irrigable land at the community dry season irrigation plots are much smaller and are between 0.3 to 1.0 acres. The interplay of these demographic and ecological conditions has made the region prone so much to severe food shortage.

Land shortage, apart from its direct impact on food production is also associated with other critical problems in this multi-ethnic region. Frequent land conflicts are one such set of problems. The land shortage also explains partially why it has been sometimes difficult for government to acquire land to develop infrastructure for public use, unless the people in a particular community see clear benefits accruing to them directly.

Apart from the problem of physical shortage, the communal aspect of land ownership makes land acquisition complicated. Individuals or families do not acquire and own land, in which case a group of farmers along a water course can agree to come to-

gether to pool their farm lands to develop their own irrigation system. Land is collectively owned by communities and vested in the Tendana [2], who invariably is chosen from the families of first settlers to act as the custodian of the communal lands. Land is allocated to the different families, who have the right of use as long as they remain in the community, but have no right to sell it or transfer it to other families without the knowledge of the Tendana. This means that each community has its land boundaries and each family in a community has a specific piece of land it can use as a member of the community.

3.2 Conceptual framework

Three levels of institutionalized boundaries, it is argued here, have the potential to minimize conflicts regarding the use of the water resources and the irrigable land among WUA members. These are explained in the ensuing sections.

3.2.1 Territorial Boundaries

Territoriality as both a concept and a fact of life is not only limited to humans. Even in the animal and plant kingdoms, segregated habitats are common natural features as these natural territorially defined habitats ensure a healthy population-environment relationships, the survival of all species, and forestall disastrous competition for survival. For human beings, independent existence requires that individuals have access to specific spaces they lay claim to and also as groups, the need to avoid conflicts with other competing groups for the same space. Territorial boundaries are important because they encompass resources that are of significance to the existence of a given group of people. The territorial boundaries are useful for the determination of the nature, quantity, and quality of given resource pools available to the individuals or groups that have legitimate right within the prescribed boundaries. It also means that the individuals or groups with the right to the resources within the prescribed territory will need to protect it or find ways of ensuring continuous supply if they must continue to enjoy these resources.

The concept of territorial boundaries as used in the context of the small scale irrigation schemes in this paper, thus, goes beyond the meaning of the physical land area covered by the irrigation infrastructure and related activities. It also means the jurisdictional area of the WUA and all the specific rules and regulations and institutional structures pertaining to the defined area, that bind all WUA members and which may not apply to the general community and/or any other WUA in a different territory. The concept of the territorial boundary in this sense also conveys a sense of belongingness to a specific operational area. The territorial boundaries also provide a framework for exclusion of non-members.

[2]Tendana (also spelled Tindana) is the traditional priest-king who is regarded as the custodian of the land and performs sacrifices related to land. He is usually from the family of the first settlers of the clan and in the olden days, had both spiritual and secular powers

3.2.2 Authority Boundaries

On the other hand, the concept of authority boundaries are used here to mean the specific powers of the Water Users Association to enable them to make decisions, enforce compliance and to sanction, without necessarily running into conflicts with the existing traditional institutions, such as the Tendana and chiefs, or formal institutions such as Unit Committee members, Assembly members or higher government authorities like the District Chief Executive[3]. Once clear authority boundaries are known, it thus means also that, the given authority is limited within a given jurisdiction. It also means that discussions and actions taken by the WUA within their authority boundaries are binding and legally acceptable. These authority boundaries in principle give the WUA ample room to operate without any undue encumbrances from other existing authority systems.

3.2.3 User Boundaries

The user boundaries as defined here encompass two things. First, it addresses the question of who or which individuals within the defined operational area can be a member of WUA given the set of rules and regulations that define membership. Secondly, it also determines, once an individual has become a member of a WUA, what will be the range of rights and responsibilities. The first relates to the problem of entry and exit (Bromley, 1992). Definite rules and regulations will need to be formulated to define criteria for membership, mode of entry, and also exclusion. By setting such collectively agreed upon rules that define membership or exclusion, an essential coordination problem is addressed as it will now be easier to identify who has the right to the use of the resource pool and who has not (Olson, 1965; Tang, 1992; Oakerson, 1992). User rights and responsibilities are, invariably, designed to ensure sustained appropriation of a common property resource (Tang, 1992).

Although the expectation is that the setting up of user boundaries will lead to predictable patterns of behaviours and interactions among the defined users, Oakerson (1992: 48) argues that, "rules, as everyone is aware, do not guarantee the emergence of a particular pattern of behaviour" as individuals calculate the risks and benefits associated with being a member of a collective group. While this argument is valid, the merit of defining user boundaries lies in the fact that it becomes easier to institutionalize effective self-monitoring. Besides, when each member is known by other members and patterns of behaviours are observed overtime it then becomes easier to craft problem specific rules for self-monitoring as an ongoing process (Olson, 1965; Vincent Ostrom, 1980).

[3]Unit Committee members, Assembly members and District Chief Executives are officials of the decentralized District Assembly system

4. INSTITUTIONALIZED BOUNDARIES FOR MANAGING COMMUNITY IRRIGATION SCHEMES: THREE SELECTED CASE STUDIES

In this section, we present the three empirical case study communities - Basyonde, Dorongo and Kaade. The Basyonde community is used to illustrate the territorial and user boundaries problem while the Dorongo community case study illustrates the authority boundary problem and how boundaries were negotiated in both cases. The Kaade, on the other hand is used to illustrate the consequence of the failure to define resource, authority and user boundaries in common pool resource situations.

4.1 Case I: Redefining Territorial and User Boundaries - Basyonde Water Users Association

4.1.1 Context

Basyonde community lies about fourteen kilometers east of Bawku, a vibrant commercial town and also capital of the Bawku East District Assembly. Although the indigenous ethnic group, the Kusasi, constitute the major ethnic groups in the community, there are other ethnic groups such as the Bimoba, Fulani and Hausa, mostly migrants who have settled there many generations back. These different ethnic groups make up the seven sections of Basyonde; i.e. Basyonde Central, Sabzurde, Kongo, Karateshie, Kpalsako, Naganii and Mamobori. In terms of the socio-political organization, the chief and Tendana are the main traditional heads of the place. The Tendana's role in relation to land is more spiritual. He is regarded as the custodian of the land while the chief is the political head of the community. He rules the people and mobilizes them for community development.

Basyonde is primarily a farming community. Men and women engage in the cultivation of one type of crop or another for cash and food. During the rainy season, they cultivate both their compound and bush farms. Crops cultivated on these fields include millet (early and late varieties), maize, sorghum, groundnut, rice, soybeans, cowpeas and other crops cultivated on very small scale (less than 0.5 acre). In the dry season, majority of the people engage in dry season gardening. Dry season gardening is undertaken by both men and women. They obtain water from the dam, the 27 boreholes, 14 hand-dug wells and also seasonal dugouts.They also travel to neighbouring communities where there are dugouts to obtain land to do dry season gardens. Crops cultivated in the dry season are onions, tomatoes, okro (okra), cabbage, carrot and other leafy vegetables. Onions are an important cash crop in the area, which is also the source of income for households. It is an export crop marketed in other parts of the country. Fishing is also a part-time minor activity in the dry season and fishermen here use cross and cast nets, as well as hook and line during the fishing season. Livestock rearing is also an important activity, as livestock serves multiple economic and social purposes.

It is in the context of all the above economic activities that the small dam is viewed as a critical source of livelihood in Basyonde both by the people and government. Unfortunately, since the construction of the dam during the colonial period its maintenance and use have been fraught with problems due to the conflicts between the various ethnic groups in the community. Why these conflicts are persisting and how the WUA is addressing them are discussed in the ensuing section. The study revealed that the reservoir and catchment area of the dam is at Kongo, a section of Basyonde where the inhabitants are mostly settlers who migrated into the area several generations back and were accommodated and given land in accordance with the traditional communal land ownership system. Kongo is thus a mixed group of people comprising the Bimoba, Hausa, Fulani, and some few Kusasi. The irrigable area on the other hand is mostly in Basyonde Central where the inhabitants are mostly Kusasi, who claim to be the indigenes. What this means is that the settlers whose lands have been taken up by the reservoir and catchment area have no lands to farm, while those whose lands are located at the irrigable side feel the lands are for them because they were allocated to their families and, besides, they are the indigenous people. This situation has resulted in non cooperation over the years and is sometimes expressed in open conflict. Besides, the pervasive feelings of "settler" versus "indigenes" have tended to worsen the conflict. An argument is usually made that the settlers could go back to their areas of origin. Practically, however, this is not feasible since most people born in Basyonde no longer regard themselves as visitors.

This struggle between the two sections regarding the need to redefine new land boundaries and user rights of access to the irrigable area seriously affected the sustainable management of the Basyonde dam in the past. Unfortunately, central government institutions responsible for supervising the management of the small scale dams were not aware of these intricacies and concentrated their efforts on technical and administrative issues of rehabilitation, and setting up different types of committees to management the dam. The community however is very much aware of the problems emanating from the diverse interests of landowners and farmers, which have always sparked conflicts. To address these problems, the community went through a participatory process with the assistance of the District staff of the Ministry of Food and Agriculture and the Department of cooperatives. Through these participatory meetings involving the seven sections of the Basyonde community, the Basyonde Water User Association (WUA) was formed. The legal ownership of the dam was then passed over by the government to the WUA which is a representative body democratically constituted by all the eight sections. The territorial boundary of the irrigation scheme thus encompasses all the seven sections and not just Basyonde Centrol or farmers whose lands have been taken by either the reservoir or irrigable portion or catchment area. This means the area covered by the reservoir, catchment area and the irrigable area, in principle is owned by the WUA, and therefore free from the traditional control. Apart from the physical territorial boundaries, the WUA's authority was also limited to issues pertaining to the dam, irrigable lands, catchment area and organization of its members. The clear definition of territorial boundary of the dam

gave the WUA, representing the seven sections to set about their task of addressing conflicts, institutionalizing self-governance and management. The difficulty, however, was what to do with the numerous farmers currently farming permanently during the rainy season on the irrigable lands and the "settler" farmers who also lost their farmlands in the reservoir area. Due to the land shortage in Basyonde, the WUA and the community reached an agreement that since irrigation farming was restricted to only the dry season, the original owners of the irrigable area could still be allowed to farm their plots during the rainy season and then turn them over to the WUA for reallocation during the dry season to its members. This provision in the arrangement entails some system of rotation of irrigable land ownership between the original owners of farmlands and the WUA. Unfortunately, this decision generated another problem. Those community members in Kongo, whose lands are taken up by the reservoir and catchment area, wanted to know how they could also be compensated during the rainy season when they have no land to farm. This demand has proved to be difficult to address, since land is generally short. However, the community is planning a resettlement for the affected members and also working towards some agreed upon solution.

4.1.2 Institutionalizing Self-Governance and Management

Once the critical issues of territorial and user boundaries where defined, it gave the WUA, the legitimate framework to institutionalize the modus operandi for governing group processes and managing the scheme to ensure that conflicts are resolved to optimize benefits from the scheme. Here we discuss the basic self-governance framework and the management procedures institutionalized and the outcomes.

The WUA, which comprised three-sub associations, namely: livestock farmers; gardeners and the fisher folk were drawn from all the seven sections. Three important criteria were used to define the WUA membership. To qualify as a member, you need to belong to the Basyonde community, pay the WUA membership registration fees and water levies, and also participate in all activities of the WUA. At the time of the field studies in April 2002, the total membership was 312, comprising 228 males and 84 females in the association. In terms of occupational groupings, it is made up of 100 gardeners, 200 livestock owners and 12 fisher folk.

With regard to the plot allocations on the irrigable land, there are clear rules and regulations that seek to define clear boundaries for each member. The irrigable land is divided into plots and allocated to members on a first paid first served principle. The membership registration fee of ¢20,000 and the annual water levy are used to compile the list of beneficiaries. Members who meet their financial commitments but fail to participate in the WUA activities such as meetings, communal labour such as cleaning and mending canals, catchment area protection can be sanctioned when it comes to distributing the plots. This means that if one is not a member of the WUA, there is no way he/she will access an irrigable plot.

The institutionalized ownership by the WUA, the defined territorial limits and user boundaries have all contributed to minimize the conflicts among the competing interest groups. From past experience also, the WUA is now aware that the dam will need to be maintained. The WUA has, therefore, put in place measures to ensure the long term sustainability.

Despite these measures there are still some issues that the WUA will need to address. One such issue is the lingering feeling by the original landlords that their family lands belong to them. Another problem has to do with the sustainable use of land since the same piece of land will be cultivated throughout the year for many years to come. There will be the need for the WUA to workout a land conservation scheme to ensure that both the rainy season and dry season farmers use land in a sustainable way. The issue of the resettlement, or some form of compensation, for the Kongo section of the community whose farmlands have been swallowed by the reservoir and catchment area will also need to be addressed speedily.

4.2 Case II: Redefining Ownership and Authority Boundaries - Dorongo WUA

4.2.1 Context

Dorongo is a peri-urban community located near Bolgatanga, capital of the Upper East Region and the largest market centre in the region. This strategic proximity is advantageous to the people of Dorongo since one can get to Bolgatanga on foot, donkey cart, or bicycle with perishable produce like vegetables in a short time. The production system of this community is much similar to Basyonde and other communities in the Upper East Region as a whole and will not, therefore, be repeated. Emphasis will be placed on the socio-political organization since that is what will shape the discussion centered on the WUA in this community.

The community is made up of people from the same ethnic group, the Grune speaking people, often referred to as Frafra. There are five (5) clans: Agobigabisi; Aguabisi; Abongabisi; Avorobis; and Kobulingobisi. Each of these clans lives in a different section of the community. In terms of the traditional authority, a chief, who is assisted by a group of elders, rules the community. Another important socio-political feature of the community is the Tendana, who has custodial responsibilities over the community's lands and earth shrines. These together constitute the traditional authority structure. The unit committee, which is part of the Municipal Assembly structure of the formal administrative system, plays a crucial part in community mobilization. There are also other community based organizations such as the Women's Income Generating Groups, Christian Mothers Association, Farmers Group among others.

Due to their proximity to Bolgatanga market and the high demand for vegetables, dry

season gardening has always been an important part of their livelihood. Before the construction of the dam, the people were relying on water from temporary hand dug shallow wells to water their dry season gardens. In 1963, the chief requested the government to provide a dam, and it was constructed for the community's use. The processes leading to the construction of the dam involved the chief and his elders. The area of land inundated by the reservoir belongs to the chief, who freely offered it for the construction of the dam. Other people who also lost land to the reservoir emulated the chief's example and did not demand compensation. The irrigable portion is, however, limited. Throughout the years, the practice has been that those dry season gardeners, who want to make gardens, follow the traditional land acquisition procedure of requesting the use of a piece of land from those who have usufruct rights to irrigable lands. When the family with the right of use of the requested land agrees to release part of his land, the next stage is to ask the Tendana, who has the ultimate say in traditional land matters for approval. This means that, although the dam was regarded as a property of the whole community, it was actually not the case in practice. The chief also had a major say because apart from being the secular traditional leader, he gave his lands and also played an important role in the construction of the dam. Access to irrigable land during the dry season depended very much on ones ability to negotiate with the chief and other landowners and also meeting the demands. This prevailing local situation, coupled with governments attempt to control and manage these small scale dams affected the sustainability of the scheme in Dorongo. Less than ten years after the construction, the dam wall broke resulting in the lost of water. Farmers continue to cultivate within the catchment area resulting in further silting and lost of water. The community was not enthusiastic about the maintenance of the dam as they did not see any clear benefit from a dam that they did not own in practice. The introduction of the WUA concept was, therefore, a major relieve to the community. The need to redefine authority boundaries under the WUA was compelling.

4.2.2 Institutionalizing self-governance and management

The problem in the Dorongo case was not one of conflict, but how to get around the existing powerful traditional authority system to gain control over a vital resource that was controlled by the chief and his elders. Through negotiations and community sensitization processes organized by the Ministry of Agriculture and the Department of cooperatives, the chief and his elders came to terms with the WUA concept and relinquished the management of the dam to the WUA. The ownership system and authority boundaries were restructured to reflect the new situation.

With the formation of the Water Users Association (WUA) the tenurial system has become more defined. The original owners of farmlands in the irrigable portions of the dam cultivate during the rainy season and then turn their farmlands over to the WUA during the dry season for redistribution to WUA members, after which the plots revert to their original owners during the wet season. This arrangement is to ensure that people have access to land for both the staple food cultivation and as well

as the mostly commercial dry season small-scale irrigation farming. The authority of the WUA is only limited to the management of water, catchment area and irrigable plot only in the dry season when these plots are turned over to them. All else with regards to land issues still remain the exclusive preserve of the Tendana and the families that have been allotted usufruct rights. The advantages of the Dorongo community are the fact that all the clans come from the same ethnic group and the chief is supportive of community development endeavors. These two critical factors account for the easy switch of authority from the chief to the Water User's Association.

As a result of the restructured WUA management, 132 community members have registered as dry season irrigation farmers, comprising 82 men and 50 women. The WUA has also been able to generate revenue through its membership registration fees and water levies amounting to over two million cedis (¢ 2,000,000.00). The association has a seven-member executive committee, comprising: Chairman; Vice-Chairman; Secretary; Treasurer; Vice-Treasurer; Trustees (2). Members of the executive committee were elected during a general meeting of the association. The committee is responsible for the general managemt of the dam facility and the implementation of the association's decisions. The executive officers have been selected from the five (5) identified clans of the community. The association also has a three-member maintenance subcommittee, and its main duty is to ensure the maintenance of the reservoir and its catchment area, the canals, embankment, among others. Major decisions are taken during general meetings, which normally involve both sexes. However, the executive committee may take minor decisions relating to the day-to-day management.

4.2.3 Land and Water Management

Some rules and regulations have been formulated to govern members of the association. Rules regarding farming in the catchment area, meetings , functions and powers of the executive, safety around the dam reservoir area, membership obligations and benefits and sanctions are spelled out.

The distribution of irrigable plots and management of water are some of the difficult tasks of the WUA. Although the rule is that members of the WUA receive equal treatment with regard to the sharing of land, those who have made some special sacrifice by giving up their farmlands for the benefit of the entire community are compensated. Such people are allotted larger plots of 1.0 acre as against 0.2-0.5 acres for all other WUA members. As a rule, access is guaranteed through the payment of WUA membership fees and the participation in other WUA activities. So, irrespective of one's age and sex, once these basic conditions are fulfilled each member has equal rights and entitlements.

The main source of revenue for the association is the payment of membership registration fees and dues. Each water user is expected to pay dues. During harvesting, when tomatoes are being sold to market women, the treasurer goes round to collect

the dues. This arrangement makes it difficult for members to default. The association has so far lodged about ¢2 million in a bank account at the Agricultural Development Bank in Bolgatanga. Three (3) signatories operate the account. Any of the signatories can pay money into the account, but at least two (2) of the signatories are required for any intended cash withdrawal. The income so generated is applied in the maintenance of the dam. When the water valve requires replacement, it is bought with money from the income generated. The maintenance committee carries out the operations and maintenance of the dam. The committee schedules the supply of water to the plots. The community and the Ministry of Food and Agriculture (MoFA) carry out routine maintenance of the dam. In order to ensure the sustainability of the dam, the WUA and the Unit Committee has the responsibility to protect the catchment area of the dam. As at the time of the study, the association, with the support of MoFA, was undertaking a major expansion and rehabilitation work. The association also planned to plant trees and grasses around the catchment area of the dam to avoid silting.

4.3 Case III: Working Without Institutionalized Boundaries – The Kaade WUA

4.3.1 Context

Kaade is a poor subsistence farming community in the Bawku East District of the Upper East Region with less than 500 inhabitants. It is surrounded by other smaller and equally poor communities. Fortunately, Kaade and its neighbours are lucky to have an extensive valley that offers a lot of opportunities for dry season gardening, unlike many other communities in the District and/ or Region. This potential is one reason for the government's decision in the 1960s to provide a small scale earth dam, for both livestock watering and dry season irrigation farming for the inhabitants. Like most other such dams elsewhere, it suffered neglect and the embankment gave way, resulting in the lost of water for many years back. With the lost of the water from the dam, livestock watering and water for both domestic and economic purposes became a critical problem. This problem stems from the fact that although the people of Kaade and its neighbours belong to the Kusasi ethnic group, each village community is, by the traditional authority setup, independent in the sense that each has its traditional chief and Tendana. This means that all the villages within the catchment area of the irrigation scheme will need to come to some consensus. Also, there must be some agreement among the different Tendanas to release land for the purpose, just as it will be important for families with usufruct rights whose lands are affected by the irrigation scheme to sacrifice their lands for a scheme that all other community members will have access to for the production of higher value crops for the market. Unfortunately, there has not been such an agreement to define clearly which communities own the dam and the exact boundaries of the irrigation scheme. The absence of defined territorial boundaries has serious implications for land acquisition for the dry season irrigation farming since both the reservoir, catchment area and potential irrigable land stretches across the boundaries of different communities and the different

Tendanas are not sure of the implications of handing over their lands for the purposes of general use. For the farmers with usufruct rights to lands within the irrigable area, there was no logic in handing over their farmlands to farmers from different communities.

4.3.2 Institutionalizing Self-Governance and Management without Defined Boundaries

Under the new management strategy of relinquishing the dams to the WUAs to manage, Kaade's dam was also handed over to the communities within what the Ministry of Food and Agriculture (MoFA) defined as the catchment area. Through the initial sensitization processes by the team from the District Agricultural Office in Bawku, the Department of cooperatives and other local NGOs, Kaade community came up with a WUA to fulfill the requirements for the government to hand over the dam to the WUA, like in other dam site communities. ZOVFA, a local NGO promoting organic farming in the District, also provided supplementary training on group dynamics and management, financial management and records keeping, compost making, storage and use.

The executive committee was also formed, comprising mainly people from Kaade excluding other beneficiary neighbouring communities, although their lands have also been taken up by the dam. The excluded communities have also, since the construction of the dam in the 1960s, been watering their livestock from the same dam. These neighbouring communities, who are not represented in the WUA executive, are also desirous of participating in the dry season gardening. The chairman of the WUA lives and works about 20 kilometres outside the community in Bawku, the district capital. He comes to Kaade when there is the need for him to call a meeting, to meet with visitors or to solve a problem. With regard to the WUA membership, it is not clear which community members actually constitute the WUA as there are no clear criteria or stipulated rules governing entry and exit. Since there has not been consensus among the different Chiefs, Tendanas and community members from all the villages, the WUA executive which comes from only Kaade, it has become obvious that the different Chiefs and Tendanas would not agree to let go their authority in a project that they don't have a stake. The WUA committee with some assistance of the Chief of Kaade tried mobilizing the Kaade community, but this proved difficult as the community members did not see any wisdom in devoting their energy and resources to maintain a dam that the other surrounding communities will use freely to water their livestock and also fish and irrigate their plots since one can not prevent the water from flowing into these communities. The whole concept of the WUA as explained during the sensitization processes and how it is being handled by the executive is very confusing to most community members. These ambiguities about ownership, territorial, authority and user boundaries and the accompanying rights and responsibilities have created serious problems for community mobilization resulting in the unfortunate situation of very low community spirit.

Apart from these boundary issues, the mismanagement of the WUA executive itself

was a source of dissatisfaction to the few farmers who were still bent on setting up the scheme. At the institutional level in even Kaade, it is not clear, between the village chief, the Tendana and the WUA chairman, who has the ultimate decision-making power. Neither the Chief, nor the Tendana nor WUA chairman wields enough power or influence to mobilize the rather dissatisfied and non-cooperative community members in Kaade and its environs to sustain the dam. The WUA executive finds it hard to organize meetings to discuss up-coming problems about the dam, since the executive is unable to render accounts of the initial contributions. The rumours that the WUA executive has misappropriated the funds have spread beyond Kaade to the other communities. In sum, the Kaade WUA, unlike the other two cases presented earlier is not working as a result of unclear boundaries.

5. Conclusion

The emerging evidence from the three case study communities show that despite the confounding challenges, the paradigm of self-governance and management has some promise in addressing the complex problems associated with the internal group processes and the managerial problems facing the schemes themselves. An outstanding prospect is the high economic value of water for livestock watering, the cultivation of high value market crops such as tomatoes, onions, rice and other vegetables. At the institutional level, community groups are crafting appropriate rules, incentive systems, and management procedures to address the complex up coming problems. The democratic procedures employed to constitute WUA executives, the membership association and the allocation of land and water all point to the likely successes of these schemes. The intricate rotational land ownership system has minimized conflicts a great deal, as shown in the case of the multi-ethnic WUA of Basyonde community. The difficulties experienced by Kaade community which is attempting to operate without clear boundaries, institutionalize self-governance and management procedures reinforce the argument that, those WUAs who have already defined boundaries and institutionalized procedures have greater prospects for survival.These prospects notwithstanding, there a challenges. While the Dorongo and Basyonde cases demonstrate some hopes for these self-managed schemes, the fragile Kaade example epitomizes the confounding challenges facing these schemes.

On the basis of the evidence, it can be concluded where community groups are sufficiently sensitized they organize and manage their own resources on a sustainable. There is the need for all stakeholders, especially the Ministry of Agriculture to continue to support these WUAs.

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