GENDER, IRRIGATION AND LIVESTOCK: EXPLORING THE NEXUS

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One of the guiding principles of ILRI is to incorporate gender analysis in research activates, identify the needs of women and address their marginalized status in view of the vital role they play in agriculture in the developing world and their effectiveness in channeling benefits to their families. The gender policy of the Government, of Ethiopia, among other things, aim at: "Promoting the full involvement of women in the planning, implementation, decision making and training as well as empower them to play a leading role in self-reliance initiatives" (MWR 1999). Also, the government's livestock water supply policy attempts to:

- recognize that livestock water supply is an integral part of the overall water sector and incorporate its development plans with comprehensive water resources management undertakings;
- promote the availability of water nearer to pasturalists as much as possible by providing livestock water supply to all the regions, particularly to the lowland areas;
- foster sustainable development, efficient operation and maintenance of livestock water supply systems.
- harmonize and promote the "user pays" principle with the willingness and ability to pay for livestock water supply.

Three related questions emerge from the foregoing passages. First, to what extent has ILRI incorporated gender analysis in research activities and identified the needs of women? Two, to what extent are rural women empowered and involved in the management of community –based initiatives (such as irrigation schemes) and benefited from undertakings? Third, to what extent is the livestock sub-sector integrated into the design and development of water works in general and irrigation schemes, in particular? In a nutshell, one wonders how increased supplies of water (as mediated through improved livestock production) impact gender roles and household livelihoods. Therefore, in connection to the nexus between irrigation, livestock, and gender, it is important to investigate the research issues: a) who does what? b) whether women have gained access rights to irrigated land and water; c) whether women effectively participate in the management of irrigation schemes; and d) whether women have effectively benefited from irrigation facilities and e) what factors constrain improvements in the social and economic stalus of women with respect to irrigation facilities.

Evidently, these questions are little researched. To the best of my knowledge, there has been no research focusing on the nexus between gender, irrigation, and livestock. In the research process not enough attention has been given to the collection and compilation of gender disaggregated data.

The purpose of this paper is to address the issues addressed above with particular references to the following specific objectives (see t.o.r.).

- to investigate gender-specific roles in relation to the introduction of community-based irrigation systems in selected areas of central Ethiopia.
- to identify and explain the gendered impacts of irrigation schemes.

- to explore the links between livestock and water and draw policy implications for improved status of women in the household and the community.

The data required for this study can be classified into the following broad categories: a) background information; b) irrigation schemes and their impacts; c) gender relations; d) livestock production; and e) health problems of the study areas.

The study is based on the case study of three1 sites. Two irrigation schemes and one ground water project are selected to undertake detailed investigation of the links between water, livestock, and gender. The irrigation schemes are Godino (which is located some 15 kms from Debre-Zeit) and Doni (located about 50 kms from Nazreth). The other study area is Teddie-Dildima kebellie (located five kms to the east of Mojo town). The latter was selected as a study area because of its interesting relevance to the purpose of the study. Teddie-Dildima has two large water tankers which provide drinking water for livestock as well as for humans. The study sites were more or less representative of alternative irrigation technologies used in the mixed farming system of the central highlands and in the production of horticulture in the Upper Awash Valley. Moreover, the study sites have varied in terms of access to markets, evolution of livestock production systems, and cultural backgrounds.

Data and information for the study were collected through a household survey and focus group discussions2. The household survey covered 120 households randomly selected from the sites, where irrigation schemes were implemented. Equal numbers of men and women were covered by the survey. The purpose of the household survey was to investigate impacts of irrigation schemes on women children, and other members of the household. The groups consisted of: a) elders and religious leaders, b) female-headed farm households; c) housewives; and d) young and middle-aged farmers. Each focus group consisted of three to seven persons. A total of 149 persons were involved in a series of focus group discussion. Key informants were interviewed concerning specific issues such the physical and economic backgrounds of the study kebellies, irrigation profiles and health situations. In addition, useful information was be gathered through visits of local market places.

i. Irrigation and the Adoption of New Technologies

The major findings and policy implications of the study are summarized below.

Irrigation schemes are widely adopted by both male and female farmers in Doni and Godino. In both cases, it is the availability of river water (i.e. the rivers Awash and Wudecha) which influenced the decision to construct irrigation schemes. In areas where river is not readily available, community-based irrigation schemes are found to be too costly to construct. In Teddie-Dildima, the community, in collaboration with an NGO, constructed two water tankers, using ground water. But, the community could not build additional tankers because of the unbearable costs of construction. Individual farmers, like Ato Bahiru, began to harvest water by taking advantage of opportunities available in the area in line with the government's policy of promoting water harvesting technologies.

However, the adoption of water harvesting technologies has been constrained partly because of the high cost of construction (about birr 5000 per structure). Thus, a major policy issue is how to put in place cost-effective ways of mobilizing water resources. It is worth investing in appropriate water works. Available evidence suggests that irrigate farms are profitable. In fact, some women were able to move out of poverty thanks to increased availability of water.

Considerable wastages of water are observed in Godina and Doni. Drip irrigation (a very efficient technology) was practiced only in connection with a water harvesting structure. Therefore, it is high time to explore technological options for devising efficient ways of using available water.

Complementary inputs (such as extension advice, chemicals and credit) are lacking or are inadequate. For example, in Doni, no pesticide was available to control pests that attack the roots of onions. In particular, female farmers get limited access to new female technologies. Perhaps, women may need targeted subsidies and other support scheme to improve access to new technologies.

With the exception of water troughs installed in Teddie – Dildima, no attempt has been made to integrate the livestock sub-sector into the design of water works. Of course, drinking water has increased in irrigated areas. But, animals were able to of an inefficient technique of water transmission (i.e. flood irrigation, which caused wastages of water). Get more water for drinking not by design but because. Therefore, irrigation schemes should be redesigned in such a way that the need of the livestock sub-sector is integrated with crop production.

ii. Animal feeds and drinking water

Irrigation, coupled with other factors, has contributed to significant decline in grazing lands in the study areas. Farmers have responded to the decline in grazing lands in different ways, including: reduction in herd size (per household), a switch to the use of crop residues, increased use of purchased feeds, and gradual switch to stall-feeding practices. Regarding the effects of drinking water on the productivity of animals, an interesting finding was reported. In Godino and Doni where water supply is high (thanks to the irrigation schemes), farmers were of the opinion that increased water supply might not bring about increased productivity of animals. This contrast with opinions in Teddie-Dildima, where there are shortages of water. Here, farmers were of the opinion that animal productivity would increase if the drinking water were increased.

iii. Health and Environment

Irrigation schemes can contribute to improved health status through: a) in creased supplies of animal products; b) indirect entitlement to food (i.e. improved purchasing power resulting from increased cash income); and c) access to more balanced diet as vegetables are increasingly consumed. Evidence from fieldwork suggests that some households might have experienced improvements in their health status.

However, there are indications of negative health and environmental impacts of irrigation schemes covered by the study. Some of these impacts included: a) possible salivation of the soil in Doni; b) the spread of water- borne diseases (such as malaria); and c) contamination of water resulting from pollution caused by livestock and household refuse.

iv. Women's access to resources, decision making and division of labour

In discussing gender issues, it is important to make a distinction between two categories of women, i.e. those operating as housewives and those heading households. In other words, there are important differences between conjugal households and female-headed households. In the latter case women: a) are farmers on their own rights; b) are more empowered than housewives; c) are excessively over burdened with work because they shoulder primary responsibilities for farm activities and housework and d) are usually poorer than women in conjugally – based households. Therefore, it is important to make a distinction between the two categories of women in designing irrigation schemes.

There was no strong evidence of systematic discrimination against women. Most of the biases against women are determined by cultural factors and lack of education and training facilities. Policy makers should focus on education and training facilities for female farmers.

The findings of this study reinforce the hypotheses of the unitary model of the household, although the collective model cannot be ruled out altogether. Accordingly, the following hypotheses emerge from the study:
In many cases resources are jointly accessed and decisions are jointly made by husbands and wives. A group of housewives summed up their argument by saying "yesu yene new; yene yesu newu" ("his is mine; mine is his").

i. It appears that women market low value products, while men market high value products. Most animal products are marketed by women. But, most often the proceeds are used for common purposes, although there are possibilities of exclusive control of income by irresponsible or dictatorial husbands.

Women are involved all types of farm work except plowing, broadcasting of seeds (for cereals), and mowing of tef. As usual housework falls within the domain of women. Most tasks related to animal husbandry are shared by both sexes. Exceptions are: a) milking and the processing of dairy products, tasks which are left to women and b) plowing of fields (a task which falls with the domain of adult males).

Women's participation in community-based organizations is limited. In the study areas, the executive committees of water users associations were dominated by men. But, there were women participating in the administration of kebellies.

It is likely that, whenever water is rationed female- headed households are likely to be the least beneficiaries. Evidently, conflict often arises during the dry season, when irrigation

water is in short supply. Some women complain about unfair distribution of water among users. Some leaders of water users associations are accused of favoritism and unfair treatment of weaker members.

v. Gender and access to markets

Price instability and lack of market are almost invariability confirmed as conspicuous major constraints to irrigated agriculture covered by the study. In Doni, farmers are no more allowed to take their produce to market centers in Addis Ababa. Therefore, they are at the mercy of traders exercising localized monopsony. Marketing cooperative were conspicuously missing or proved to be too ineffectual to reduce risks arising from price instability and marketing problems. Similarly, credit facilities were not readily available in the study area. Perishable as they are, vegetables and milk cannot be stored at the farm level awaiting price increases. In the absence of the necessary marketing facilities and infrastructure, farmers have no choice but to dump their produce at prices that may not cover costs of production. Female headed households, who often rent out their land (due to shortage of adult male labour), are the hardest hit whenever marketing problems arise. But some women, like Gete Kumbe, could successfully tackle marketing problems.

Women's participation in markets differed depending on: a) the value of the commodity to be marketed; b) the purpose for which a good is purchased; c) division of labour in the production of marketed product; and d) the categories of women engaged in marketing. In general, high value products, such as cattle, are marketed largely by men, while low value products such as chicken, eggs, and butter are marketed by women. However, women heading households, with assistance from an adult male, can sell or buy high value livestock such as draft oxen. It appears that goods destined for crop production, such as farm inputs (e.g. fertilizer), are purchased by males, while goods meant for household consumption (e.g. food) are often purchased by women.

The prevailing gender division of labour can influence the extent to which women can participate in markets. Women tend to market goods in the production of which they play a primarily role (e.g. butter, vegetables from backyard farms). From what we observed during the fieldwork women heading households enjoy more independence, than housewives, regarding market participation. Because they are the breadwinners, female household heads tend to buy or sell products traditionally falling within the domain of men, though they often need assistance from adult males.

vi. Impacts of irrigation schemes

Irrigation schemes have created employment opportunities for men and women. In particular, female-headed households were the primary beneficiaries of expanded labour market in Doni. The multiplier effect of wage labour is obvious.

The likelihood of animal productivity increases is strong regarding some households. Crop residues are extensively used by some households. The supply of drinking water has significantly increased in Doni and Godino. Some households can afford purchased

feeds. It is likely that time invested per animal increased (i.e. more care and attention given to the few animals kept by a household).

Environmental concerns in the study areas included a tendency towards monoculture; possible salivation problems in Doni; erosion resulting from flood irrigation in Godino and Doni; and possibilities of localized depletion of ground water in Teddie-Dildima.

Health concerns included prevalence of water-borne diseases in Doni and Godino; possible health problems arising from increased consumption of sugarcane; and possible contamination of drinking water (e.g. improved diets and increased medical attention). However, there were positive health effects (eg. Improved diets and increased medical attention). For example, because of increased production of vegetables, more balanced diets could be available. In Teddie-Dildima, a considerable number of household are able to drink potable water. With increased cash income, some household could afford more medical expenses. In Doni, it is likely that the nutrional status of children improved resulting from increased consumption of milk.

Therefore, it is important to appreciate that a project that targets the household may not necessarily discriminate against individual household members. What is good for the husband may often be good for the wife and children. By way of conclusion, we note that:

In a nutshell, we can tentatively conclude that irrigation schemes have contributed to improved livelihood of households in the studies areas in general and in Doni in particular. Positive achievements are registered in terms of: a) increased cash incomes for women; b) increased consumption of milk by children; and c) increased participation of women in marketing activities. These changes are brought about through increased drinking water for animals and increased supplies of crop residues.

However, life has been far from being rosy for women and children in the study areas. Because grazing areas were reduced, time required to feed animals had to be raised. Some households have already exhibited noticeable tendency towards stall feeding of their essential animals. In addition, women were increasingly engaged in farm work both as labourers and as family workers. Irrigated agriculture is likely to raise women's work burden. In particular female-headed households are likely to be overburdened with work.

From the foregoing we can infer that the design of irrigation schemes should incorporate all the major uses of water, in addition of water supplies for crops. Accordingly, policy makers and water engineers need to look for most efficient and sustainable ways of planning for increased water supply for: a) cash crop production; b) domestic use; and c) drinking animals. Otherwise, unexpected competition over water may increase over time.

In the study areas, drink water was simply a by-product of irrigation water. As a result, some households drink impure water that has been brought to their fields through canals. In addition, animals do contaminate the water.

Further research is required to formulate and implement an economically viable and gender sensitive water resource development policies. More information 15 required to explore possibilities of developing a multisectoral water resource development policy that would cash crop (i.e. vegetables) production with livestock production, sanitation, women's empowerment and environmental sustainability. We believe that progress towards the millennium development goals is pertly determined by the extent to which policy makers address the multidimensional aspects of rural poverty.