

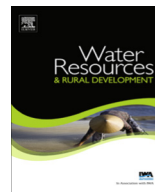


ELSEVIER

Contents lists available at [ScienceDirect](#)

Water resources and rural development

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



Taking stock of forty years of agricultural water management interventions in smallholder systems of Burkina Faso



Sabine Douchamps^{a,*}, Augustine Ayantunde^b, Jennie Barron^c

^a *International Water Management Institute (IWMI) and International Livestock Research Institute (ILRI), Fondation 2iE, GVEA/IWMI, 01 B.P. 594 Ouagadougou, Burkina Faso*

^b *International Livestock Research Institute (ILRI), c/o CIFOR, 06 B.P. 9478 Ouagadougou, Burkina Faso*

^c *Stockholm Environment Institute (SEI), University of York, Heslington, York YO10 5DD, UK*

ARTICLE INFO

Article history:

Received 13 February 2013

Revised 2 December 2013

Accepted 6 December 2013

Available online 12 December 2013

Keywords:

Development impact

Historical approach

Investments

Livelihoods

Projects design

ABSTRACT

Agricultural water management (AWM) strategies have been extensively studied and promoted in Burkina Faso during the past four decades. However, rainfall variability and water access continue to limit agricultural production of most of the smallholder farming systems of the country. Our goals in this paper are: (i) to review the evolution of AWM development with respect to the technologies promoted, while emphasizing the context, approaches, investments and outcomes; (ii) to explore the linkages between the evolution of AWM projects, their outcomes and their impacts on rural livelihoods; and (iii) to provide recommendations to enhance the impact of new development initiatives. Between 1970 and 2009, 195 bilateral and multilateral AWM projects were implemented in Burkina Faso, corresponding to an investment of US\$ 641 million. The study of the evolution of these projects allows one to assess the reasons for their success or failure. While projects involved many technical solutions, their actual impact on livelihoods is debatable. Using an outcome–impacts framework, we provide recommendations for enhancing the effectiveness and sustainability of investments in agricultural water management.

© 2013 Elsevier Ltd. All rights reserved.

* Corresponding author. Tel.: +226 7592 1622.

E-mail addresses: s.douchamps@cgiar.org (S. Douchamps), a.ayantunde@cgiar.org (A. Ayantunde), jennie.barron@sei-international.org (J. Barron).

Introduction

The frequency of annual droughts and of extreme seasonal hot temperatures has increased from the 1970s, and the situation is likely to be further exacerbated in the future [6,31,29]. To cope with these increasingly difficult conditions, smallholder farmers must be better prepared and adapt more quickly to climate change and volatile markets. Improvements in agricultural water management (AWM) thus rank high on the development agenda.

For decades, AWM strategies have been extensively promoted by numerous development projects in the dry and vulnerable Sahel to improve agricultural productivity and generate livelihood benefits. These strategies, which are described in detail by other authors [45,26,4], have high potential, as agricultural systems are mostly rainfed and currently use only a small portion of available rainfall [33]. Evidence of the benefits of AWM strategies, in particular at the farm level, have been well described. The reported benefits include higher crop yields, improved groundwater recharge, and product diversification [58,25,22,74,20,71]. However, despite the efforts of numerous projects during the years since independence in the 1960s, water access over time and space still limits the output of most smallholder crop-livestock farmers in the Sahel, and cereal yields are far below their potential [21,63,19].

In this paper we draw lessons from the past to inform future actions in agricultural smallholder development, by considering the underlying causes of the success and failure of past projects. Several authors have previously examined the adoption of AWM strategies by smallholders, and described ways in which adoption can be enhanced; however, most of this literature focuses on single aspects of AWM or isolated projects. To our knowledge, there is no review embracing the various aspects of AWM within the broad scope of integrated crop-livestock systems.

Due to its dry climate, its high vulnerability to varying rainfall and climate change [18] and the substantial amount of AWM investment, we chose Burkina Faso as case study country. Of the country's 16 million residents, most live below the poverty threshold [24], and an estimated 90% rely on rainfed crop-livestock systems for their livelihood [67]. Annual rainfall is characterized by a marked gradient between the north (400 mm) and the south (1100 mm). Burkina Faso suffers physical water scarcity, with only about 900 m³/y *per capita* available [33].

We review the evolution of AWM research and development interventions with respect to the technologies promoted, while emphasizing the context, investments and outcomes in a typical Sahelian country. In addition, we explore linkages involving the evolution of AWM projects, their outcomes, and their impacts on rural livelihoods. Our goal is to develop recommendations for enhancing the impact of future investments in agricultural water management.

Materials and methods

We consider three sources of information describing the evolution of investments in agricultural water management in Burkina Faso. First, we review the major projects and historical trends by interviewing 17 resource experts and other key informants using a semi-structured questionnaire. The key informants occupy relevant functions in government organizations, funding agencies, international and bilateral cooperation organisms, research organizations, NGOs or farmers' organizations involved in agriculture and rural development in Burkina Faso (Table 1). We maintain the confidentiality of our key informants by assigning an ID number to each, which combines the type of organization (Table 1) and a sequential number. For example, "GOV1" is the ID of the first interviewee from a government organization.

Our primary questions involve the evolution of the context of AWM (historical trends, time periods in which important investments in AWM were made, the actors involved and the mechanisms of coordination), the evolution of practices (which technologies were promoted when, where, and why), and the success and failure of selected strategies that promoted investments in AWM.

Following the interviews, we reviewed more than 250 documents published from 1969 to 2011, to learn about the dimensions of AWM research and development from a historical perspective. Our review of peer-reviewed publications allowed us to understand the outcomes from research on AWM

Download English Version:

<https://daneshyari.com/en/article/1066620>

Download Persian Version:

<https://daneshyari.com/article/1066620>

[Daneshyari.com](https://daneshyari.com)