Water resources and rural development 6 (2015) 12–23

Contents lists available at ScienceDirect

Water resources and rural development

journal homepage: www.elsevier.com/locate/wrr

Setting up agricultural water management interventions – learning from successful case studies in the Volta and Limpopo river basins

Annemarieke de Bruin [a,*], Rachel Pateman [a], Jennie Barron [a,b,1], Mariam Balima [c], Issa Ouedraogo [b,c,2], Evariste Da Dapola [d], Mathias Fosu [e], Frank O. Annor [f], Manuel Magombeyi [g], Jean-Marie Kileshye Onema [h]

[a] *Stockholm Environment Institute, University of York, Heslington Campus,YO10 5DD, Heslington, York, UK*
[b] *Stockholm Resilience Centre, Stockholm University, Kraftriket 2b 10691, Stockholm, Sweden*
[c] *Institut National de l'Environnement et de Récherche Agricole (INERA), 04 BP 8645, Ouagadougou, Burkina Faso*
[d] *Department of Geography, University of Ouagadougou, Ouagadougou, Burkina Faso*
[e] *Savanna Agricultural Research Institute (SARI), P.O. Box 52, Tamale, Ghana*
[f] *Civil Engineering Department, Kwame Nkrumah University of Science and Technology (KNUST), Kumasi, Ghana*
[g] *School of Civil & Environmental Engineering, University of Witwatersrand, P. Bag 3, WITS 2050, Johannesburg, South Africa*
[h] *Waternet, PO Box MP600, Mount Pleasant, Harare, Zimbabwe*

ARTICLE INFO

Article history:
Received 6 March 2015
Revised 14 July 2015
Accepted 2 September 2015
Available online 9 September 2015

Keywords:
Agricultural water management
Limpopo
Volta
Successful interventions
Soft components

ABSTRACT

Long-term investments in agricultural water management (AWM) interventions in the Volta and Limpopo river basins have aimed at improving water availability and quality for smallholder farming systems. However, sustained and wider uptake of AWM technologies and approaches has not been as successful. We need to learn from successful AWM interventions, those interventions that have led to a sustained or increased uptake of AWM technologies or approaches, and which have led to improved well-being of farmers and livestock keepers in the rural development context of sub-Sahara Africa. This paper explores AWM interventions, specifically, the impacts these interventions have had and the factors contributing to the success of these interventions.

* Corresponding author. Tel.: +44 (2015)1904322888; fax: +44 (0) 1904 432898.
E-mail address: annemarieke.debruin@sei-international.org (A. de Bruin).
[1] International Water Management Institute (IWMI), PO Box 2075, Colombo, Sri Lanka (j.barron@cgiar.org).
[2] World Agroforestry Centre (ICRAF), BP 33 Ouaga 12, Ouagadougou, Burkina Faso (I.ouedraogo@cgiar.org).

http://dx.doi.org/10.1016/j.wrr.2015.09.001

In four countries within the Volta and Limpopo river basins, consultations were carried in 33 case studies of successful AWM interventions with implementing organisations and beneficiaries using a participatory GIS methodology. A systematic text analysis of 55 case study reports showed that these 33 interventions have had a positive impact on the well-being of beneficiaries and there was a sustained and wider uptake of the AWM technologies or approaches introduced. A clear demand for the technology, appropriate design of the technology, input support, training and capacity building, and a sense of ownership of the community helped to sustain the uptake of AWM technologies and approaches. We conclude that implementing organisations would benefit from investing in the soft components of an AWM intervention, as this will increase the likelihood of successful adoption and adaptation of the AWM technologies and approaches in the long-term.

1. Introduction

Long-term investments in agricultural water management (AWM) by, for example, governments and NGOs, in the Volta and Limpopo river basins have aimed to improve food security and income levels for smallholder farming systems (Douxchamps et al., 2012; Douxchamps et al., 2014). However, other institutional and technical constraints in the wider context of these interventions have influenced the sustained and increased uptake of AWM technologies and approaches (de Bruin et al., 2010; Karpouzoglou and Barron, 2014; Stroosnijder et al., 2012) and despite the investment in AWM, overall, smallholder farming systems still produce below potential yields, and with marginal input and management resources (Barron and Noel, 2011). There are success stories in the region, however, where AWM technologies and approaches, ranging from rainfed to full irrigation, have had positive impacts on the well-being of smallholders and rural communities (e.g. Mortimore, 2005; Reij and Smaling, 2008), but these impacts are often not monitored or reported upon in a systematic and holistic manner.

Monitoring of impacts is mainly done per intervention and not at the basin-scale across multiple interventions of different investors. This makes it difficult to find examples of AWM technologies and approaches in which agricultural production has increased and this increase has coincided with other social, economic and ecological positive (or desired) changes at the basin-scale (Barron et al., 2009). Indicators often used to understand whether AWM interventions have contributed to the well-being of beneficiaries are: changes in agricultural production, biophysical factors, agriculturally derived income, poverty and skills (Gabre-Madhin and Haggblade, 2004; Noble et al., 2004). Whether changes are considered to be positive, and AWM interventions considered successful, depends ultimately on the desired development trajectory, often a subjective and value-laden definition, taking into account actors' potential trade-offs between gains and losses both in biophysical and social dimensions. We consider successful AWM interventions as those interventions that have led to a sustained or increased uptake of AWM technologies or approaches, and which have consequently led to an improved well-being of farmers and livestock keepers in the rural development context of sub-Sahara Africa. To contribute to an understanding of the impact of AWM interventions, this paper presents a systematic analysis of multiple interventions, across the Volta and Limpopo river basins.

In addition to the lack of systematic analysis of the impact of AWM interventions, there is only limited evidence for a wider uptake of AWM technologies and approaches within the Volta and Limpopo basins by farmers not part of an AWM intervention. Sustained and increased uptake of AWM technologies and approaches is a dynamic process (Sietz and van Dijk, 2015). The creation of over 1000 small- and medium-sized reservoirs has been facilitated by external investments in the Volta Basin since the 1970s (e.g., Venot et al., 2012) and is evidence of outscaling of this AWM technology. However, there is a lack of understanding of the proliferation of informal privately owned irrigation