

Research Article

Participation of Water Users Associations in Gash spate system management, Sudan

Eltigani Abdelgalil*, Ageel I. Bushara

University of Gezira, Water Management and Irrigation Institute, Wad Medani, Sudan

Received 23 August 2015; received in revised form 12 November 2016; accepted 15 December 2016

Abstract

Water Users Associations (WUAs) have been introduced in Gash Delta Agricultural Scheme (GDAS) in 2004. The level of participation and performance of these associations have been influenced by many factors. The purpose of this paper is to measure the level of participation and to identify the factors influences the performance of WUAs in GDAS in eastern part of Sudan. Field visits, questionnaires, and focus group discussions were conducted during 2013/2014 crop season. The participation of farmers was classified to full, average, less and no participation. The results indicated that WUAs fully participate in water distribution and clearance of agricultural land. It is found that WUAs partially participate in provision of finance, seeds, attend flooding time and report water breakages. WUAs less participate in maintaining of bonds and not yet contribute in mapping of wetland. The results also indicated that WUAs have influenced by the lack of cooperation with other related institutions working in GDAS. The obtained results will contribute in improvement of participatory spate system management.

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Keywords: WUAs; Participation; Gash spate irrigation; Sudan

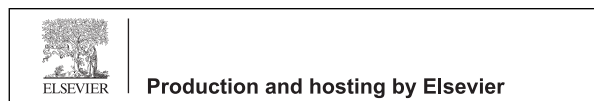
1. Introduction

Over the last three decades, a large number of countries around the world have adopted programs to transfer management of irrigation systems from government agencies to Water Users Associations (Johanson, 1999; Kloezone, 2002). This is to fill in the gap between expected and actual performances of irrigated schemes and finding appropriate institutional arrangements whereby the farmers could play a major role in sustaining irrigation system operations. Experience on water management predicts that the potential benefit of the improvement of water management is by giving farmers a greater role in managing irrigation water. Management of the spate system requires arrangements for various management functions which cannot be achieved without strong farmer organizations. The philosophy behind

* Corresponding author.

E-mail address: eltigani9@hotmail.com (E. Abdelgalil).

Peer review under responsibility of National Water Research Center.



<http://dx.doi.org/10.1016/j.wsj.2016.12.002>

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WUAs is that the involvement of farmers in management of irrigation systems will encourage them to manage their irrigation system. Involvement of farmers in water management considered the only way to reduce pressure on thinly stretched government finances and at the same time ensuring the long-term sustainability of irrigation system. Perret (2002) indicated that after transferring irrigation management responsibilities to WUAs, social development, economic growth, ecological integrity and equal access to water as key objectives of the new water resources management can be achieved. Spate management, by its nature, is very risk-prone and requires high levels of cooperation between farmers to divert and distribute flood flows. Spate system in Gash requires a lot of effort from farmers to operate and maintain, as uncontrolled flows with unpredicted volumes require a large effort in re-constructing canal diversions, leveling of lands, repairing scour damage and in some cases removing sediment deposits. More than any other type of irrigation, participation of farmers is key factor of the success of spate irrigation management. The need for collective action is the basis of traditional spate irrigation practices, and the viability of spate-systems is determined by the level of participation in flood management. WUAs are fundamentally a participatory, bottom-up concept (Sonal, 2003). However, they have existed for centuries and have received particular attention in recent decades as a development tool.

In many countries, increasing water use efficiency has been considered due to shortage of water and limited government finance to irrigated agriculture. For these reasons, participatory irrigation management through WUAs has been emerged. Without farmers' effective participation, water will be diverted to empty land. Potentiality of WUAs constitutes encouraging point as internationally; results of farmers' participation are becoming increasingly viable according to Farbrother (1991), Bashier (2009), Meinen and Subramanian (2002). Qiuqiong et al. (2010) confirmed that there have been few empirical studies to assess the effectiveness of water management reform. The performance of the spate irrigation sector in Sudan is expected to be low and there are attempts for improvement through WUAs. Low spate irrigation efficiency can be attributed to an ineffective water management due to low participation of farmers (Bashier, 2009). In Sudan, since 2002, the emphasis has been focused on performance outcomes and institutional reforms in Gash Delta Agricultural Scheme (GDAS) and Gezira schemes. This resulted in the transfer of numerous irrigation subsystems to Water Users Associations. However, WUAs formed under deteriorated irrigation infrastructure and severe financial problems.

Spate irrigation is an old practice of which flashy spate floods controlled and used for cultivation. It is a unique form of irrigation, predominantly found in arid and semi-arid regions (FAO, 2010). Spate Irrigation management is crucial mainly for agricultural production of the poor. It supports livelihoods of rural population in the Middle East, West Asia and North and East Africa. According to Perry and Bucknall (2009), spate irrigation systems account for approximately 2.5% of irrigated land in Sudan. In Gash spate irrigation system, WUAs were established and supported by IFAD since 2004 under the institutional reform of Gash Sustainable Livelihoods Regeneration Project (GSLRP). A number of 92 WUAs were formed. Each WUA elects two representatives to the overarching WUA organization at the scheme level. Fadol et al. (2012) have showed that there are many challenges facing WUAs in GDAS. Bashier (2009) indicated that the WUAs in GDAS have had obstacles of inadequate funding, lack of revenues and technical capacity.

Since the formation of WUAs in 2004, the performance of WUAs is not well understood. Lee et al. (2015) have assessed WUAs in GAS using few performance factors that are mainly based on the five principles that are originally defined by Wang et al. (2010). In this study, many performance factors and different datasets were used to assess the performance of WUAs. The purpose of this study is to identify the factors that have reduced the performance of both WUAs and spate irrigation efficiency in GDAS in order to improve the livelihoods of inhabitants in the scheme.

1.1. Spate irrigation management problems in Gash

Worldwide, spate irrigation systems are hindered by great variations and unexpected volume and frequency of floods, lack of prediction models, shorter time warning system and occurrence of disastrous flood that often results in considerable damage to irrigation networks, property and land. Flood flows are usually fast and contain great amounts of sediment loads drifted from the catchment and eroded from the river channel. Spate irrigation systems in GDAS suffer from a severe invasion of Mesquite (*Prosopis juliflora* (SW.) DC.) (IFAD, 2004). Mesquite occupies a larger area of the scheme and it has being out of control. Manual work is dominant in Gash because of unavailability of agricultural machinery. Influential farmers add some areas to the planned ones, which create water distribution problems. Some uneven *Mesgas* complicate water distribution. Transportation constitutes big problem because of no roads inside the scheme. Lack of knowledge with bylaws, rules and regulations leads to overlap of duties and responsibilities between

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