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Management of water for irrigation agriculture in semi-arid areas: Problems and prospects

A. Mvungi *, D. Mashauri, N.F. Madulu

Department of Sociology, University of Dar es Salaam, P.O. Box 35043, Dar es Salaam, Tanzania

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Abstract

Most of the Mwanga district is classified as semi-arid with a rainfall range of 300 and 600 mm. Rainfall patterns in the district are unpredictable and are subject to great fluctuations. Like other semi-arid areas, the district is characterized with land degradation, unreliable rainfall, repeated water shortage, periodic famine, overgrazing, dry land cultivation in the marginal areas and heavy competition for limited biomass between farmers and cattle. Vulnerability here is high due to unreliability of weather. The people of Mwanga are dependent on agriculture for their livelihood. However agriculture is difficult in the area due to inadequate rainfall. For a very long time the people have been dependent on irrigation agriculture to ensure food security. Of late the traditional irrigation system is on the decline threatening food security in the area. This paper examines the state and status of the irrigation canal system in Mwanga district with the view of recommending ways in which it can be improved. The study used participatory, survey and in-depth interviews to obtain both quantitative and qualitative data. The major findings are that social, political, environmental and demographic bases that supported the traditional irrigation system have changed drastically. As a corollary to this, the cultural and religious belief systems that supported and guided the traditional canal system management have been replaced by mistrust and corruption in water allocation. In addition the ownership and management system of the water resources that was vested in the initiator clans has changed and now water user groups own the canals/furrows but they do not own the water sources. This has rendered the control of the water sources difficult if not impossible. Currently the system is faced by a number of problems including shortage of water and poor management as demand for water increases and this has led to serious conflicts among and between crop producers and pastoralists over water use. Water users and leaders are also not knowledgeable of the policy guiding water use, ownership and management implying their non-involvement in the policy formulation process. The paper concludes that the traditional irrigation system in Mwanga district that has cushioned people from food insecurity for a long time is under serious threat and something urgently needs to be done. The paper recommends modernizing the irrigation infrastructure, instituting a system of governance that takes on board the interests of all the stakeholders, involving local people and their leaders in the policy formulation process not as an "excess luggage" but as an organic part of the process. The recommendations can only be effected as an organic part of the holistic approach to eradicate poverty.

Keywords: Traditional irrigation; Indigenous knowledge; Food security; Governance; Traditional canals

1. Introduction

1.1. Background to the study

Traditional irrigation canal system in Mwanga district has been practiced since time immemorial and has been a solution for food insecurity. Historical tales and archival documentation indicate that traditional irrigation canals were on use long before colonialism (Fungameza, 1992; Kimambo, 1969; Mashauri, 1985; Yoshida, 1985). Other writers posit that traditional canal system in Mwanga district is in fact as old as stories about the settlement pattern among the Pare who inhabit the area today (Omari, 1969). It was the availability of water and possibility of irrigation that attracted people to settle in what is now Mwanga

* Corresponding author.
E-mail address: kambagha@hotmail.com (A. Mvungi).

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district. During that time the irrigation system thrived on a political system that included dominance of religious and ritualistic beliefs of the Pare. Management and ownership of canals, furrows, water sources and catchment areas was under an initiator clans but water was used by the whole community. In most cases, clan leadership and community was responsible to ensure sustainable irrigation system.

The traditional land use and water management was guided by belief systems (Omari, 1990a). For example, water sources and forests were seen as sacred places where people cannot conduct any activity except rituals and offerings (Omari, 1990b). The management of irrigation canals and water sources was guided by family and clan bonds and strengthened by rituals, culture and customs. In this regard and because people respected the norms of the society the irrigation system was sustainable and a major source of food security. It was the responsibility of the clan leadership and community at large to see to it that the available natural resources including water are sustainably managed and utilized by all in accordance with the existing and accepted norms and regulations. Currently and as result of socio economic, political and demographic changes the traditional irrigation system is under serious threat. Apart from the new political system, which no longer gives respect to traditional beliefs and rituals, population growth in the area has meant putting pressure on the water resources. The result has been drying up of some water sources and canals (Fig. 1), conflicts as people compete for the resource that is inadequate and abandonment of some canals as people have blocked them through settlements.

Whereas in the traditional water resources management equal access to all community members and resource sharing on a much larger scale was ensured, the current management systems does not guarantee equal access to all community members. Experience from the Pare people in Mwanga district indicate limited access to irrigation water where some individuals are even attempting to process water rights individually (Mvungi et al., 2004). The water resource conflicts is even accelerated by increasing extraction in the upper area leaving most of the rivers and canals dry and without water for a long period.

The changes that are occurring in the district have affected traditional water management systems, hence, affecting food security. In many areas, the traditional canals have been strengthened through technical solutions. Though huge amounts of money have been invested in improving the traditional irrigation systems, these efforts have not all been fruitful. To a surprise of many, the systems are not operating efficiently and effectively as compared to the traditional canals. One wonders what went wrong. Actually, the new irrigation system has led to conflicts between villages over access to irrigation water.

The foregoing is echoed by the Draft National Water Policy (2002) when it states that water is increasingly becoming a source of conflict as both population growth and development exert growing pressure on the limited and finite water resources. Although water is central to meeting human basic needs and the needs of the environment, water resources depletion and the increasing demand put at risk some of the water-based investments. Among others one of the culprits is extensive dry season irrigation which dries up the rivers and disturbs the ecosystem and wildlife and inefficient water use e.g., low efficiencies of many irrigation schemes which are estimated at 10–15%.

1.2. Objectives

The study was prompted by the decline of the traditional irrigation canals system in Mwanga district that have been a major cushion against food insecurity in the area for

Fig. 1. Comparison of rivers and canals during wet and dry season, Mwanga district.