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Watershed conservation-based market oriented commodity development: A move towards resilient farming?

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Introduction

Reversing watershed degradation and food insecurity has been one of the major development challenges in the semi-arid areas of northern Ethiopia where rainfed dependent mixed crop-livestock farming is predominant (Berhanu et al., 2010; SERA, 2000). As an entry point, community based physical soil and water conservation has been launched at village levels (Belete, 2009). The conservation has been initiated on cultivable lands and gradually extended to watershed levels. The conservation and enclosure of watersheds have resulted in improved water retention capacity and recovery of perennial bee forage plants in upstream hilly sides, and revitalized surface and groundwater in the downstream of the watersheds (Belete, 2009). Despite the intensive interventions in watershed conservation and recovery, the contribution to the economy of smallholder farmers has been low. The watershed approach has been useful to harmonize the use of soil, water and vegetation in a way that conserves these resources and improve household income. The watershed management can be augmented with market oriented commodity developments along the watershed resources gradient: upstream, valley bottoms and downstream. In order to increase benefits to farmers, participatory, demand driven, skill and knowledge based market oriented commodity development has been introduced, tested and promoted in Atsbi-Womberta district, northern Ethiopia, since 2005/06. The objective of this paper is to present the response to the integrated interventions along the watershed resources gradient.

Material and Methods

Market oriented commodity development integrated in synergy with watershed resources gradient (Fig. 1). Beekeeping mainly targeted in the upstream hilly sides where perennial bee forage is dominant, sheep fattening in the forage rich bottomlands and high value irrigated crops in the downstream of the watershed.

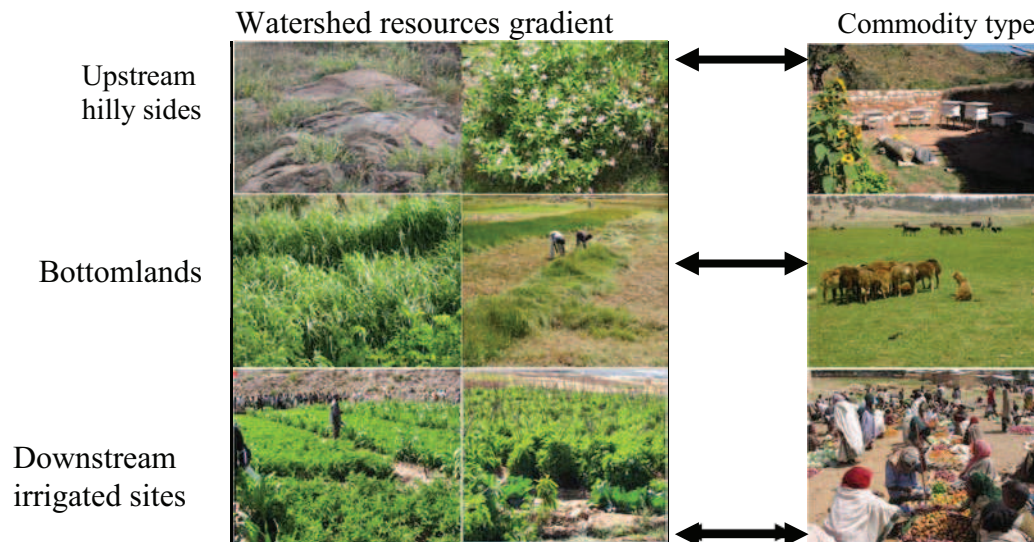


Fig.1. Pictures showing the synergy of watershed based conserved resources gradient (left) with market oriented commodities (right), Atsbi-Womberta district, northern Ethiopia.

The key interventions include technical knowledge and skill development of farmers, extension service providers and other relevant partners along the commodity value chain development. The value chain based interventions including improved technologies, processing and establishment of market linkages and access to improved inputs of beekeeping, sheep fattening and high value irrigated crops. Beekeeping value chain interventions include improvement in bee forage availability, colony multiplication, improved hive use and management, honey harvesting techniques, storage and grading, and market linkages. Similar intervention approaches followed for sheep fattening. For high value irrigated crops, interventions include selection of high value crops (onion, tomato, pepper and garlic), supply of planting materials, implement demonstration, operation and maintenance, market linkages.

Results and Discussion

Results of action research show that the average net income of the beekeeping adopter households increased by about three-fold in the upstream watersheds (Figs. 2). A honey

productivity trend of adopters and non-adopters was consistent over several seasons where the rainfall amount and distribution varied considerably (Fig. 2).

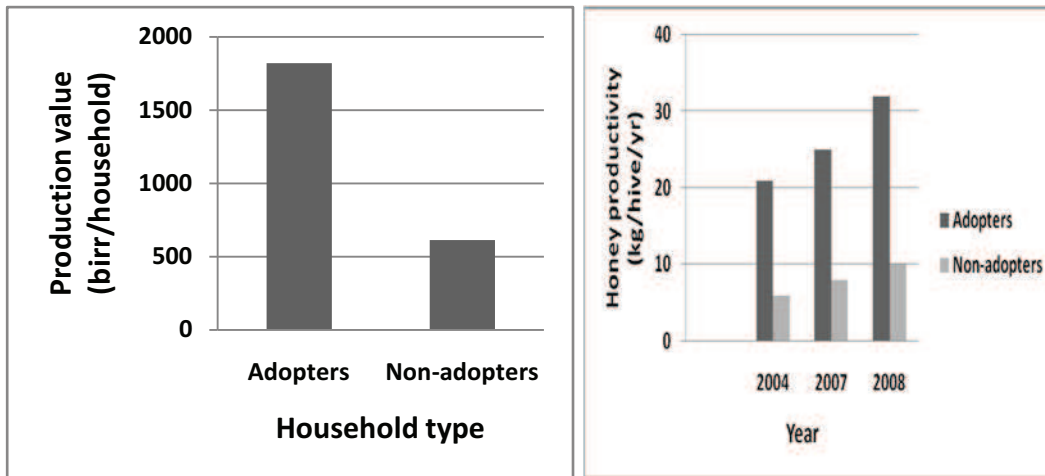


Fig. 2. Honey production value (birr/household, left) and honey productivity (kg/hive/yr, right) of beekeeping adopter and non-adopter households in the upper hilly sides of the watershed, Atsbi-Womberta district, northern Ethiopia.

In the bottomlands, total forage biomass increased by about five fold following the cut and carry system of livestock feeding interventions (Fig. 3). Similarly, the number of fattened sheep and income increased by five-fold in the bottomlands in 2009 compared to 2005 (Fig. 3).

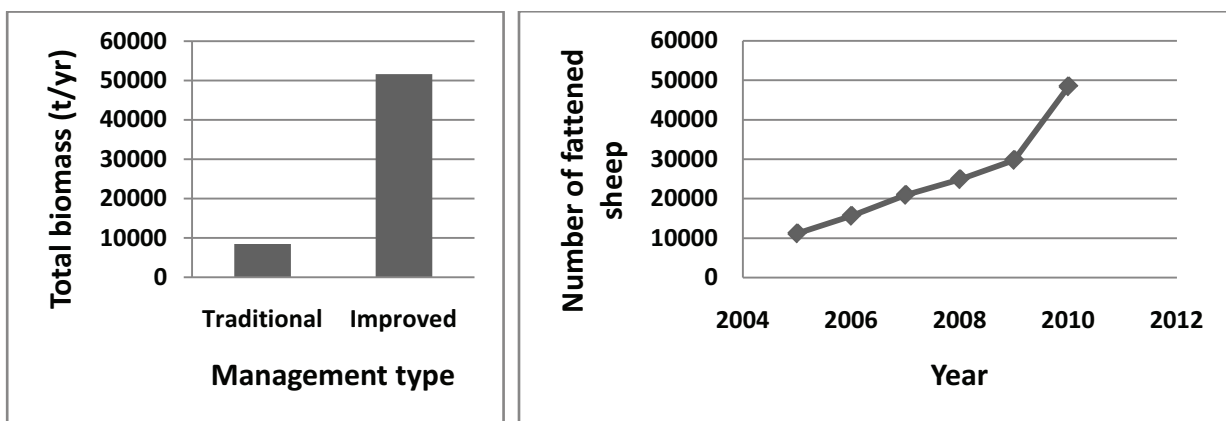


Fig. 3. Forage biomass (t/yr, left) under improved and traditional grazing, and number of fattened sheep (number/yr, right) in the bottomlands of the watersheds, Atsbi-Womberta district, northern Ethiopia.

The net income of adopter farmers increased by nine-fold in the irrigated downstream of the watersheds as compared to the income of farmers from the non-intervention watersheds (Fig. 4).

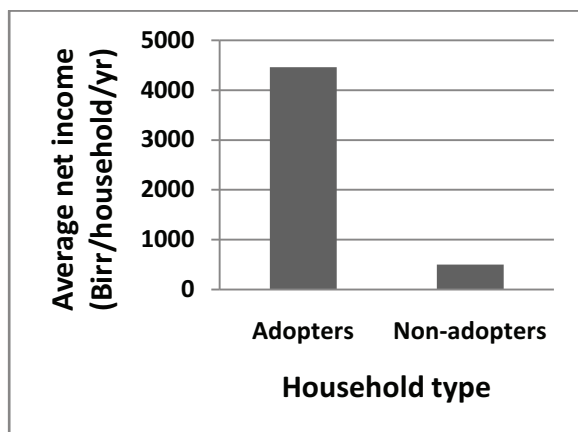


Fig. 4. Average net income (birr/household/yr) of adopter and non-adopter farmers in the downstream irrigated sites of the watersheds, Atsbi-Womberta district, northern Ethiopia.

Conclusions and Outlook

The results imply that integrating natural resource conservation with market oriented commodity development provides real incentive for farmers to follow sustainable farming practices. This income difference was also observed in seasons with extreme rainfall variability when the traditional crops failed to produce grain and declined livestock productivity in the non-intervention sites. This imply that integrating market oriented commodity development in synergy with the conserved watershed resources gradient provides real income to farmers that is relatively resilient to extreme rainfall variability. The generation of better benefits from the integrated watersheds interventions triggers the community to re-invest and protect the watersheds sustainably. Thus, knowledge and skill based market oriented commodity development unlocks the use of conserved watershed resources gradient effectively and efficiently.

References

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