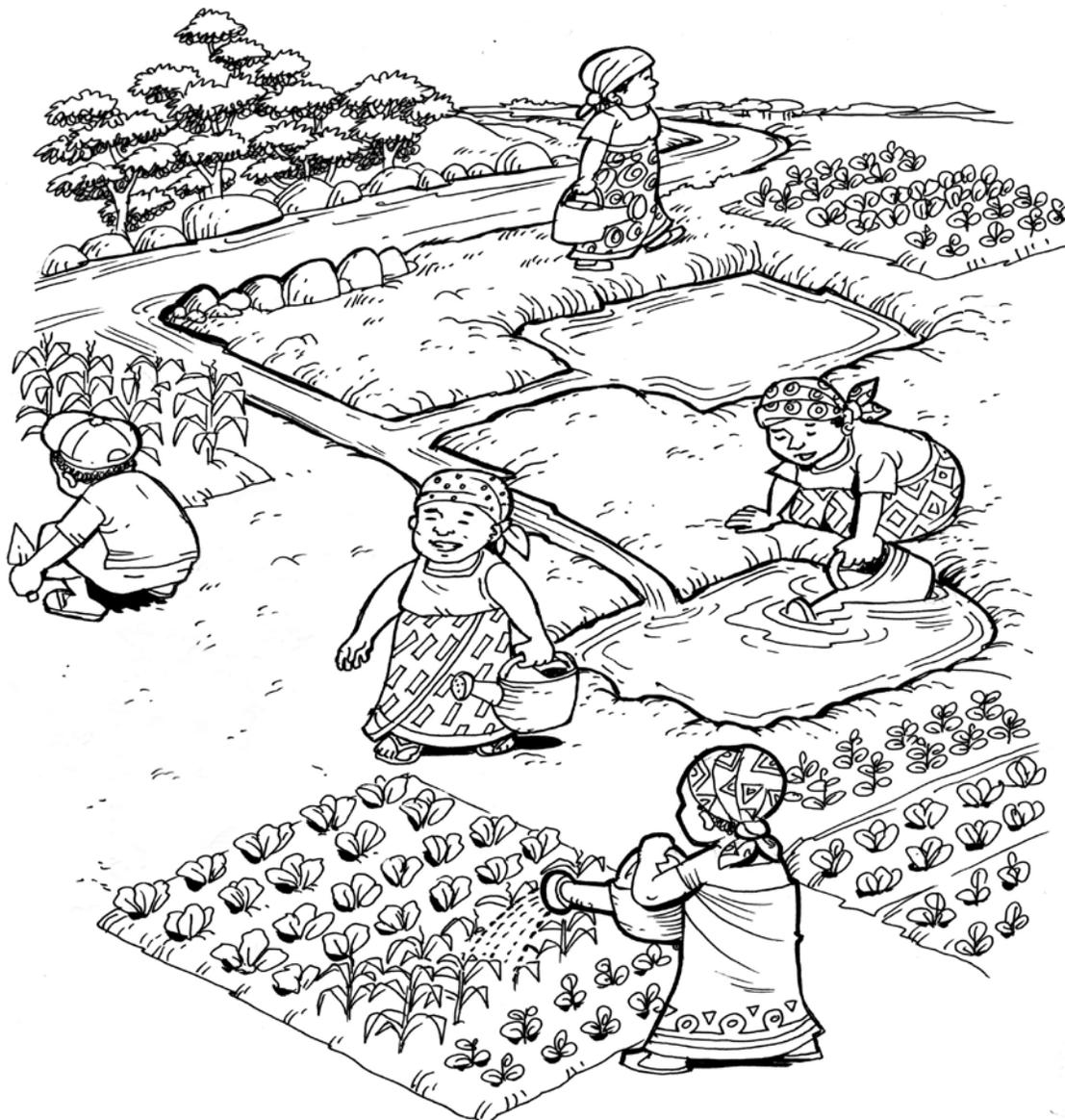


Gender Issues Related to the use of Groundwater Irrigation Technologies



The Upper East Region (UER) is one of the poorest areas in Ghana. The area is semi-arid and the population mainly depends on subsistence agriculture. Increasing market demand for vegetables in the urban centers of southern Ghana, within the past 15 years, has triggered the farmer-initiated introduction of groundwater irrigation technologies, such as

temporal and permanent shallow wells and riverine alluvial dugouts for dry-season irrigation. Yet, identifying the linkages between irrigation, food production and poverty alleviation for all local stakeholders requires a clear understanding of how men and women contribute to and are affected by irrigation development. The International Water Management Institute (IWMI) examined

the gender dimensions of participation in the use of three groundwater irrigation technologies and in decision-making. It assessed how social relationships shape opportunities for the control of resources and investments and the sharing of costs and benefits. Important factors determining who can and who cannot participate and profit from irrigation are rights to land and water, inheritance, local leadership, intra-household relationships, credit and market conditions (INPIM 2007).

The focused on two communities where the use of groundwater for irrigation was prevalent:

1. Anateam in Bolgatanga District, where riverine alluvial dugouts (RADs) and temporal shallow wells (TSWs) are predominant.

Irrigation development in the Upper East Region

- ◆ 1950s-60s: construction of small reservoirs and dugouts
- ◆ 1970s-80s: construction of two large reservoirs for irrigation (Vea and Tono)
- ◆ Early 1990s: alternative irrigation technologies, such as permanent and temporal shallow wells introduced; riverine alluvial dugouts initiated and expanded by farmers in the White Volta sub-basin to increase vegetable production; rapid development of these technologies also influenced by affordable pumping technologies from India and Pakistan in the mid-1980s (Shah 1993).
- ◆ Current Status: UER has 156 small reservoirs (IFAD 2005) mainly used for domestic purposes, livestock keeping and crop production; government and NGOs are developing more irrigation systems.
- ◆ Crops cultivated under irrigation include rice, tomato, pepper, onion, cabbage and lettuce.

2. Telenea in Kasena-Nankana District, where permanent shallow wells (PSWs) and TSWs are predominant.

Field methodologies for data collection were as follows:

1. Focus group discussion with men and women farmer irrigators
2. Field survey with women farmers
3. Key informant interviews with village chiefs
4. Regional workshop to get feedback from stakeholders from four districts (Bolgatanga, Bongo, Kasena-Nankana and Kasena-Nankana East) in the study area, with representatives from district assemblies, the Water Resources Commission, and NGOs involved in irrigation development (e.g., Red Cross).

Gender dimensions in groundwater irrigation technologies: Some highlights

Land and water rights

There is a multitude of extremely complex land tenure and management systems in Ghana (Kasanga and Kotey 2001). There are more than 80 formal legal instruments regulating land tenure, some of which are contradictory. They co-exist with various forms of customary land tenure. For instance, the tribes in the study areas within northern Ghana believe that land is held in sacred trust for the ancestors. To them, selling their land is a sacrilege. Farm households are allocated 'family

land'. Local farmers do not own this land from a legal perspective and cannot sell it, but they have secure usufruct rights to this land (Birner *et al.* 2005). The usufruct rights can be passed on to the descendants by inheritance so that land tenure is secure for as long as the land is cropped. When the land is fallow, the *tendana* can redistribute it. A *tendana* is an established local authority, such as a priest or a village chief, responsible for looking at land issues. A part of the farmers' harvest is given to him as rent, in recognition of his authority.

Usufruct rights have considerable social implications. Unless the occupier of the land stands in breach of the chief or the *tendana*, he cannot be deprived of his usufruct rights.

The increase in population density tends to decrease available land for the growing population. Smaller households, which do not have enough labor to cultivate their own land, can lease part of their land to their neighbors or relatives. Land security is assured for usufruct rights holders, though not for migrant farmers.

Land rights are linked to water rights. A person who holds the rights to a plot of land is allowed to tap groundwater beneath that plot of land (Lentz 2006). Surface water, however, is considered a communal resource that is freely and openly accessed, in adherence to communal water use rules (FAO 1998, Ministry of Works and Housing 1998).

Access to land and water

It is customary in the UER to consider inheritance of land as patrilineal and the traditional laws do not recognize usufruct rights for females. Women have only indirect land rights—they access land through a male member of the family. The only exception is if a household is headed by a female, in which case,

they can request land from the *tendana* (Birner *et al.* 2005). Typically, women can temporarily use their husband's land. Unmarried women seldom have access to land, and widows lose access unless they have male children. Women with resources can rent land to farm. However, women are usually given small plots that are farthest from water sources or are least productive (IFAD 1998).



The table shows that RAD technology is male-dominated. The RAD technology appears unfavorable to women due to capital intensiveness, full-time demand and land tenure limits.

The ownership of PSWs is directly linked to land ownership, which is dominated by men who own the irrigated plots. Women mostly support their husbands in the watering, harvesting and selling of produce. About 15% of the males have developed separate PSWs for their wives to use for irrigation.

Traditionally, land areas along the river channel are owned by heads of families who hold it in trust for their families. Heads of families are elderly men who do not have the physical strength to do dry-season irrigated farming. Young people engage in dry-season irrigated farming, but they do not own or lease land. They can, however, rent land, although preference is given to males rather than females. People believe that men can cultivate larger areas than females can, although the

Table 1. Gender roles vis-a-vis types of groundwater technologies and management method

Management system	Practical description of gender roles	Occurrence rate per study area (% of total use per type of technology)		
		Permanent shallow Wells (PSW)	Temporal shallow wells (TSW)	Riverine alluvial dugouts (RAD)
Female	Woman decides on plot size and crop type, buys inputs, sells products and keeps all sales. She owns the technology. Men and children keep watch over crops.	About 10%	About 15%	Less than 5%
Male	Man decides on plot size and crop type, buys inputs, sells products and keeps all sales. Wives and children contribute labor. He owns the technology. Men keep watch over crops.	About 50%	About 50%	About 95%
Mixed/ separate plots	Man develops (digs wells and clears land) two separate plots, one for himself and one for the wife. Man nurses seeds for both plots and purchases farm inputs for both plots. Man refers to wife's plot as belonging to his wife, even though he invested. Individual plots managed separately, with each other providing mutual support. Man and woman each irrigates, harvests and sells his or her products separately. Man takes an amount of money from the woman's profits to buy inputs for the next season. Men keep watch over crops.	About 10%	About 15%	Not observed
Joint/ one plots	Man decides on plot size. Crop type decided by both, man buys inputs, both are responsible for watering, both harvest, both sell, woman takes a third of sales, man gets two-thirds. Woman cultivates other crops meant for domestic use. Both invest but man owns the technology. Men keep watch over the crops.	About 30%	About 10%	Not observed

women are more reliable rent payers. Women who are interested in renting land have to negotiate through their husbands, while female heads of families and unmarried women hire laborers. Some women were eligible to negotiate for engagement in dry-season farming have been successful.

Women and children learn how to irrigate and manage their own plots by working as laborers in the plots owned by their male head of household. Children take over when the women are away and assist in digging wells and watering. Enterprising women hire young men to help with the digging, irrigating and weeding.

In a mixed system, husbands support the women during land cultivation and provide protection from grazing livestock. At times, they have to depend on their neighbors, children or hired laborers to secure their crops from roaming animals.

Profits are shared between the women and their husbands in the joint system as a sharecropping arrangement—men buy inputs for the next season. Women have the ability to manage their own plots, although this is often subject to the willingness of their husbands to provide support.

Access to irrigation technology

The choice of irrigation technology depends on land ownership, water source, land size, financial capacity of the individual and social support. Those with permanent land ownership rights are able to develop permanent irrigation infrastructure such as PSWs. Those who rent land invest in temporary structures, since some technologies are capital-intensive. Moreover, access to technologies differs between men and women. Women are not able to afford PSWs, unless their husbands decide to build the wells for them. Thus, PSWs are seen to fall under male prerogative. The RAD technology is labor-

intensive, and men form mutual help groups to dig each other's dugouts. Women, on the other hand, do not have the option of forming such groups since digging is done by men; they have to hire laborers.

Women tend to favor TSWs, which are suitable for relatively small plots and are less capital-intensive. They do not require hiring of labor, as much of the work is carried out by farmers and a water-lifting technology (with rope and bucket) is locally available and affordable. With TSWs, women are able to manage their plots, while performing their household duties at the same time.

Access to credit

Access to formal credit for irrigation development in the UER is poor, thus there is minimal difference in the access avail of between men versus women in terms of access to credit. Farmers try other options, such as borrowing from friends, selling their livestock or forming farmer groups to access bank loans. Here, the gender factor is evident. For instance, women are favored by banks and creditors because they are more reliable repayers of loans. Men encourage women to join cooperatives



groups to obtain access to bank loans. This advantage is also one of the reasons women are participating in irrigation. High female participation has significantly increased access to credit.

Organized women's groups

Organized women's groups are located in major markets in Accra, Kumasi and in big cities in southern Ghana. They use trucks to transport vegetables. The irrigation group leaders lead the search for these markets. The women control the distribution. The leaders ensure that group members are served first before the non-members.

Conclusion

The use of irrigation technologies such as PSW, TSW, and RAD is a promising strategy to improve the livelihoods and well-being of the people in the UER of Ghana. To ensure the success of these interventions, it is important to look at the roles of both men and women in the construction and operation of irrigation infrastructure. The role of gender must also be identified in decision-making processes, cost-benefit analyses, gaining access (to land, water and markets), and defining in the social structure.



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