



Socioeconomic impacts of small-scale irrigation schemes on women in Swaziland

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ABSTRACT

The main objective of this study was to assess the impact of small-scale irrigation schemes on food security and incomes for both women and men. A comparative study approach was used. Heads of households were interviewed using a questionnaire to determine crop production and income generated from two irrigation schemes. The production of crops and income earned were compared between households headed by men and those headed by women, before and after the development of irrigation scheme, and between a scheme which also made water available for crop production at homestead, and a scheme where water was only available for community level production. The results showed that irrigation schemes affected production of men and women differently. The production of maize, the main staple food crop, declined after the establishment of irrigation scheme due to household moving towards sugarcane production. Irrigation schemes affected negatively household incomes, especially those headed by women due to the cessation of cotton production. The establishment of irrigation schemes increased food insecurity.

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1. Introduction

Swaziland is a low middle income country with a per capita income of about US \$1350/year. However, the proportion of people living below the poverty line is 69% (of which 63% are females and 37% males) and these were subsisting on less than US \$24 per capita per month in 2004 (UNDP Swaziland, 2006). Most of those affected are the rural and urban poor, and women who are concentrated in small-scale agriculture and informal sector (UNDP, 2001). The incidence of poverty is particularly high in rural areas and among the women due to gender imbalances in access to resources and their low participation in income generating activities. Women head about 40% of homesteads in rural areas of Swaziland. Small-scale irrigation schemes provide an avenue for rural women to increase their crop yields, household food supplies, and income.

In Swaziland, women and the minority groups are routinely discriminated against at various levels of life as well as in accessing some resources. The Gender Empowerment Index (GEM) which was 0.378 in 1999 and 0.381 in 2000 is low (World Bank, 2000) and revealed presence of structural and traditional barriers to women's development. These barriers prevent women from participating in and contributing fully to national development (UNDP,

2001). There is need to bridge the gap in education, employment, economic and political participation that separate women and men (UNDP, 2001) in order to improve Swaziland's GEM Index.

In most African countries there is insufficient mobilization of water for agricultural purposes to ensure food security and combat poverty, and lack of participation of beneficiary populations in water resource development and management actions (FAO, 2004). Special attention is required to ensure that the voices of household level users, especially women, are heard in Integrated Water Resource Management (IWRM) (Van Koppen, 2002).

Investment in rural water supply for irrigation purposes is aimed at improving income and food security through improved productivity. However, rural poverty and food insecurity still prevail. This necessitates studies aimed at establishing the reasons for water projects not achieving their objectives. The focus on women's access and use of water is relevant as women are often the main actors in the production of food crops. Improving women's access and use of productive water will improve food productivity and security. Access to productive assets, particularly land and capital, has been a major contributing factor to inequality in Swaziland.

The problem that has motivated this study is that we do not have adequate information on how integrated water resource management has been put into practice at local levels in Swaziland. The gender dimensions in irrigation water, and in particular gender relationships and how these promote or limit the development of women is not known. The objectives of the study were to assess

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gender relations with regards to access and use of water for productive uses, its impact on income generation for both women and men and recommend policy actions which when implemented will make water projects more efficient and effective in rural development, especially on women's development.

2. Methodology and study area

2.1. Study approach

The approach for studying gender relations in irrigation water used by Van Koppen (2002) was adapted in this study. According to this approach gender relations are analyzed at different levels; household, farm, community, regional and national. In this study the focus was on household and farm levels where intra-household organization of farming was analyzed. Household's organization of farming was analyzed by establishing crops, fruits and vegetables grown, quantities produced and how they were used. The decisions studied related to both farm production and benefits. Decisions on farm production included crop choices and use of the crops, while those on benefits focused on the use of money obtained from the sale of crops, vegetables and fruits. Socioeconomic impacts were also analyzed in terms of income generated from crop production through irrigation. At farm level aspects of local water distribution and use were captured by asking heads of households about productive uses of water and specifically whether they applied water in any of their productions. This approach made it possible to establish current water use and demand, gender relations with regards to access and use of water and the implications of this on women's income generation. It also allowed the establishment of changes brought by rural water projects on women's agricultural production and incomes by comparing the situation before (2000) and after the implementation of irrigation schemes (2006) as well as between communities with different types of schemes.

2.2. Study area

The study was carried out in the Lowveld region of Swaziland. This is a region with low and erratic rainfall and therefore irrigation schemes play an important role in stabilizing agricultural production. Two communities, Malibeni and Mangweni, that were chosen for this study started their small-scale irrigated sugarcane schemes in 2002 under the stewardship of Swaziland Water and Agricultural Development Enterprise (SWADE). The sugarcane schemes involved significant reorganization in the use of land and farming in the communities. Communal grazing land and individual household farms were converted to a community small-scale irrigated sugarcane. Farmers formed sugarcane associations which organized and managed production for the community. Individual farmers were not involved directly in the day to day production (except those employed mostly as casual labourers) and making decisions involving production. From the sugar sales, production costs were paid, loans serviced and what was left was paid to farmers. Farmers interviewed in 2006 said they received about US \$270 which was considered very low, partly due to high cost of pumping water and repayment of banks loans.

2.3. Selection of the communities and households for the study

The two irrigation schemes selected were different in terms of the focus of the irrigation schemes, location, distribution of water, size of fields under individual household production. In Malibeni land uses and settlement was reorganized. The small farm holdings and grazing land were amalgamated. Households were left with three quarters of a hectare for housing and individual production and the rest converted into sugarcane fields. Some of the irrigation

water was directed to households for both consumptive as well as productive purposes.

In Mangweni distant cultivate lands and communal grazing land were converted to community sugarcane farms. These were located far from the homes. Individual households remained with the fields around homesteads. Irrigation water was pumped to the sugarcane fields only. No water was availed for individual household production.

A sample size of 84 heads of households was selected. The gender composition of the sampled heads of households was 31 men, 8 women from Malibeni and 36 men, 9 women from Mangweni. The size of women head of household sampled is small, but these were the only ones found.

2.4. Data sources, collection and analysis

The study used primary data supplemented by secondary data and observation. The use of productive water and its impact on income generated was assessed by asking women and men to indicate (a) the different economic activities to which current water sources were utilized, (b) crop types and an estimate of quantities produced, (c) how the crops were used, and (d) an estimate of income generated from the sale of crops. The productive uses of water and income generated were compared between men and women and between communities with different types of irrigation projects as well as before and after irrigation projects. A questionnaire was used to solicit information from the heads of sampled households. Data was analyzed by comparing the type and quantities of crops grown before and after irrigation schemes. The use of irrigation schemes and their impacts on income generation was analyzed and compared between the two communities as well as across gender. The student's *t*-test was used to test the statistical significance of the observed differences in production and incomes before and after irrigation schemes, between the two irrigating communities, and between male and women heads of households.

3. Results

3.1. Demographic and socioeconomic characteristics of the heads of households

The majority (61%) of the female heads were widowed, with no formal education (56%) and unemployed (54%). With regards to male heading households, the majority were married (80%), 41% had no formal education, and 30% were unemployed. The proportion of female headed households is increasing due to the high mortality rates related to HIV/AIDS (IFAD, 2007). Unemployment rates in Swaziland was 29% in 2001 (SHIES, 2001). Unemployment rates are higher in rural areas where there are few employment opportunities. In Malibeni the individual fields were of the same size, three quarters of a hectare. In Mangweni the majority (44% men and 56% women) owned between 2 and 3 hectares. Some of the households, both men (14%) and women (11%) owned over three hectares. The national average farm size is 1.7 hectare.

3.2. Main crops, vegetables and fruits grown

The results (Figs. 1 and 2) showed that more men were involved in the production of food crops to meet their families' food demands before irrigation schemes came into operation. This was particularly so with Mangweni community where the majority (74%) of the men and women (57%) grew maize as their main staple food crop. Few women were also involved in the production of other food crops such as sweet potatoes, jumbo beans, peanuts and sorghum. The proportion of female headed households who grew

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