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Research Article

CHALLENGES AND OPPORTUNITIES OF MALE-HEADED AND FEMALE-HEADED HOUSEHOLDS IN IRRIGATION UTILIZATION IN THE CASE OF ALAMATA DISTRICT, TIGRAY REGIONAL STATE, ETHIOPIA

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ABSTRACT

The main driver of Ethiopia's economy is rain-fed agriculture. It is expected that this sector will support the entire economy and alter its composition. Still, millions of people frequently go without food as a result of the nation's severe drought. Small-scale irrigation strategies are a valuable tool for lowering vulnerability and raising output. It is imperative to take into account the impact of gender on irrigation farming in small-scale schemes. This study looked into the opportunities and problems associated with small-scale irrigation practices for MHH and FHH households. Using a multistage sampling procedure, two of the eight Kebelles in the district that use irrigation were chosen, and 130 sample households were chosen, 80 of which were headed by men and 50 by women, based on the proportion of the Kebelles population that uses irrigation in the chosen Kebelles. The findings indicate that households headed by men and women experience similar challenges in the areas of technology and the market, including low credit availability, insufficient labor, and training gaps. Lastly, the study recommends that government and non-governmental organizations should give special consideration to enhancing the involvement of households headed by women and men in irrigation agriculture.

KEYWORDS: FHH, MHH Challenges, and Irrigation.

INTRODUCTION

Agricultural intensive economic activities, mainly agriculture are the mainstay of the livelihood and the main source of the well-being of Ethiopians **(BEFIKADU, 2016).** Although agriculture is the main source of Ethiopian households' welfare; it is undermined by erratic climate change like drought **(Ayele et al., 2013); (Hagos et al., 2009).** This climate change is a threat to agricultural production and productivity, which rendering households to a high degree of risk and misfortune **(Laia Domenech, 2013); (Foltz & Gars, 2013).**

In most developing countries, like Ethiopia, irrigation infrastructure and technology investment is mostly funded by the government (Kulkarni**, 2017).** Involvement and investment from the private sector, projects, and non-government organizations are crucial for scaling up irrigation technology and irrigation. Interventions in agriculture lead to a shift in food production, production variability, dietary variety, labor productivity, a change in the role of women, and the living standards of households **(Laia Domenech, 2013; FAO, 2011; Hagos et al., 2009; Regassa E. Namara & I, 2005).**

In Ethiopia, rural women represent a tremendous productive resource in the agricultural sector **(Teka & Teklehaimanot, 2021)**. They are major contributors to the agricultural workforce, either as family members or in their own right as women household heads **(FAO, 2011).** Women-headed households are more susceptible to the negative consequences of the poor agricultural productivity and production for the following reasons **(FAO, 2011): (Foltz & Gars, 2013):** (a) They face gender inequality in various activities, which makes them

economically disadvantaged; (b) they are characterized by a higher total dependency ratio; and (c) they have a double-day burden, where they have to fulfil both domestic duties and make money outside their home. Any technology that saves women-headed household's time and improves their involvement in agriculture helps them to be more productive and efficient. Women's access and participation in irrigation have a multiplier effect on improving household wellbeing both in the short and long run since women mainly invest more in nutrition, health, and education of the household than men **(Laia Domenech, 2013).**

Various studies examined opportunities and challenges associated with the nation's irrigation practices. Nonetheless, the limitations associated with gender and small-scale irrigation techniques are the main focus of this study. Thus, this study's goals were to evaluate the main obstacles that both male and female heads of household faced as well as their prospects for irrigators in the research area.

RESEARCH METHODOLOGY

2.1. Sampling technique and sample size determination

To choose the respondents, a multistage stratified sampling design was employed. First, Alamata woreda was chosen on purpose due to its possible irrigation accessibility. Selam bekalsi kebelles and Kulugzie lemlem were purposefully chosen in the second stage based on their capacity for irrigation and their representativeness in capturing the realities of small-scale irrigation users in the district. The sample respondents were divided into households headed by men and women in the following stage based on their sex. Ultimately, utilizing a basic random sampling technique, 130 households—80 male and 50 female irrigation users—were chosen from the designated peasant associations.

2.2. Data type and sources

To gather the information required for the study, primary and secondary data sources provided both quantitative and qualitative data types. Research instruments like key informant interviews, focus groups, and household survey questionnaires were used to gather the necessary primary data from various primary sources. Books, journals, reports, and other printed and digital materials, both published and unpublished, served as the secondary data sources for this investigation.

2.3. Methods of data analysis

It was used to provide an explanation for the socioeconomic and demographic behavior of household features. Descriptive statistics, including measures of central tendency, frequency, percentages, and ranking, were used to analyze primary data obtained from individuals through the interview schedule using the Statistical Package for Social Science (SPSS). Qualitative analysis was used to examine information from key informant discussions as well as additional qualitative data.

RESULTS AND DISCUSSIONS

3.1. Challenges and Opportunities of irrigation utilization for MHH and FHH

3.1.1. Challenges of irrigation utilization for MHH and FHH

1-Marketing Problem

Market instability was first ranked as the most significant challenge in the study area by both MHH and FHH, based on their discussion with FG and the survey results. The more complicated the marketing channel, the less likely farmers are to produce high-quality, marketable products because of the high risk involved in horticultural production. In the research area, 68% of MHH and 58% of FHH respondents cited a lack of an effective marketing system as a major issue. This is shown in the table below. This is consistent with earlier research conducted in other parts of Ethiopia, which found that vegetable producers lacked coordination to strengthen their negotiating position regarding vegetable prices and that there was no marketing organization in place to protect farmers' rights and interests regarding their marketability **(Akalu, 2007).**

2: Labor availability

When it comes to cultivating land, MHH ranked the lack of labor as the second most important challenge, while FHH ranked the lack of capital to hire daily labor as the third most important challenge. The heads of these households explain that these are the main challenges that have prevented them from benefiting as much from irrigation as other groups. There are irrigation users who have up to 2 hectares of irrigated land that they are unable to manage at the household level, according to the FGD with the WUA committee and DA. The income of women-headed households is negatively impacted by issues with labor and time availability (Ingham **et al., 2009)**.

3: Low access to credit

For 61% of MHH irrigators, low access to credit facilities was the third most important challenge; however, for 46% of FHH irrigators, it was the second most important challenge. Because their production is capital-intensive, the respondents claimed, they need credit to supplement their income so they can invest in their farms and get the anticipated yield. Respondents claim that credit helps them buy all the supplies and services needed for their farms. Therefore, it is crucial that service providers offer credit services to assist these irrigation users **(Fikirie et al., 2017).**

4: Lack of Input Supply

According to a report from the FGD irrigation system, farmers wish to grow market-demanding crops, but they are unable to obtain this particular crop variety. Farmers also desire crops that are resistant to crop diseases, but they are unable to obtain them. According to 44% and 39% of FHH and MHH respondents, respectively, the

survey results also indicated that the lack of improved input supply was the fourth biggest obstacle to irrigation utilization in the study area.

The result is contrary to **Catherine Ragasa and Guush Berhane (2011)** who reported that plots of MHHs were more likely to be applied with chemical fertilizer, while plots of FHHs were more likely to be applied with manure. The rate of fertilizer use was significantly greater in plots managed by MHHs than those by FHHs.

5: Irrigation water scarcity

The scarcity of irrigation water is the fifth challenge facing MHH and FHH in the study area, as per the discussion with FG and the survey results. The main canal division box, underground water pipe failure, siltation irrigation canal, and unfair irrigation water users are the main causes of this issue. The area's water loss issue prevents the farm households from using their water supply.

6: Lack of Skill and Training

A limitation that prevents irrigation farms from being used to their full potential is a lack of skills, according to the data gathered from focus group discussions. All focus group participants identified inadequate knowledge of pertinent agronomic practices and vegetable production as additional hindrances. It has been established that most farmers possess insufficient training in the areas of irrigation scheme design, execution, upkeep, and operation. A similar conclusion is also supported by **Nahusenay A. and Tessfaye (2015)** who hypothesized that women in Ethiopia typically have restricted access to agricultural products, credit facilities, training, and information.

Table 1: Challenges of Irrigation Utilization by MHH and FHH.

Challenge	Gender of household head			
	FHH	Rank	MHH	Rank
Lack of inputs	44%	4th	39%	4th
Shortage of labor	48%	3rd	54%	2nd
Lack of training	41%	6th	32%	6th
Water scarcity	42%	5th	35%	5th
Lack of marketing for produce	68%	1st	58%	1st
Lack of access to credit	61%	2nd	46%	3rd
Absence of gov.t support	35%	7th	28%	7th

Source: own survey 2019

3.1.2. Opportunities of irrigation utilization for MHH and FHH

Focus groups with sample respondents and key informants revealed that there are opportunities for smallholder farmers to participate in irrigated farming. The presence of surface water in the region is one of the main advantages. It is evident that in order for farmers to make the most of new irrigation technologies, they need accurate and up-to-date information. In light of this, the status of the extension staff is extremely important.

To bring about sound agricultural development, especially on the part of smallholder farmers, the primary goal of extension programs should be to start the change process. The report recommends that extension agents provide all other required inputs and services in addition to offering technical advice.

Only model farmers received training from the district rural and agricultural development office, working with the Relief Society of Tigray, according to information gathered from key informants. That being said, development agents are the only source of information that most farmers have about irrigation water management.

Continuous training is necessary to achieve the desired effects on irrigation agriculture's productivity and production; partial and irregular training will not do this.

Another factor that could present a chance for irrigation development in the research area is the national government's strong emphasis on the subject. However, the government offered no assistance to the study area for the development of irrigation infrastructure.

The region has made greater use of indigenous knowledge, with minimal assistance from agricultural experts' consultations. Therefore, the study area would benefit society more and feed other areas, contributing to the nation's economic development, if the government provided more support for modern irrigation infrastructure.

CONCLUSION AND RECOMMENDATION

According to the findings of descriptive statistics, focus groups, and various group interviews, the primary issue facing irrigation users in the study area—both MHH and FHH—was market instability. Therefore, the relevant authorities should prioritize the organization of marketing cooperatives and the recognition of recently formed cooperatives. In addition, endeavors ought to be undertaken to establish connections between vegetable growers and prospective markets, enabling farmers to offer their produce at a reasonable cost. Male irrigators ranked the lack of labor as their second biggest obstacle, while female irrigators ranked the lack of capital to hire daily labor as their third biggest obstacle in cultivating land. Male irrigators ranked limited access to credit

facilities as their third biggest challenge, while female irrigators ranked it as their second biggest obstacle. The respondents claimed that because their production is capital-intensive, they need credit to supplement their income so they can make investments in their farms and get the anticipated yield. The remaining challenges affected both MHH and FHH, and each of them gave them a similar ranking.

6. Declarations

Ethics, approval, and consent to participate

As the study involves primary data collection with farmers, participation in the survey was completely voluntary, and informed consent was obtained from all the participant respondents through an informed consent form.

Consent for publication

All the primary data has been anonymized. Besides, informed consent was obtained from all the participant respondents through an informed consent form.

Availability of data and materials

Data will be made available upon reasonable request.

Conflicts of interest or competing interests

The authors declare that they have no competing interests.

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Authors' contributions

All authors contributed to the conception, approach, research, oversight, evaluation, data curation, analysis, drafting, and editing.

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