RESEARCH ARTICLE

Gender role in irrigated agricultural activities in the case of Alamata district, Tigray regional state, Ethiopia

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Women account for more than half of the work force by participating in different activities, either directly or indirectly. The study examined gender role in small scale irrigation agricultural activities in Alamata district, southern Tigray zone of Tigray region, Ethiopia. Multistage sampling procedure was used to select 2 Kebeles out of 8 irrigation user Kebeles in the District and 130 sample households were selected; 80 male headed households and 50 female headed households based on proportion to Kebelles population which is irrigation user households in the selected Kebeles. The finding of the research indicates that most of the time FHH irrigation users are more involved in irrigation management activities such as planting, removing weeds, harvesting and selling products while MHH participate in heavy and risky tasks such as land clearing, cultivation, crop watering, chemical spray and transport products. Therefore, the study suggests to addressing some of the gender differences, efforts should be made to provide equitable education, credit and extension services for both male headed households and female headed households by government and non-governmental organization.

Key Words: *Gender; Small scale irrigation; Challenges; Agricultural activities*

INTRODUCTION

Agriculture is the base of our food, transformation to industrialization, climatic change control system. Agriculture is also the base the society for development as well as poverty reduction for individuals and in country level. The current government of Ethiopia is highly involved in the agricultural sector and, through its developmental state theory, has put the highest level of investment into the sector. The agricultural production in our country come from both in private peasant holdings in large as well as in medium commercial farms, where the commercial farms consist of the state and private investment commercial frames [1].

In most developing countries, gender disparity is a major obstacle to meeting the MDG targets. According to UNDP, achieving the goals will be impossible without closing the gap between women and men in terms of capacities, access and control of resources and opportunities. A number of serious misconceptions around gender related issues do exist hampering the effective implementation of gender related policies and strategies [2].

Women account for more than half of the work force by participating in different activities, either directly or indirectly. The gender division of labor varies from one society and culture to another, and within each culture external circumstances influence the level of activity [3].

Irrigation is one of the strategic options that have been adopted in mitigating the water scarcity and dependence on rainfall for agricultural production. Irrigation has been taken as a remedy for inadequate food supplies, a cover against erratic rainfall situations, enhanced employment opportunities and secure incomes and promotion of cropping intensification and diversification. Given the importance of the irrigation, many governments have availed huge resources in establishing new schemes as well as repairing the existing ones to boost the socio-economic contribution of the agricultural sector [4].

Gender roles in the country also vary according to ethnicity, income, and status. Moreover, as has already mentioned, Ethiopian women are largely responsible for nearly all reproductive tasks such as fetching fuel wood and water, cooking, washing, cleaning and child care. In most cases, men are the heads of households and are therefore the principal decision makers in the household although some consultation with women may take place.

The gender-sensitivity of policies, investments, and interventions for small-scale irrigation also influences the extent to which women participate in and benefit from various systems for small-scale irrigation. For example, investments in water infrastructure at multiple scales, such as dams, irrigation schemes, and tube wells, may change land and water use patterns and use rights in ways that may negatively affect women by not meeting their specific land and water needs or by negatively affecting their labor burden [5].

Therefore, this paper seeks to explore disparity between male and female headed households' involvement in small scale irrigation agriculture and to assess the challenges and opportunities in small scale irrigation utilization by gender in the study area.

RESEARCH METHODOLOGY

Sampling technique and sample size determination

Multistage stratified sampling design was used to select the respondents. First, Alamata woreda was purposively selected because of its potential for access to irrigation. In the second stage Kulugzie lemlem and selam bekalsi kebelles were selected purposively by considering the irrigation potential and its representativeness in reflecting the realities of small-scale irrigation users in the district. In the next stage sample respondents were stratified in terms of sex into male and female headed households. Finally, 130 households consisting of 80 male and 50 female irrigation users were selected using simple random sampling technique from the specified peasant associations.

Data type and sources

Both quantitative and qualitative data type was collected from primary and secondary data sources to obtain the necessary information for the purpose of the study. To generate the required primary data from different primary sources, research tools such as household survey questionnaires, key

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informant interview, and focus group discussions was employed. The secondary data sources used in this study was both hard copies and online materials which included published and unpublished materials, books, Journals and reports [6].

Methods of data analysis

It was employed to explain the demographic and socioeconomic behaviour of household characteristics. Primary data collected from individuals through the interview schedule was analysed using descriptive statistics such as measures of central tendency, frequency, percentages, and ranking with the use of Statistical Package for Social Science (SPSS). Data that was obtained from key informant discussion and other qualitative data were analysed in qualitative way.

RESULTS AND DISCUSSION

Gender involvement in small scale irrigation agricultural activities

Participation in irrigation management practices is very crucial to improve the productivity of small-scale irrigation agriculture. The main irrigation management practice carried out in the study area includes; land clearing, cultivation, planting, crop watering, removing weeds, hoeing, agro-chemical application, harvesting and transport (Loading and unloading). Since the main criteria for the division of labor in the study area is sex, women and men in Alamata District have separate labor roles which they play in small scale irrigation agricultural activities. In this subsection, heads of the households were asked about the major activities performed by all the family members to see whether irrigation system is gender oriented or not. The major productive activities by the family members were ranked according to the number of men/male and women/female family members participated in the activities. According to the key informants, FGD and household survey both men and women take active part in irrigation practices in the study area but there are divisions of tasks between them. Group discussion results indicate that, currently in the study area, there was a sign of improvement and progress towards sharing responsibilities among husbands and wives in decision making on households' resources and productive activities. This change was observed because of government and nongovernmental organizations intervention and subsequent awareness created through different mass-medias and community meeting.

Deciding what, when and how to produced

In MHHs, about 68.75% and 31.25% of the decision on what, when and how to produce was undertaken by male heads alone and jointly (heads and housewives) respectively. In the case of FHHs, all decision was solely undertaken by female heads (100%). The statistical analysis showed that there was significant difference between male heads and female heads with regard to deciding what, when and how to produced ($P<0.001$).

Seed, fertilizer and chemical purchasing and application

In the case of Seed, fertilizer and chemical purchasing for different crops and application, the head of households have a great role to take major decision which was about 82.5% and 85% by male and female heads respectively whereas the rest portion of decision, which was about 17.5% in MHHs were undertaken jointly. The same is true for female headed households where about 15% of decision on Seed, fertilizer and chemical purchasing for different crops and application was undertaken by both female heads and sons in which there were elder sons in the family. The statistical analysis showed that there was significant difference between male heads and female heads with regard to Seed, fertilizer and chemical purchasing for different crops and application ($P<0.05$).

Land clearing

Land clearing is one of the most labor intensive irrigation management practices in the study area. It was identified that the male heads are involved 46% in land clearing management activity whereas female heads are involved 22% in this management activities. The statistical analysis showed that there was significant difference between male heads and female heads with regard to land clearing activities ($P<0.001$).

Planting

Survey result indicated that similar to that of land clearing,20% husbands, 38.75% head and wives, 33.75% boys and girls and 7.5% hired laborer's in MHHs and; 42% heads, 38% Boys and Girls and 20% hired labour were more responsible in planting activities in FHHs. This shows that high number of female heads respondent participate in planting activity. The statistical analysis showed that there was significant difference between male heads and female heads with regard to Planting activities ($P<0.001$) [7-13].

According to the wives of the MHHs: We have equal contribution with our husbands regarding agricultural production activities, especially in vegetable production, in addition to our reproductive role in our homes such as planting, wedding and harvesting this is because area for production of vegetable is small and intensity of land preparation was low.

Watering

A plant requires water for growing and periodic watering for irrigable crops is indispensable. In view of that, higher proportion of respondents has taken in crop watering activity. About 42%, 21.5% and 36.5 % contributed by head, both head and wife and boys and girls respectively that male heads respondents participate in crop watering activity while 20%, 50% and 30% of head, boys and girls and hired labor respectively of female heads respondents participate in the same activity. The chi-square test result indicated that, there was significant difference among male heads and female heads in crop watering ($P<0.05$). Therefore, most of female heads respondents have to get labor contribution from adult male members in the household or hire labor from outside for this activity.

Weeding

During the weeding process, In MHHs, about 16.25% and 36.25% the respondents revealed that Weeding is undertaken by male heads alone and jointly (heads and housewives) respectively. Boys and girls contributed 28.75%, 18.75% were undertaken hired labour. In case of FHH the role of female head in weeding activity 44%, the rest 31% and 25%were contributed b boys and girls and hired labour. The statistical test shows that there was significant difference between two groups with regard to removing weeds activity ($P<0.05$). This implies that most of the remaining male heads respondents indicate that they apply this management activity for women members in the house or hired labor.

Disease and pest control

The application of chemicals is exercised from the knowledge they gained through experience or occasional trainings. Accordingly, 45% of head, 46.25% of elder boys and girls and 8.75% of hired labor in male heads irrigation users participate in chemical application while only 14% of female heads irrigation users apply chemicals. The rest portion of female heads respondents applies agro-chemicals with the support of adult male members of the household or they hire labor.

During key informant interview

The women believed that pesticides are not really toxic and are not aware that no matter how much more pesticide is used, it does not make it more potent. A chemical to control diseases and pests requires technical skill and labor since it is often difficult for women to hold and operate the sprayer. Besides, female heads suspect chemical has terrible smell which might influence the reproductive organs of women. On the other hand, irrigation users (especially women) are less capable to identify the symptom of pests and diseases so they applied chemical during mornings and night by speculation. Therefore, female heads do not want to take such risk in management activity.

Harvesting

In harvesting activity also 16.5% head 36.5% head and wives, 27% boy and girls and 20% of hired labour in MHH and 52% head, 26% boys and girls, and 22% of hired labour in case of FHH. In the study area both husbands and wives do the harvesting together to do the work faster and to lessen the burden for cash crop but levels of women's involvement in harvesting is much higher than men's. This shows that majority of female heads are involve in this activity. The statistical analysis showed that there was significant difference between male heads and female heads with regard to crop harvesting activity ($P<0.05$).

Transporting and selling the product in the market

In both male and female headed households, almost all family members were an active in participants in transporting farm products to market from far distance using donkey, donkey pulled and man power. The present results show that men play very little role in the marketing of home garden products except for cash crops. The chi-square test result showed that, there was significant difference ($P<0.05$) between the two groups with regard to loading and unloading activity. Majority of male headed irrigation users sell their product at farm gate [14-16].

During FGD with MHH: Marketing of farm products, especially vegetable marketing is almost entirely done by the women. The main reason for this is that the crop in small amount is mostly taken to the market at market day when the women want to buy small commodities such as salt, food and light oil and sugar for household consumptions. Woman-to-woman interactions result in better transaction and as such most men often consign their farm produce to their wives to sell (Table 1).

TABLE 1

Gender role on listed management activities (%)

	MHHs (n=80)				FHHs (n=50)		
Management activities	**Head (husband)**	**Both head and wife**	**Boys and girls**	**Hired labour**	**Head**	**Boys and Girls**	**Hired labour**
Deciding what, when and how to produced	68.75	31.25	-	-	100	-	-
Seed, fertilizer and chemical purchasing	82.5	17.5	-	-	85	15	-
Land clearing	46	18	26.25	9.75	22	48	30
Planting	20	38.75	33.75	7.5	42	38	20
Watering	42	21.25	36.25	-	20	50	30
Weeding	16.25	36.25	28.75	18.75	44	31	25
Disease and pest control	45	-	46.25	8.75	14	56	30
Harvesting	16.25	36	27.75	20	52	26	22
Transport to the Market	22.5	26.25	35	16.25	21	42	37
Selling the product in the market	28.75	43.75	27.5	-	78	22	-

CONCLUSION

The main irrigation management practice carried out in the study area includes; land clearing, cultivation, planting, crop watering, removing weeds, agro-chemical application, harvesting and transport (Loading and unloading). Since the main criteria for the division of labor in the study area is sex, women and men in Alamata district have separate labor roles which they play in small scale irrigation agricultural activities. Most of the time FHH irrigation users are more involved in irrigation management activities such as planting, removing weeds, harvesting and selling products while MHH participate in heavy and risky tasks such as land clearing, cultivation, crop watering, chemical spray and transport products.

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AUTHORS' CONTRIBUTION

Workie Sahlu was involved in literature search, figures, development of overall research plan, study design, data collection, data analysis, data interpretation hypothesis generation and idea development, she provided the validated questionnaires; Moges Girmay was involved in data collection, data analysis, data interpretation, supervision and data analysis and revision of the paper; and he wrote the paper.

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