

Impacts of a small reservoir on land use and livelihood in Burkina Faso

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Introduction

Growing population, low farm productivity, water shortage in dry season, and subsequently food insecurity are major problems in Burkina Faso. Since rainfall is one of the most important environmental constraints for agricultural production, irrigation is crucial for sustaining and improving rural livelihoods. The German Dreyer Foundation, therefore, initiated a small reservoir project aiming on increasing food production through irrigation agriculture in Dano, Southwestern Burkina Faso. Thus, a reservoir covering 25 hectares and irrigating 20 hectares of farmland were created. In order to manage the irrigated water resources efficiently, farmers are organized in a cooperative, the Timisso Dreyer Farmers Cooperative that is organizationally and financially supported by the foundation.



Assessment

For the assessment of the irrigation project, the sustainable livelihood concept was chosen because it focuses on human welfare and sustainable use of natural resources. In order to examine the distributional aspects of impacts, a typology of households in relation to the degree of intervention by the irrigation project based on households' share of irrigated land in total landholdings was developed. The classification resulted in three household groups I, II and III with group size 17, 15 and 12 (Fig. 1).

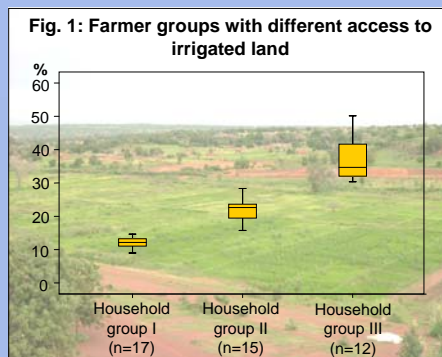
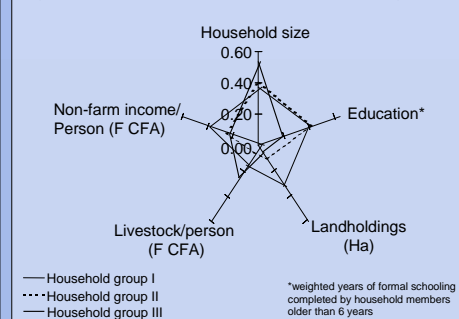


Fig. 2: Livelihood indicators of household groups



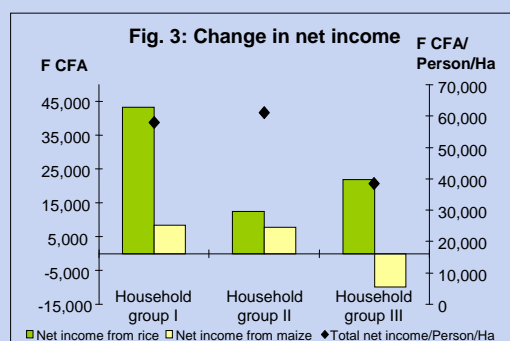
The groups defined are relatively homogenous with regard to their share of irrigated land of total landholdings of the household. However, regarding livelihood asset endowment the household groups differ considerably (Fig. 2).

I Impacts on land use

	Group I		Group II		Group III	
	Area (%)	Yield (kg/ha)	Area (%)	Yield (kg/ha)	Area (%)	Yield (kg/ha)
Before dam						
Cereals	79	2,492	93	2,345	79	2,255
Rice	21	2,098	7	2,319	21	1,299
In 2006						
Cereals	94	2,584	72	2,017	100	1,686
Rice	100	4,519	100	4,264	100	2,938
Vegetable, Chili	6	n.a.	5	n.a.	0	n.a.

The permanent availability of water allows two cropping seasons. In rainy season farmers grow mainly paddy rice and maize or vegetable in dry season.

II Impact on income

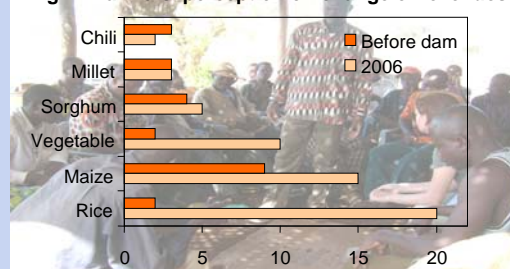


III Impact on income equity

Equity in distribution of benefits is essential for improving livelihoods, to avoid conflicts and to enhance participation. Though, within farmer group II and III income inequity increased since the implementation of the irrigation system.

	Gini index		
	Group I	Group II	Group III
Before dam	0.49	0.33	0.25
In 2006	0.26	0.40	0.28

Fig. 4: Farmers' perception on change of revenues



Conclusion

There is evidence that the establishment of the small reservoir led to a shift from maize and sorghum as predominant rainfed crops for subsistence to more profitable crops such as rice in rainy season and vegetable in dry season. As a result of land use change and agricultural intensification, farm income from irrigated land increased considerably (Fig. 3 and Fig. 4). Subsequently, livelihood of concerned farmers improved. The benefits of the irrigation are, however, not equally distributed among the three identified groups of beneficiaries. It is very vital to take into account these differences of the farm households to ensure that they can benefit from the project and avoid conflicts. Better communication among stakeholders to detect actual needs, constraints and opportunities will result in the provision of better tailored support and enhanced participation.