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International Journal of Current Research
Vol. 3, Issue, 8, pp.123-127, August, 2011

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

ISSN: 0975-833X

RESEARCH ARTICLE

CLIMATE CHANGE AND WATER RESOURCE GOVERNANCE CHALLENGES IN RURAL KENYA

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ARTICLE INFO

Article History:
Received 18th May, 2011
Received in revised form
27th June, 2011
Accepted 25th July, 2011
Published online 5th August, 2011

Key words:
Climate change,
Governance,
Human activity,
Sustainability,
Water.

ABSTRACT

The UN Millennium Goal (MDG) 7 aims to ensure environmental sustainability, with some of its targets being halving the proportion of people without access to safe water and reversing loss of environmental resources by 2015. Although challenges exist for developing countries like Kenya in this endeavor including climate change, financial scarcity and impropriety, impressive progress is feasible with workable checks in natural resource exploitation. For example, actively engaging all stakeholders in implementing UN Agenda 21 is important in this regard. Indeed, the need for its decisive implementation has become more urgent now than ever before owing to climate change that has seen once perennial rivers becoming seasonal. In turn, this has led to significant water scarcity and drought, taxing animal and crop husbandry, with adverse health and socio-economic consequences in most of Sub-Saharan Africa. In addition, human activities including wood and sand harvesting, quarrying, charcoal burning, forest cultivation, casual use of pesticides and other chemicals have not only increased water scarcity, but also appreciably polluted it. It is on the basis of this backdrop that a study was carried out to determine the level of stakeholder engagement, governance challenges and lessons learned in initiating a water dam project in Taita District, Kenya. The study employed qualitative methods of data collection including desk research, key informant interviews, focus group discussions, photography, direct observation and life history accounts. This paper presents the findings of the study which include marked stakeholder de-participation and missing governance plan and thereafter suggest their deliberate reversal through strategic decision-making, governance and sustainable use of water in rural Kenya.

INTRODUCTION

Africa is under pressure from climate stresses and is highly vulnerable to the impacts of climate change. Many areas in Africa are recognized as having climates that are among the most variable in the world on seasonal and decadal time scales (UN, 2007). Floods and droughts can occur in the same area within months of each other. These events can lead to famine and widespread disruption of socio-economic well-being. Kenya which is 80% arid or semi-arid is a water-scarce country and faces serious difficulties in making safe water available to its people (Republic of Kenya, 2007; 2008). Indeed, Kenya's renewable water per capita is 647m³ against the United Nations recommended minimum of 1000m³ (Republic of Kenya, 2008). This is unfavorably comparable with Uganda and Tanzania which have 2940m³ and 2696m³ respectively. The per capita fresh water in Kenya is declining and it is projected to reach a low of 235m³ by 2025 in the absence of deliberate measures to reverse the trend (Republic of Kenya 2007; 2008). Nonetheless, there are regional variations regarding access to safe water with some regions having excess of it while in others it remains grossly scarce. For example, in some urban areas such as Eldoret Town in the Rift Valley province, only 40% of the available water is used. It may perhaps be appropriate to seek means of *exporting* it to nearby water-scarce areas. That notwithstanding, the existing water sources including rivers, lakes, springs and boreholes among others are not exhaustively exploited for sustainable water supply. In addition, water quality monitoring by the relevant government departments is inadequate and much of the fresh water is not fit for human consumption. Consequently, 80% of communicable diseases in Kenya are water-related and hence eat a considerable chunk of the health care budgetary allocation from the central government (Republic of Kenya, 2008). As a result, there is high

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probability that the country is unlikely to meet her water commitments by 2015 in line with the UN Millennium Development Goal 7. The provision and management of water in Kenya is placed under the armpit of public and private stakeholders with the government taking overall responsibility. Even then, the stakeholders have not ensured its provision in reliable proportions, leaving about half of the population with no access to safe water (Republic of Kenya, 2002c; 2007). Hence, in the Kenya Vision 2030 (Republic of Kenya, 2007; 2008) the government proposes measures towards devolving water management to communities and the private sector in line with the Millennium Development Goal of halving the proportion of the poor without access to safe water by 2015 (Mcgrahan and Scattethwaite, 2006). It is noted that poor governance has excluded much of the population from management and hence access to safe water. However, even with several measures, the situation is worsening as more people have no access to safe drinking water. For example, in 1999, only 31% of Kenyan households had access to piped water as compared to 32% in 1989 (Republic of Kenya, 2002b). Indeed, nationally, 45.1% of the people had no access to safe drinking water in 2003, with an apparent urban bias (Republic of Kenya, 2002a; 2007; 2008). This leads to development imbalances since access to water is a principal welfare indicator. For example, inadequate rainfall means low crop yields, low school enrolment and increased human morbidity and mortality. Since over 80% of the country's population is employed in agriculture, with a larger number depending on natural rainfall, inadequate water remains a key setback to development in Kenya.

The Study Site

The study was undertaken in Mengo Sublocation[1] of Kishamba Location, Mwatate Division in Taita District, one of the twelve districts making Coast Province. The sublocation is semi-arid and hence of low agricultural potential, with famine being a frequent phenomenon (Republic of Kenya, 2002a; 2008). It covers an area of 37.8km², has a population of about 1,481 people clustered in 379 households and a population density of 39 people per km². Inhabited by the Taita ethnic group, crop farming and livestock rearing are practiced mainly for subsistence. Crops grown include sisal, maize, cowpeas, sorghum, millet, kales and coconut, while cattle, shoats and poultry are kept. In addition, locals do casual work in sisal plantations, petty trade and formal employment. Due to low levels of literacy and hence poor returns to labour, many households barely meet their basic needs. Sources of water include rivers, roof catchments, wells, boreholes and springs that are highly vulnerable to contamination owing to poor governance regimes and paucity of the relevant central government and local authority[2] extension officials. In particular, River Voi, on which the water dam was to be constructed, which is the main source of water was seen as the most vulnerable to pollution as discussed later. It has Taita in Wundanyi and Kungu Hills in Mgange to the west of Mengo Sublocation as its major and minor catchments respectively. Three main tributaries feed the river: one from Kigombo joins it at Torienyi with a second one from Bagau joining it at Msau. The third tributary originating from Nyache joins the river at Nganga. Fig. 1 shows Taita Hills, one of the catchment areas of River Voi.

Fig. 1: Taita Hills in the background, part of River Voi catchment area
(Photograph 1: A view of Taita Hills in the far background, the River Voi catchment area. Note the wide *Korongo* (dry valley) in the middle background where the community proposed water dams to be built)

Needs Assessment

The study area is largely semi-arid and has River Voi as the main source of water for domestic, livestock and crop husbandry. While natural rainfall plays a significant role in the area, it is erratic and hence largely unreliable. As such this leaves River Voi as the main source of water. However, intensive hillside agriculture in both Taita and Kungu hills coupled with other vagaries of climate change have rendered the once perennial Voi River seasonal to the disadvantage of the local community. In the district, 72% of households use firewood and charcoal as fuel, depleting forest cover (Republic of Kenya, 2001b). Hillside agriculture at the catchments area and dry spells, reduce the ability of the soil to retain water for meaningful agriculture. Indeed, due to intensive hillside agriculture, deforestation, poor soil conservation practices and the impact of climate change variability, the once perennial River Voi has in the last fifteen years become seasonal.

The foregoing has made water in the study site not only inadequate, but also highly polluted. Compounding the foregoing is the fact only 12% of land is suitable for rain-fed agriculture, 74% of which is low potential. Hence food insecurity is inevitable and therefore a common phenomenon in the study area. This necessitated the formulation of deliberate strategies to ensure sustainable availability of water. To do this and retain water for crop and domestic use throughout the year, it was deemed necessary to build a water dam across River Voi in Kishamba Location, Mwatate Division of Taita Taveta District. The river as mentioned earlier has both Taita and Kungu Hills as its catchments area. The aim of this study was to determine the stakeholder participation in the water dam construction, the governance regimes in place to manage the utilization of water resources in the midst of climate variability. The study employed qualitative methods of social investigation including focus groups discussions, key informant interviews, community meetings, observation life history accounts and documentary review. The information was obtained from community members, key government officials, community leaders and the relevant documents concerning the study area and problem. Unfortunately, it was not possible to interview the agency/donor technical staff who had since withdrawn from the site.

[1] Lowest level of central government bureaucratic structure
[2] Regional government with devolved powers to collect tax and provide services in designated areas

Community Assessment and Stakeholder Analysis

In the Mengo Water Dam project the stakeholders included the ministries of Agriculture, Health, Water and Irrigation, Environment, local community and the funding agency's technical staff. With reference to the proposed water dam project, the community had elected a committee, which oversaw the collection of locally available construction materials. However, the general impression was that the local community was informed rather than consulted concerning the water dam construction and more so the proposed site along River Voi. Indeed, residents of Rong'e-Nyika side of the river had not been consulted on the proposed dam and were therefore not participating in communal work.

Moreover, key stakeholders were out of the picture including government departments in charge of water and public health who informed the study team that they were not consulted concerning the water project. The omission of the Ministry of Water and Irrigation in particular contravened the Water Act of 2002, which prohibits obstruction of a waterway without legal approval from the relevant government department. In addition, the community members reported that the technical staff had withdrawn the tools they had previously given them, thus, disillusioning and making them sceptical of development agents. Table 1 is a stakeholder matrix for the water dam project as conceived by the study team. It is observed that participation of all stakeholders was crucial for the success of the water project, although this was not the case. In this regard, community members were unanimous that the water dam was likely to pose more problems than good. For example, the height of the riverbanks on River Voi at the proposed site was approximately one meter. Floodwater would hence make its way through farmland destroying crops and causing soil erosion. Such has implications of lowering farm productivity, food insecurity and related adverse effects on locals.

Community Expectations and Concerns about the Project

The community had various and varied expectations of the water dam project. On one hand, the area Assistant Chief was of the opinion that the proposed dam would go a long way in minimizing floodwater speed and therefore prevent soil erosion in the farms along the riverbank. In addition, the dam was seen as important in retaining water when the water table would be raised after the construction of the dam. This was seen as important to enhance irrigation-based agricultural production, particularly horticulture. On the other hand, during the meetings, community members were unanimous that although the water dam may retain water for irrigation-based agriculture, it may lead to massive soil erosion and wanton destruction of crops including coconut and bananas during what they called *wakati wa maji ya kitaita* (in case of heavy rainfall in Taita Hills) as shown in Fig. 2. The research team bought the community argument given the height of the riverbanks on River Voi at the proposed water dam site between Mengo and Rong'e-Nyika sublocations. The height difference between the riverbed and the adjacent farms at the proposed water dam site was approximately one meter. This meant a dam wall of one meter would be at the same level with the farms. In essence, this means during heavy rainfall, floodwater would make its way through farmland leading to unprecedented destruction of crop and as the community argued, accompanied by massive soil erosion. This is likely to lead to lower productivity of the farms, famine and eventually hunger and starvation. In essence, the long term result of these would be low school participation, poor health and breaking of the societal social bond.

Fig. 2: The proposed dam site on River Voi
(The site of the proposed water dam and a section of Taita Hills on the far background. Note the height of the riverbanks and crops (bananas) in the adjacent farms that were likely to be destroyed in case of floods when the dam is finally constructed)

Table 1: Stakeholder matrix for the proposed water dam in Mengo Sublocation

Stakeholders	Interests	Project impact
Mengo community	-Stop relying on Rong'e-Nyika water project -Get own water for domestic use	+
Rong'e-Nyika community	-Not known, were not participating	Not known
Ministry of Agriculture	-Help farmers to prevent soil erosion -Educate farmers on use of pesticides	+
Ministry of Water and Irrigation	-Gauge hydro-geological suitability of the site -Ensure legal requirements are adhered to	+
Ministry of Environment	-Help people prevent soil erosion -Help people in planting tree seedlings	+
Local farmers	-Increase irrigation-based agricultural production -Get water for domestic use	+
Farm owners on dam site	-Get water for irrigation-based agriculture -Ensure no encroachment on their land	+ or -
Provincial Administration	-Ensure people get water -Mobilize people for community work	+
Agency Technical Staff	-Provide water for community -Provide and control use of resources	+
Politicians	-Gain political capital -Use it to discredit ponents	+ or -

Source: Study Team, 2005.

Water Sources, Governance Regimes and Challenges

There were several water sources in the study area although management as we shall see later was grossly wanting. The sources were both natural and made-made including piped water from the Rong'e-Nyika Water Project, River Voi, roof catchments and wells, although some of them were seasonal and therefore unreliable especially during dry spells. For each of these sources the community had governance regimes to ensure equity in access to safe water not only for household consumption but also animal and crop husbandry. As it was evident in community meetings and focus groups discussions

though, the fitness of the water for human consumption was not highly regarded. The local community had constituted a committee that managed the Rong'e-Nyika Water Project, with the role of maintaining the project facilities. It drew membership across Kishamba and Rong'e locations, with grassroots government officials comprised its ex-officio members. The latter was particularly in the positive direction, as their active involvement would defeat the idea of participatory governance and devolution. To ensure all individuals had equal access to the piped water, the community members had instituted regulations, which included mandatory monthly contribution from each household for the maintenance of physical facilities. Nonetheless, use of the finances remained wanting. For example, the committee could not furnish the study team with expenditure break down since its inception due poor record keeping, largely based on human memory.

Natural water sources had governance regimes to protect their contamination. As such, cattle watering points were clearly demarcated, although this was not infallible, threatening the water with contamination. For example, the source of piped water in Tausa Division was normally contaminated by individuals through washing clothes and bathing. At the point where the water pipeline crossed River Voi, floodwaters broke and clogged the pipes with dirt thus contaminating it. In addition, River Voi water was highly vulnerable to contamination since pit latrines were concentrated uphill on both sides of the river. This implied that human waste could percolate into the river and contaminate the water. In addition, watering cattle in the river meant contamination of the water by their droppings. Also, horticultural farms were concentrated along River Voi and the use of pesticides meant that they contaminated the water when washed into the river by surface run-off. Incidentally, a local farmer reported that they cleaned their pesticide-spraying equipments in the river. Moreover, roof-harvested water was not any safe since dust was washed into water tanks thus contamination. Surprisingly, while identifying these risks to water contamination, villagers were ill-prepared to take simple preventive measures such as boiling drinking water. During community meetings and focus group discussions, villagers reported they did not treat water in any way irrespective of the source, regarding it as unnecessary waste of time. One local village headman captured it thus,

> Ni vipi utakaa kuchemsha maji huku shamba lako likikungonjea? Tumekuwa tukiyanywa vivyo hiyo na maisha hayajakoma kuendelea. Hata ukiyachemsha leo kesho hivyo tena? (How on earth can you sit boiling water at the expense of the farm? We have been taking it that way and life has never stopped. Even if you boil it today, for how long will you keep doing that?)

It is important to mention that the village elders are mainly opinion leaders and their counsel is taken seriously among the Taita ethnic group just like among many other ethnic groups in Kenya. Consequently, public health extension officers have an uphill task convincing people in this community to observe simple hygiene against the opinion of their local leaders. It is observed that when the health of a people is in jeopardy, development is greatly compromised. Apparently, the villagers did not appreciate the loss of production time as they sought healthcare consequent of consuming contaminated water. Concerning the suitability of the project site, community members preferred a rocky riverbed that would form a firm base to guard against the possibility of destruction of the dam by floodwater. In this regard, there was inadequate consultation among stakeholders concerning the site and the project itself. In particular, Ministry of Water and Irrigation was completely out of the picture, hence contravening the Water Act (Cap. 372, Laws of Kenya) that regulates the utilization of water resources. Specifically, Section 36 (2) of the Act prohibits obstruction of a water course unless authorized by the government ministry in charge of water resources.

Moreover, the construction of the dam would in effect convert the adjacent farmlands into public land without compensation as provided for in law. Most important, it meant encroachment on private land on both sides of the river, whose owners had neither been adequately consulted. They are therefore likely to deny the villagers its use by pleading trespass, putting the future of the dam into doubt. More importantly, it would only benefit the people whose farms were along the river to the inconvenience of others. Above all, its construction would lead to soil erosion and crop destruction in adjacent farms by floodwater among other effects (see photograph 2). Due to these bottlenecks, the water dam project was abandoned even after the community had invested heavily in it.

Lessons learned, Conclusions and Recommendations

It is apparent that poor water harvesting and use rather than scarcity per se was the problem in the study area. Whereas there were several sources of water, their utilization and management fell short of expectations leading to scarcity and contamination. As such there is need to institute viable governance structures in the use of the river resources including water and sand that would effectively guard against contamination, environmental degradation and possible wastage. The purpose of the proposed dam was not clear to the community due to the top-down development approach employed by the technical staff that led to lukewarm participation by the community. Consequently, more inclusive consultation and sensitization is needed to enable the community and other stakeholders understand the process and actively make informed decisions. The selection of the site and determination of its hydro-geological suitability should have emanated from expert advice in consultation with the community. Hence, a prior study is necessary to determine the suitability of the site and the possible advance effects of the dam construction like soil erosion, crop destruction, breeding of mosqutoes and the possibility of the dam being swept by floodwaters. Monitoring the quality of water used by the community was unimpressive, especially with the departments of Public Health and Water being left out. Consequently, the extension service delivery of the departments needs to be much more proactive and responsive to community needs by sensitizing it on importance of preventive measures like boiling drinking water. The catchments area of the river is a dissected hilly plateau, which has implications for future problems like massive soil erosion and water contamination due to extensive hillside farming and use of agricultural pesticides. Thus, a concerted and continuous farmer sensitization on the use of farming techniques that help prevent soil erosion and instill practices that ensure proper use and disposal of agricultural chemicals is highly recommended. Related to the foregoing, the proposed single dam was not

adequate to reduce the speed of surface run-off. This point to the need to construct more dams along the river to reduce the speed of surface run-off, prevent soil erosion and retain water for use during the dry spells. This should be done bearing in mind the water needs of lower riparians and the relevant law. Lacking in the project was viable sustainability and governance strategies to ensure continued benefits accrue to the community. It is hence recommended that local people should be trained as Community Own Resource Persons (CORPs) to ensure sustainability of the facility. This should be accompanied by community sensitization on water pollution and the risks it exposes to their health.

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