

**Egyptian-German Water Resources Management Reform Programme
(Agricultural Components)**



**Women and Water Management in Egypt:
An Empirical Study**



Ministry of Agriculture
and Land Reclamation

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(Agricultural Components)

Ministry of Agriculture and Land Reclamation

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Abbreviations / Glossary

AWMP	Agricultural Water Management Project (2006-2008): Project of the MALR, financed by the German Federal Ministry for Economic Cooperation and Development (BMZ) with technical support from GTZ aiming to improve services to small-holder irrigation farmers in Egypt's Old Lands
BC	Tertiary or Branch Canal
BCWUA	Branch Canal Water Users Association
CDIAS	Central Directorate for Irrigation Advisory Services within the MWRI
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH; German Technical Cooperation
IIP	Acronym for Irrigation Improvement Projects of the MWRI, financed by World Bank, the German Bank for Reconstruction and Development (KfW), the Dutch Government and in a particular areas the Japan International Cooperation Agency (JICA), as well as the United States Agency for International Development (USAID) in the early stages of the project. The project-comprises several implementation phases and names (actually ongoing: Integrated Irrigation Improvement and Management Project, IIIMP). Core activity consists in replacing the mobile pumping units on tertiary canals or <i>mesqas</i> by stationary collective pumping stations on secondary or branch canals. Common goal of all IIPs is to replace individual mobile and therefore uncontrollable water abstraction by a controllable and measurable water supply to farmers organised in WUAs, and in doing this, to get back state control over irrigation and agricultural water use
IIP area	Area where individual mobile pumping units have been replaced by stationary collective pumping stations lifting water from the secondary or branch canals to tertiary and field canals. In a large portion of this area, formerly open canals have been replaced by slightly pressurized underground PVC pipelines delivering water to the individual field plots via hydrants and valves instead of breaches or small gates in channel banks
MALR	Ministry of Agriculture and Land Reclamation
MWRI	Ministry of Water Resources and Irrigation
WRMRP	Egyptian-German Water Resources Management Reform Program executed by MWRI (promoting institutional reforms of the MWRI) and the MALR (capacity development of service providers and of farmers organisations), financed by the German Federal Ministry for Economic Cooperation and Development (BMZ) with technical support from GTZ (present phase 2009-2011)
WUA	Water Users Association on Tertiary Canal (<i>mesqa</i>) level

Executive Summary

This study seeks to give an answer to the question: do we know what the current water management situation of women is, what the gender gaps are and how they can be addressed ?

The study was undertaken in the framework of the Egyptian-German Water Resources Management Reform Program (WRMRP), agricultural component, executed by MALR, financed by the German Federal Ministry for Economic Cooperation and Development (BMZ) with technical support from GTZ. It took place in the governorates of Kafr El-Sheikh, Beheira, Qaliubeya, Menufiya, Gharbiya, Daqahliya and Qena. For the study a total of 179 farmers were interviewed, 118 of which were female and 61 male. In addition, interviews were held with 29 officials to obtain their views on farmers' attitudes and characteristics in general and the participation of women in particular.

The following parameters were analyzed:

1. Water management and farming tasks;
2. Access to resources;
3. Knowledge of water management issues;
4. Participation in water management decisions;
5. Local initiatives and solutions;
6. Participation in water user organisations;
7. Gender bias

When it comes to farming and water management tasks, access to resources and local initiatives, the status and situation of women was found to be similar to that of the men and no gender gaps were noted. Women perform the same farming and irrigation tasks as men. Moreover, the notion that women do not irrigate because they cannot start the pump engine (which in general is not equipped with an electrical starter but with crank handle) is incorrect because

a) women do overcome the problem of starting the pump engine in calling a man to assist them; and

b) the task of irrigation is not confined to the pump operation but comprises aspects like deciding when to irrigate (scheduling) and how much water to channel into the field (application rate).

Women have the same access to farming and water management resources as the men. Both are free to purchase their agricultural inputs from the cooperatives and/or local sellers; harvesting and marketing resources are available and accessible to all, as are water management resources such as pumps and land preparation equipment for hire.

Furthermore, the initiatives employed to address water management problems are adopted by both women and men and are meant to benefit all water users with no bias or preferen-

tial treatment towards any gender. Thus, women benefit equally as men from community wells, pump hiring and other local initiatives. Although they do not participate in contacting officials, the majority of the female respondents reported that they were content to defer this task to the men and trusted their actions and opinions.

The biggest difference between the status of women and men was observed in the domain of information. Compared to the men, the female respondents displayed a level of knowledge that was markedly inferior.

Water management decision making is another domain where a gender gap was noted. Although women were found to play a substantial *informal* decision making role in advising their husbands/male relatives on the types of crops to plant, their *formal* decision taking role and participation in collective decisions is negligible, if not absent.

Given this situation, it is not surprising that the role of women in water user associations is non-existent. They do not participate or even know of its meetings, and - in areas where such associations exist - , are not inclined to take up an active role as members.

In general, the female respondents do not complain of any gender bias. If they are not involved in certain decisions, it is not because they are marginalized as women. In fact, most of the female groups proclaimed water management decisions and actions to be the primary responsibility and prerogative of the men; also, many of them do not see any tangible benefits accruing to them from formal participation.

However, in future, women will be obliged to take up a more visible and substantial role in water management. They may not envisage this situation now, but economic factors are pushing them to become *de facto* decision makers and key players in water management.

To prepare them for this inevitable task, three measures are proposed: a) reduce the gender knowledge gap through training of the female water users; b) strengthen or create local structures serving the water management interests of women, and helping them to obtain access to agricultural services and marketing opportunities; and c) revisit the concept of gender as an approach that encompasses men as well as women, and consider participation as a *means* towards tangible benefits that women can recognize.

1. Introduction

“Irrigation is the man’s job. That is the way it has always been. Of course, we [women] help our men in the field; we do everything with them. But it’s still their responsibility.”

Nadia Abdel Ra’ouf, Segal’eya Village, El-Mahalla District, Gharbeya

Participation of women in water management is a strategy that is being strongly endorsed by the Ministry of Water Resources and Irrigation (MWRI). Concepts such as “gender mainstreaming” and “gender equality” have come to comprise substantial components of the MWRI’s work plans and activities, whether the latter are locally initiated or donor supervised.

This is a relatively recent approach. In the 1980s when the MWRI began to implement projects based on user participation – such as the Egyptian Water User and Management Project (EWUP) and the Irrigation Improvement Project (IIP) – the main focus of attention was on “water user” participation in general without distinction of gender¹. Water User Associations (WUAs) established during that period were composed solely of male members; project managers had their hands full convincing even the men of new and unfamiliar notions such as user participation and cost sharing; there was little time and awareness to consider other categories of water users, notably women.

Gradually – particularly with the advent of Netherlands assisted projects such as the Fayoum Water Management Project in 1990 – concepts of female participation and female water management interests began to appear in project plans and separate activities were designed to promote them.

Today, this trend has gained rapid momentum. More and more projects are moving from objectives of gender mainstreaming included within tasks to separate full-fledged activities aimed at enhancing women’s participation in water management; field advisors work intensely to convey gender messages to skeptical and reluctant male farmers; training and capacity building programs are designed and delivered to women to make them speak up in meetings and participate in decision making; other (female) field workers walk from house to house in an effort to mobilize women to nominate candidates for membership in water user and other farmers' associations.

However, some important questions need to be raised. Before embarking on “gender” activities, ***do we know what the current water management situation of women is, what the gender gaps are and how they can be addressed?*** Before hastening to promote gender equality, would it not be appropriate to first find out if there is gender *inequality*? If such inequality is found to exist, then it should be asked: are the women unhappy about it? Do they want to change that situation? To answer these questions, information should first be gathered on the actual roles of female water users, their access to water management resources, and decision making status.

In other words, before implementing activities aimed at promoting female participation in water management, it is important to first assess whether women are *interested* or moti-

¹ See Abdel Aziz, Yehia. Sustainable Irrigated Agriculture: Role of Farmers’ Participation in Egypt. Cairo: MWRI, 1994.

vated to participate, whether they are *able* to participate, and whether such participation would lead to an *improvement* of their water management situation.

This study takes a step back from standard approaches that seek to implement women's participation by asking these fundamental preliminary questions. A baseline overview of the actual tasks that women perform in water management, their role in decision making and their motivation to play an active formal role in this field is imperative before on-the-ground gender activities can be implemented. Knowledge of the current situation of women in water management and the different parameters that govern their participation is an important basis that contributes to a sound practical strategy reflective of women's interests and capabilities.

2. Objective of the Study

Based on the above-mentioned need to investigate the current situation of female water users, the Egyptian-German Water Resources Management Reform Program (WRMRP) financed by the German Federal Ministry for Economic Cooperation and Development (BMZ) with technical support from GTZ focused on the following objectives a) Provide a baseline overview of the current tasks, interests and capabilities of women in water management, their access to resources and their actual role in decision making; b) investigate the potential for active female participation in on-farm water management; and c) assess whether female water users require information or skills that would enable them to assume an active role in water management, and their preferences regarding capacity buildings programs.

3. Study Area

In addition to Beheira and Kafr El-Sheikh where several phases of the Irrigation Improvement Project (IIP) and the Egyptian-German Agricultural Water Management Project (AWMP) have been implemented, the study covers four other governorates in the Delta, i.e. Gharbiya, Qaliubeya, Menufiya, and Daqahliya. In addition, the Upper Egyptian governorate of Qena has been included in the study. An average of three villages was visited in each of the selected governorates. In each village, interviews were held with groups of female and male water users ranging from three to ten per group.

4. Findings

The methodology of the study is primarily based on group interviews held with female and male water users in the seven selected governorates. The perceptions of the water users and their responses are presented below according to the seven parameters employed for analysis of women's status in water management.

4.1 Water Management and Farming Tasks

4.1.1 A Noteworthy Example

Sa'deya has become an expert in dealing with angry barking dogs. Small wonder, since she encounters them everyday as she heads to her field. During the rice season, her day starts before dawn and ends after sunset with plenty of work remaining for the next day.

That is because Sa'deya farms the 33 qirats inherited from her father-in-law on her own. To feed their 4 children, her husband works in a fertilizer company, leaving her to fend for herself alone at the field. But she is not daunted by farming.

“Each day, I walk to the field on my own with dogs barking at me on either side of the road. The best way to avoid their anger is to ignore them,” she said. *“The mosque sheikh calls for the dawn prayers as I bundle my rice. I do everything at the field. I wear a pair of trousers underneath my galabeya so I can lift it when I’m planting my rice seedlings. I have a pump which is heavy for me to operate; so I call on my neighbor [at the field] or any passerby to do it for me. If there’s anything I need to ask about farming, I ask my husband or neighbor.”*

Sa'deya Hassan Atta, El-Safayna Village, Toukh district, Qaliubeya governorate

4.1.2 Perceptions of the Water Users

When asked, both female and male water users acknowledge the important role of women in farming and water management.

4.1.2.1 Farming Tasks

Within development circles, two common perceptions prevail:

1. Although women participate in farming, their roles are mostly confined to light manual work such as weeding and harvesting;
2. Women do not plant rice seedlings, as this requires them to lift their garments in the water, an act that is socially unacceptable and considered shameful;

The findings of the study disprove such perceptions.

“Women do everything”

First, women – especially in the Delta region – perform almost all farming tasks, including planting of seedlings, placement of fertilizer and bundling of wheat and rice. Of the female water users interviewed, more than 72% (85) admitted to this fact.

“In farming we [women] are worth 100 men,” said Fayza El-Sayed Saleh from Dalgamon village (Kafr El-Zayat district, Gharbiya governorate), who farms 3 feddans inherited from her late husband’s father. *“We do everything. We work with the axe, we bundle rice, we ride tractors like the men. Isn’t the land our daily bread? If it needs heavy work, we will do it.”*

In some areas called “conservative” by its local inhabitants, the women stated that heavy farming tasks are either done by their husbands or by day laborers. *“If a farmer has more than 1 feddan and can afford to hire workers, then he would relieve himself and his wife of heavy tasks like preparing the land and bundling rice. But if the size of his land is smaller, this would be costly for him. So he does it by himself and his wife helps him,”* said Hadwo El-Serr Abli Abdel Aati from El-Sega’eya village (El-Mahalla El-Kobra district, Gharbiya governorate), who together with her husband is a tenant on 3 feddans.

Women plant rice seedlings

Second, women participate heavily in rice planting. Of the female water users interviewed, 23% (27) said that they perform this task with no shame. *“All of us [women] plant rice. In fact, everyone says that women do a better job of planting rice seedlings than the men because they are more accurate and place them in straight furrows,”* said Fayza Saad Mohamed, a tenant on 2.5 feddans in Ezbet Salah hamlet (Sidi Salem district, Kafr El-Sheikh governorate).

Again, those women who declared that they do not plant rice seedlings (18 - 15%) have cited the availability of day laborers to do this job or their husbands. As Rasha Saad, a young woman from Meet El-Faramawy village (Meet Ghamr district, Daqahliya governorate) who farms her mother-in-law’s land, explained: *“Here we don’t plant rice seedlings because day laborers are plentiful. But I know of many widows who own a few qirats and who can’t afford to hire workers. These women go into the water and plant their rice seedlings and bundle their rice when it’s ready to be harvested.”*

More and more women are taking up farming

One of the most important findings of the study is the fact that an increasing number of women are involved in farming. This observation is not confined to widows and other women who farm the land on their own. In fact, many of the groups who admitted to planting rice and performing other tasks formerly reserved for males are farmers’ wives and relatives.

The main reason for this is explained by Hassan Abou Gazia, Head of Extension Programs Section at the Kafr El-Sheikh Agricultural Directorate: *“Farming is no longer a lucrative activity. The prices of agricultural inputs have gone up and those of crops have gone down. To make ends meet, more and more men are taking up jobs as employees or day laborers in factories. Others immigrate to the Gulf countries, leaving their women behind. This leaves the women to do most of the work. And because most landholdings in rural Egypt now are small, farmers find it unaffordable to hire workers and so end up doing most of the work themselves.”*

Interestingly, of the male groups interviewed, more than half (33 – 54%) admitted that they have abandoned their lands by renting them out or taken up paid jobs; these men work their lands in the afternoons, weekends or other free time.

Farming is sometimes considered a shameful activity

Although as mentioned above women play a substantial role in farming, in many of the study areas they were reluctant to admit this fact. This was observed both in the Delta governorates as well as in Qena.

An interesting conversation took place between two female farmers in Kafr El-Sohbi village (Shebeen El-Qanater district, Qaliubeya governorate). The conversation took place between Fadya Mohamed Tantawi who farms 15 qirats with her husband and Nagat Hamed Mohamed Saad, a widow who inherited and farms 9 qirats from her husband:

Fadya: *Women here don't farm. It's eib (not respectable)*

Interviewer: *But you just said you helped your husband with the land.*

Fadya: *Yes, but I only bring food for the workers and take home some barseem [alfalfa] with me. That's all. He does the rest or we hire workers. It's eib for a woman to bend over and work the land. Besides, if her husband is well-off to hire workers, why should he bother her with such menial work?*

Nagat: *What is this that you are saying? Don't believe her. I see her all the time planting seedlings and bending over to weed. Why don't you tell the truth? There's no shame in akl el-eish [one's daily bread].*

Fadya did not respond and was silent throughout the rest of the interview meeting.

The main reason for the stigma attached to farming is that it is perceived by rural inhabitants in Egypt to be a male domain, the responsibilities of which can be taken over by women if landholdings are too small to warrant the hiring of laborers or if the family is poor. As explained by Hanem Mostafa Shaltout, Rural Development Specialist at the Extension Center in Dalgamon village (Kafr El-Zayat district, Gharbiya governorate):

"Most of the women who work the land own or help their husbands farm lands that are less than half a feddan. These farmers are usually poor and have no choice but to work the land on their own. But if a woman owns more than that, she either rents it out if she has no male relative, or lets her husband or other men work it. She would proudly say to her neighbors: 'my husband doesn't want me to soil my hands in the land so he doesn't let me help him.'"

In Qena, this phenomenon was found to be more pronounced. To begin with, it was a difficult task for the local extension engineers to convince the women and their male relatives to attend the interview meetings. This difficulty is not unique to this study. In fact, as Soumaya Ibrahim admits at the beginning of her report on her study of farmer practices in Assiut governorate:

The first and largest obstacle faced by the team was finding the whereabouts of the female farmers who practice agricultural work. An obvious trend in the village is to [deny] [sic] female agricultural labor as it is considered a big disgrace if they are said to be working in the field.²

A similar interesting observation was noted in the field work conducted for this study in Dandara village, Qena district. All the women interviewed without exception claimed that they did not farm despite knowing substantial information on their lands' situations. Yet,

² Soumaya Ibrahim. *Farmer Practices in Water Management: The case of Awlad Ibrahim Village, Assiut Governorate*. Cairo: MWRI, 2002, p. 2

while driving the small distance (5 kms) to and from this village which straddles Qena city, several women were observed working the land.

This contradiction was explained by Milad Hanna, General Director for Land and Water at Qena Agricultural Directorate: *“I know of many girls from Dandara village who work at poultry shops plucking chickens in Qena city. The men here would rather send their girls out to work outside the village where they cannot be seen than admit to the rest that they are making their women work.”*

4.1.2.2. Irrigation Tasks

Previous studies of female farmers’ participation in water management point out that women claim they do not irrigate since in their understanding, irrigation only involves working the pump, a physically heavy task that only men can perform.³ While this finding was noted in this study, a slight change in women’s perceptions has been observed. Now, **many women** (notably 92 or 51% of the groups) **understand that they do in fact irrigate their lands, even if the pumps are switched on by men helping them.** They acknowledge that irrigation means deciding when the pump should be turned on and off and report that they know when this should take place.

Operating the irrigation pump

Traditional irrigation pumps require preparation stages where the suction hose is let down into the water, water is filled into the pump, diesel carburant is poured into the tank and the crank handle is pulled on. With the exception of a few cases (7 groups – 6%), the female water users said they could not perform this exercise as it requires physical strength.

However, this obstacle does not prevent women from irrigating their lands if they are on their own. *“Turning on the pump is no problem,”* said Faragallah Mohamed Sa’d from El-Qonn village (Sidi Salem district, Kafr El-Sheikh governorate), who many times farms 1 feddan alone when her husband is away praying or performing errands. *“I wade into the water, connect the hose, fill the tank with diesel and then wait for any passer-by to turn it on for me. Turning it off is no problem, because it doesn’t require strength.”* This response was confirmed by the majority of the groups (98 – 83%).

In fact, many women, such as Do’aa Elewa Ali, a tenant on 0.5 feddans in Kafr El-Sohbi village (Shebeen El-Qanater district, Qaliubeya governorate), operate the pump themselves. *“Sometimes my son is not available to turn on the pump for me, and hours go by before any man passes by,”* she said. *“Many times, that happens when I’ve just put fertilizer. Do I leave my soil to burn from the chemicals? Of course not. I just keep pulling and pulling at the crank handle until the engine starts.”*

An interesting response, given by several female water users like Fatma Mohamed Idris from Meet El-Amel village (Aga district, Daqahliya governorate), who owns and 1.5 feddans is that (as for rice planting) women cannot wade into the water to connect the pump hose. Upon further probing, however, Fatma admitted that if weeds or garbage block the hose as she is irrigating, then she wades into the *mesqa* to clean them: *“I can’t leave my pump to break down, can I?”* she said.

³ Hanan Radwan. *Female Farmers in Egypt: Their Water Management Interests and Coping Mechanisms.* The Water Boards-IIIIMP and the Egyptian NGO Support Center. Cairo: December 2007, pp. 32-7.

“Women now have become like men. They’re even stronger than us,” said Abdel Moneim Mohamed, who farms 40 qirats as a tenant in El-Shaheed Fekry village (Berket El-Sab’ district, Menufiya governorate).

Abdel Moneim adds that new imported pumps that are easier to switch on are spreading fast in the Delta region, thus simplifying the task of operation for women.

Other activities – such as IIP – have also eased the physical burden of irrigation on women. Since water flow from the *mesqas* to the fields is regulated by easy-to-handle gate openings or by hydrants, the traditional cumbersome irrigation pumps are no longer required. “IIP has made a huge difference to me in irrigation,” said Fayza Sa’d Mohamed, a tenant on 2.5 feddans in El-Qonn village (Sidi Salem district, Kafr El-Sheikh governorate). “All I do is lift the gate at the opening of my field to let the water in. In fact, with this new system, I’m faced with water flowing in too quickly for me to manage. If I don’t prop up the sides of my marwa carefully, the water would flood my land. Many times my neighbors have complained because I couldn’t regulate the water flow in time before it reached their lands.”

However, with the exception of Kafr El-Sheikh (and to a certain extent Bisintway in Beheira), farmers in all of the areas visited where IIP facilities have been installed complained of malfunction of the system and of continuous water shortages. This has inevitably driven many of them to return to using their traditional irrigation pumps and irrigate directly from the *mesqa* or secondary canal, a practice that is illegal but resorted to frequently. Still others resort to digging and irrigating from wells.

Night Irrigation

Of the female water users interviewed, a sizeable proportion (40 – 34%) reported that frequent water shortages oblige them to irrigate at night or dawn. While this is a nuisance for most of them, it is not – as is commonly believed – a dangerous or shameful activity for women because the latter always take their sons or other male relatives with them to the field. “Most of us have no choice but to irrigate at night,” said Zeinab Abdel Sattar, a widow from Sandanhour village (Banha district, Qaliubeya governorate) who farms 0.5 feddans together with her teenage son. “I take my son with me when I go, and if he’s not available, I take one of my nephews or even the son of my neighbor. No-one says anything to me. They all know I am out tending to my daily bread; and besides, as long as I take one of my male relatives with me, I am free of any gossip.”

Most of the female water users said that night irrigation is an option that all farmers (male and female) resort to during times of water shortage. In areas where farmers hire pumps, some women reported to being obliged to irrigate at night by the time their turn comes. This, however, is a condition that happens to any farmer who has a late turn and this is not influenced by gender factors.

Other tasks

Almost all female groups who said that they irrigate also reported that they channel water manually through furrows in the field. “Any woman who irrigates herself has to channel water in the land, otherwise the seeds would drown or not get water. It’s a logical thing. Irrigation is not just a matter of letting water into the field; you also have to channel it,” said Sa’deya Hassan Atta from El-Safayna village (Toukh district, Qaliubeya governorate), who helps her father-in-law farm 33 qirats.

Another task that most women perform is manual weeding in the *marwa* and *mesqa*. This task is confined to picking and tearing of small thin weeds within reach from the banks. Women mostly pick and clean weeds from small *marwas* and usually seek the help of their male relatives or neighbors (in the case of widows) for this task. Heavier work is performed by maintenance machines.

4.1.3 Conclusion

Women perform most of the tasks involved in farming, including heavy manual work - such as land preparation, planting of seedlings and bundling of crops - that has traditionally been conceived to be performed only by men. Moreover, contrary to common perceptions, women do plant rice seedlings themselves with no shame. In fact, ***more and more women are participating in farming owing to the preference by men – driven by hard economic conditions – to seek jobs in Egypt and abroad.*** Still, in some areas, farming by women is perceived by the inhabitants to be a shameful activity performed by those whose husbands cannot afford to relieve them of this job.

These days, more and more women are coming to realize that they do irrigate, even if they cannot physically turn on the pump. For one thing, they understand that irrigation entails knowing and deciding when the pump should be turned on and off, and for another, they always seek the assistance of their field neighbors and passers-by to operate the pumps for them when they are alone in the land.

In areas where collective pumping stations are installed and where they function properly, women have been relieved of the physical burden of irrigation as the new systems require no more than lifting small gates at the field openings to let in the water.

However, in most areas, all groups (male and female) reported to resorting to night irrigation during times of water shortage. This is an alternative that all (irrespective of gender status) are obliged to seek to obtain water and is not dependent on gender. Moreover, since night irrigation is becoming more common in light of frequent water shortages, female farmers have become accustomed to it and as long as they take along male relatives, they are free of danger or criticism by the community.

Most female groups also reported to channeling water in the fields and cleaning and picking weeds from *marwas*.

4.2 Access to Resources

4.2.1 A Noteworthy Example

Before Fawzeyya lost her husband five years ago, she used to farm their 11 qirats with him everyday. Today, with her six girls all married and her only son working as a day laborer, 55-year-old Fawzeyya has learned to cope on her own.

Yet, she is not bitter. Although the high prices of inputs add to her financial burdens, she has access to the resources that help her to manage her land on her own. She can freely visit the cooperative to purchase fertilizer; she knows all the merchants in her area to whom she can sell her harvest; and like her neighbors, she hires pumps to irrigate her wheat crop.

Hiring pumps is not a problem for her. As she says: *“If a pump is busy or broken down, I look for other owners. People are kind and help me because they know I’m on my own. Once I had to irrigate at night and took my son. My neighbor at the field took pity on me; he told me to go home and he stayed behind to irrigate my land.*

“My only problem with the land is that it is no longer profitable,” she continues. “Prices are too high and my returns are low. The sorghum I grow is hardly enough to feed our buffaloes. So my son has to work to pay for other expenses.”

Fawzeyya Abdel Hamid Farahat, Ibnahs Village, Qowesna district, Menufiya governorate.

4.2.2 Perceptions of the Water Users

Access to and control over water management resources have a significant bearing on the degree of authority that a water user can wield in decision making. The findings of the study indicate that women enjoy more or less equal access as men to water management resources, and in the cases when they do not have such control, the underlying reason relates more to economic factors and lack of proper knowledge than to gender inequality.

4.2.2.1 Access to Agricultural Resources

In the domain of agriculture, women were found to enjoy equal access as men to inputs, services, information and marketing.

Agricultural Inputs

After the liberalization of agriculture, farmers are no longer obliged to purchase their inputs from the agricultural cooperative. However, it was observed that the majority of the water users (136 male and female groups – 76%) obtain their seedlings and fertilizers from the cooperatives because they are cheaper and of better quality than those sold by local merchants.

Agricultural Cooperative

All of the female landowners without exception – even those in Qena – mentioned that they visit the agricultural cooperative to obtain the inputs themselves, a necessary step as they have to sign receipt as landowners. This means that female landowners who claim that they are not involved in farming matters or (in the case of Qena) do not leave the house for such matters nevertheless visit the cooperatives in their villages. This also includes widows and other women who farm on their own.

In fact, a number of female water users (23 – 13%) reported that they visit the cooperative and/or local extension center to obtain information on planting methods, pest control, and other issues that they encounter while working the land.

Day Laborers

Women can also hire day laborers themselves. Increasing poverty and unemployment, coupled with low profits gained from small landholdings, have given rise to a growing number of day laborers available in most villages. Indeed, as recent studies have shown,

many farmers (of which a sizeable number are women) in the Delta region who own small plots also work as day laborers to make ends meet.⁴

“We [women] have no problems hiring workers,” said Fawzeyya Abdel Hamid Farahat, a widow from Ibnahs village (Qowesna district, Menufiya governorate) who farms 11 qirats with her son. *“We either ask neighbors [in the land] who hire them or else we ask others in the village. The problem with workers is not that they are scarce; they are expensive for me. Nowadays, the average daily wage of a worker costs me LE 25 per day. How can I afford them when my land is only a few qirats and brings me little profit?”*

This response has been reiterated by most water users (male and female). This has two implications: a) male landowners who own small plots prefer to let their wives or daughters assist them in farming over the cost of hiring day laborers; and b) women who farm on their own and who do not hire day laborers do not enjoy access to this resource because of their economic, and not their gender situation.

Marketing

With respect to marketing of crops, the role of the agricultural cooperative has diminished if not disappeared, and farmers are now left “free” to select whatever merchants they wish to deal with. In almost all areas visited, the majority of the men and a sizeable number of the women were disgruntled with this situation, complaining of unfair prices. However, what is of concern to the study is that this situation has also obliged female farmers to seek and select from this resource. Of all the female water users, none has expressed any difficulty in locating or dealing with a local merchant.

“We [women] go to the merchants and negotiate the prices with them freely without anyone criticizing us,” said Ghalya Sa’d Soleiman, a widow from El-Qonn village (Sidi Salem district, Kafr El-Sheikh governorate) who owns and farms 2 feddans. *“We know them all because they live in the same village as we do, so it’s no shame to talk to them.”* In the case of Qena where the principal crop is sugar cane, women sign yearly contracts with nearby sugar factories for purchase of their harvest.

Moreover, it was observed that women in all areas (with the exception of Qena) are intensely involved in the marketing of rice, wheat and vegetables. These crops are marketed by one or more of the following means: a) Sale to local merchants; b) Sale to neighbors and extended family members; and c) Sale at weekly markets (by the female farmers themselves).

Given the small size of most landholdings, the bulk of the harvest is set aside for household consumption; since what remains behind is usually of small quantities, it is the women who take charge of selling it through one or more of the above means. In fact, more than half of the female groups (62 – 53%) reported that they sell their crops themselves at the weekly market.

“Wherever you find vegetables grown, you can be certain that women are heavily involved in harvesting and marketing,” said Amal Fathy Tantawi, Environmental Specialist at the Menufiya Agricultural Extension Directorate. *“You can’t beat a woman when she negotiates with a merchant or buyer over her vegetables. She knows what vegetables bring the best prices.”*

⁴ Ibid, p. 51.

The situation is different in Qena where sugar cane is the principal crop. In this case, farmers (including female landowners) sign yearly contracts with the sugar factories for sale of the harvest. In most areas, the sugar cane is transported to the factories via rail lines that run along the farmers' fields. However, in some areas these lines have broken down or been stolen, obliging farmers to transport their crops at their own expenses. Obviously, this represents an economic burden on them, especially if they are women who farm independently and own small plots of land.

4.2.2.2 Access to Water Management Resources

Water management resources are accessible to both women and men, but it was found that women are sometimes in a disadvantaged position owing to their lack of proper knowledge of water management information.

Excess Water

During times of water shortage farmers resort to three main alternatives to obtain excess water: Drainage water; Community or private wells; and Pumps hired to irrigate directly from the *mesqa*/ secondary canal.

With respect to the first option, all farmers have easy access through their field drains. The same is true of the other two options although they are costly, especially for tenants and small landowners. This reason, however, relates to economic factors and no gender preferences or bias were observed. The pumps are hired on a first-come-first-served basis. When community wells are dug, all farmers contribute to the investment cost and pay for using them by the hour. Similarly, if a farmer (male or female) does not possess a pump, then s/he hires it in the same way to obtain excess water from the secondary canal/drain.

Maintenance

Maintenance of *mesqas* is performed by the Executive Authority for Land Improvement Projects (EALIP) at the MALR at a fee that is charged to farmers and paid for when they purchase fertilizers and other inputs from the agricultural cooperatives. This means that farmers have to contribute to obtain this service, a fact that is not always easily achieved since it requires consensus and willingness to pay.

However, in the cases when farmers do decide to contribute towards maintenance of a *mesqa*/*marwa*, then all of them pitch in, including the women. *"If our [male] neighbors [at the field] want us to pay for works on the mesqa, we give them the money without hesitation because we trust that they will do what is best for us. If we don't have the money, they wait for us until we are able to come up with it. But I don't know when the machines come or what they do. I just give them the money,"* said Fatma Mohamed Idris from Meet El-Amel village (Aga district, Daqahliya governorate) who owns and farms 1.5 feddans.

The situation is similar in IIP areas, although in these cases as well, most of the female water users paid without knowing what the money was meant for. *"Every six months, Hajj Hamdy [head of the Derqams mesqa WUA, Mehalet Keil village, Abou Homos district, Behaira governorate] sends someone over to my house to collect money. He says it's for the [IIP] pump station but that's all I know. Of course, I give the money to him,"* said Hamdeya Ismail, who owns and farms 6 feddans.

Marwa Improvement

Few of the water users interviewed for the study have heard of or have easy access to this resource. The majority (152 male and female groups – 85%) do not know of this process and even those in areas where improved *marwas* were seen frequently while driving to and from them (notably Meet El-Faramawy village, Meet Ghamr district, Daqahliya governorate), only two of the six women interviewed knew of *marwa* improvement.

Moreover, most of those who knew of this facility claimed it to be costly and – like *mesqa* maintenance – difficult to realize owing to the need for consensus and willingness to pay from several farmers.

In brief, therefore, access to this resource is difficult not only for women but for men as well.

Laser Levelling

In contrast to *marwa* improvement, laser levelling is familiar to most of the water users and a sizeable number of them (77 male and female groups – 43%) reported having used it.

However, of the female groups, none of the widows or women who farmed their lands on their own (with husbands working abroad) said that they used this facility, the main reason being the high cost. As Sobheya Wesal from Ibnahs Village (Qowesna district, Menufiya governorate), whose husband is sick and cannot help her farm the 0.5 feddans which she has rented, explains: “*We can barely afford to make ends meet. I have my husband to take care of and three children to feed. I can’t afford this laser levelling. I’ve heard it’s good and saves water, but it’s too expensive for me.*”

Another reason is stated by Hassan Ahmed from Dandara village (Qena district, Qena governorate) who owns 2 feddans: “*Laser levelling is not worth the money if it is done on small plots, which is the case in our area and in most areas in Egypt. To best make use of this service, you either have to own 5 feddans or more or gather a group of landowners with small plots who would be willing to jointly pay for it.*”

4.2.3 Conclusion

With respect to agricultural resources, women were found to have equal access to men. As landowners, they obtain their inputs from the agricultural cooperatives and if they have information to seek regarding the situation of their lands and crops, they approach this institution or others like the extension department/center with no restrictions. Women also hire day laborers with no difficulty, and in the Delta region, they are involved in marketing of crops such as rice, wheat and vegetables which they sell to merchants, neighbors or buyers at the weekly market.

With respect to water management resources, however, men were found to have easier access and control. This was particularly evident with regards to maintenance services which are decided upon by the men and of which women lack proper information (i.e. how and when the service is being performed and what the collected fees are for), as well as with other water management services like *marwa* improvement and laser levelling which are too costly for women who farm independently.

However, excess water as a resource is accessible to all farmers through drains or community options such as wells and hiring of pumps. Yet again, this represents a financial burden on small landowners (male and female).

4.3 Knowledge of Water Management Issues

4.3.1 A Noteworthy Example

When Amal was a little girl, she used to spend many mornings planting onions with her grandfather, who taught her a lot about farming. Coming from a village in Upper Egypt, she ceased to go to the fields after she came of age and has now forgotten most things on farming.

But Amal is not ignorant of the water management issues in her area. *“Once I heard two of our field neighbors arguing loudly with one another,”* she recalls. *“Our house is at the field so I could hear everything they were saying. One of them [whose land was downstream at the mesqa] accused the other [whose land was upstream] of blocking the water flow by not cleaning the weeds at the sides of the mesqa bordering his field. They argued for a long time until a third person came in and made the first farmer promise to remove the weeds.”*

Amal Hussein, Danfiq village, Nagada district, Qena governorate.

4.3.2 Perceptions of the Water Users

It is difficult, if not impossible for a water user to assume an active role in water management participation and decision making if s/he does not have adequate knowledge of its issues and basic facts. This knowledge, as the findings indicate, is weak and in many cases non-existent for the female water users, especially when compared to that of the men.

In fact, the findings highlight this parameter as the one in which gender discrepancies were most acute.

4.3.2.1 Crop Related Issues

When it comes to daily tasks and issues related to the land, most of the female water users (amongst them those who own land but do not farm) possess adequate knowledge. For one thing, the majority (107 – 91%) is familiar with facts such as the quantity of fertilizer and the number of days and hours per day required to irrigate each type of crop.

“I know when my land is thirsty and when it has had enough water,” said Sa’deya Hassan Atta from El-Safayna village (Toukh district, Qaliubeya governorate), who helps her father-in-law farm 33 qirats. *“I also know that I need to let the land rest for a few days after I harvest my maize and before I prepare it for wheat. The land is like us [women] who need to give ourselves time after delivery before getting pregnant again.”*

Moreover, all of the female groups who participate in farming (whether they are landowners or farmers’ relatives) are familiar with the local merchants to which they sell their crop yields. This includes female farmers in Qena who sell their sugar cane harvest to representatives of the local sugar factories.

The fact that women know of the local merchants is not surprising since the latter are from the same villages; and although merchants from other areas may sometimes be involved, *“we usually settle for those who come from our village because they are our neighbors and countrymen. Even if an outsider offers us a better price, we are morally obligated to sell to our own people,”* said Hanan Abdallah from Sandanhour village (Banha district, Qaliubeya governorate), who helps her husband in farming 10 qirats in his name and 6 qirats as tenants.

Indeed, when it comes to immediate issues related to their daily bread, women do not hesitate to seek information. *“If I notice that something is wrong with my crops or a disease has struck, I immediately go to the cooperative or extension office,”* said Fatma Shehata from Ezbet El-Sa’i village (Beila district, Kafr El-Sheikh governorate), who owns and farms 5 feddans. *“If my neighbors can’t help me I don’t wait. I go to the specialists and when they tell me of a pesticide, I immediately buy it from the cooperative or from a local merchant. Also, when I see the extension engineer close to my land, I call him over for advice.”*

This response has been corroborated by the majority of the female water users and expressed in an incident that happened to Howaida Abdallah from El-Safayna village (Toukh district, Qaliubeya governorate), who helps her husband farm 6 feddans: *“I don’t farm much. My husband doesn’t let me. I don’t know if that is because he wants to relieve me of the work or because he doesn’t trust me. But one day, we went to the field to find all our palm trees struck with a disease. I know the women who work at the village extension center so I went there and told them about the disease. They told me of a pesticide which I bought from a local merchant. I wish you could taste our dates now. They’re more delicious than those that you get in the market.”*

Interestingly, most of the extension engineers interviewed for the study (with the exception of those in Qena) reported that widows and other women who farm on their own are their most frequent visitors. As Mahmoud Mohamed El-Tanbouly, Head of Aga Extension District, Daqahliya governorate explained: *“A woman who farms on her own feels more vulnerable than a man in the same situation. She is always afraid that if something goes wrong with her crops, then she would not be able to feed her children or other farmers and neighbors would mock at her. So she puts in more effort to gather information on what’s best for her crops. Also, a man in her situation can always leave the land and go seek a daily job. But if a woman’s crop fails, she has no other way to make a living.”*

4.3.2.2 Knowledge of Water Management Facts

As seen above, women were found to be knowledgeable of facts and issues concerning their daily farming tasks and field management. These are issues that are related to the *individual* situation of each woman’s crops. However, when such issues become communal and transcend their individual day-to-day situation, the knowledge and interest of women was found to recede markedly, especially when compared to that of men.

Cropping Information

For example, women do not participate in any collective decisions on the crops to be grown each season – an exercise that rarely happens anyway (see *Participation in Water Management Decisions*). Thus, many of them (100 – 85%) do not know what their neighbors will plant each season unless they ask them.

While this observation was also noted amongst the male groups, their knowledge was not as superficial as that of the women, since the former have greater and easier access to information in general. In the words of Abdel Ati El-Zayat, a tenant on 3 feddans from Ezbet El Sa'i village (Beila district, Kafr El-Sheikh governorate): *“After agriculture has been liberalized, it’s every man for himself now. Each one of us is free to grow what he wants without consulting anyone. We are not limited to a crop rotation like the situation earlier. But because we are related through marriage and see each other frequently at the field, the café or the mosque, we know what each of us intends to grow by chatting informally with one another.”*

Yet, it is important to note that while women’s role in collective decision making is weak, the *indirect* influence that they wield over their husbands and male relatives with respect to cropping decisions each season was found to be substantial (see *Participation in Water Management Decision Making*).

Water Management Problems

Apparently, the social mobility and freedom of interaction enjoyed by men allows them to learn more than the cropping plans of their neighbors. More than half of the male water users interviewed (32 – 53%) knew the names of their *mesqas* and secondary canals while of all the female groups, only two (in Beheira) were familiar with such information.

Information gaps such as this manifest themselves during discussions about the water management problems in the command area. When the male water users were asked to describe their water management situations and problems, most of them provided detailed articulate information; in contrast, the majority of the female water users were unable to provide explanations beyond the mere existence of water shortages.

The following discussion held with a group of male and female water users from Meet El-Faramawy village (Meet Ghamr district, Daqahliya governorate) is an apt illustration:

Interview with male groups:

Interviewer: *What is the main problem in your area?*

First Male Respondent: *We have no water throughout the year. Our mesqas are completely dry.*

Interviewer: *What do you think is the reason for this?*

Second Male Respondent: *The problem is at Meet El-Faramawy [the secondary] canal. It is more than 5 kms long and runs through our village and another one before us. We are all at the tail end of the canal. If you drive along its end you will see that it borders a crowded residential area where everyone dumps their garbage, blocking it until it becomes completely dry at the end [an observation that was confirmed by the interviewer].*

Third Male Respondent: *You’ve forgotten to mention another serious problem. All our mesqas have been constructed below the level of the secondary canal. We use pumps to lift up the water to our fields, but when the canal is dry, these pumps are of no use.*

Interview with female groups:

Interviewer: *What is the main problem in your area?*

First female respondent: *There's no water. Our lands are dry. We're losing a lot because of this. Our crops are dying.*

Interviewer: *What do you think is the reason for this?*

[Long silence. The female groups look at one another]

Second female respondent: *We don't really know. They say all the mesqas are dry.*

Interviewer: *But why didn't you bother to find out?*

Third female respondent: *That's the responsibility of our husbands, not us.*

Interviewer: *But doesn't this problem affect your land, your daily bread?*

Third female respondent: *It does, but what can we [women] do about it if our husbands can't do anything?*

Interviewer [question addressed to a widow who farms on her own]

What about you? Aren't you concerned about your land?

Aren't you interested to find out what's causing the problem of water shortage?

Widow: *I have enough troubles on my own trying to farm the land. All of us have dug wells so I irrigate from that water. I do like the rest. Do you expect me on my own to go to an official and ask him what the problem is? What are the men doing then?*

Then again, in many cases, even the male water users were not found to be completely knowledgeable about the issues and underlying reasons for their water management problems. In other words, although men's knowledge was found to be deeper than that of women, it was not complete or even accurate. When asked, the officials interviewed for the study cited the following reasons:

1. Infrequent contact and communication between water users and the concerned officials;
2. The existence of small landholdings means that the command areas of certain *mesqas* (some of which may reach more than 5 kms in length) may include more than 50 farmers. Information sharing between such large numbers becomes difficult than between smaller groups;
3. Water users' apathy and indifference to address their problems by finding out the causes means that they only deal with the *effects* by seeking other alternatives (eg. digging wells)

A telling example of the lack of proper knowledge of male farmers and the infrequent communication between them and local officials is illustrated by the following discussion which took place at El-Safayna village (Toukh district, Qaliubeya governorate):

- Interviewer: *Do you have a drainage problem in your area?*
- First Male respondent: *Yes we do, and it's a serious problem. All our lands are clogged with water leaking from the drains.*
- Interviewer: *What do you think is the reason behind this problem?*
- Second Male Respondent: *Our field drains have not been dug low enough so they can't absorb the water reaching them.*
- Local Official: *This is not true. The real reason is that your field drains have been constructed with a capacity to absorb water from standard crops and orchards, not from rice. Now all of you are growing rice, even though Qaliubeya is not supposed to grow rice. So it's logical that with all this extra water your field drains are bursting from the excess pressure.*

If communication between male water users and local officials is insufficient, that between the latter and female water users is negligible if non-existent. With the exception of male extension engineers and female rural development specialists working at the local extension centers, women do not know and have had no contact with local officials, even those who are present within their command areas. This observation is illustrated by the case of Fatma Ibrahim Hassan from El-Safayna village (Toukh district, Qaliubeya governorate) - the same area in which the above discussion took place - who helps her husband farm 1 feddan. When asked of the reason for water shortage Fatma gave the following reply: *"I don't know. All I know is that there's a man working for the government who sits at the head of the canal [i.e. the bahari]. When he opens the gate, we find water in the canal. Otherwise, there's no water. I don't know his name. I've never seen him."*

Knowledge of WUA

None of the female water users and very few of the men (5 – 8%) living in areas where such associations do not exist had any knowledge of what is a WUA. However, in the areas where WUAs had been established, the majority of the men knew at least of their existence, while very few of the women had any knowledge about them.

For the most part, the only information that the female water users knew was the existence and name of the pump operator, who discharges water to their fields according to their allotted turns, and to whom they are required to pay the regular fees for operation and maintenance of the pumping station. Apart from that, the female groups had scant or no knowledge of the functions of the WUA, its members and its activities.

This observation is summarized by the comment of Sa'deya Abdel Karim from Mehalet Keil village (Abou Homos district, Beheira governorate), who owns and farms 2 feddans in an area where IIP facilities have been established more than 5 years ago: *"I don't know of any association. I only know the man [the pump operator] to whom I go whenever I want to irrigate. He also comes to collect money from me every year. I don't know what that is for. Maybe it's for his salary."*

The degree of knowledge of male farmers may be higher, yet they do not consider the WUA as an institution from which they can obtain information. All of the male water users know the WUA members by name or person even though some did not have full informa-

tion on the WUA's existence or activities. Yet, the WUA members are consulted as fellow farmers and not as members of a water management association.

The only exception to this observation is when the male water users are not satisfied with the maintenance services for which they are required to pay the fees. As Rasha Shawki from El-Qonn village (Sidi Salem district, Kafr El-Sheikh governorate), who helps her husband farm 3.5 feddans explained: *“At one time the [IIP] pumping station broke down and the men were angry. They wanted to know where their maintenance money went. So the Sheikh El-Mesqa held a meeting for all the landowners in a house close to ours. I heard them talking. The Sheikh El-Mesqa was reviewing the final accounts with the men.”*

4.3.2.3 Sources of Information

The main reason for the discrepancy in the level of knowledge of female and male water users is that the sources of information for the former are fewer and less accurate than for the latter.

Generally, women obtain their information from secondary sources such as male relatives, neighbors and other villagers. Only a few of the female water users (20 – 17%) reported that they purposely approach extension engineers or officials at the agricultural cooperative, except when they meet the former by chance in the field or when they visit the cooperative to purchase agricultural inputs.

A rather unconventional but very common source of information for women is chance observation. If a meeting happens to take place while a woman is serving tea or food to farmers in the field, or in her house or that of a neighbor's, then the information reaches her in a *de facto* manner. Also, if a water management activity is implemented close to her home/field, then she will ask about it and thus obtain information.

An apt example is that of Foz Abdel Hadi, a widow from Meet El-Amel village (Aga district, Daqahliya governorate) who has rented out her 2 feddans. *“I know very little about agriculture and irrigation because I've rented out my land and have nothing to do with it. But a few months ago, I saw machines cleaning the mesqa close to my land. They were doing a very bad job, dumping the soil on the edges of the mesqa in a way that made it easy for it to fall back into it the day after. The only thing they are good at is charging us money for this shoddy work when we get our fertilizer from the cooperative.”*

Interestingly, women were found to be keen and highly motivated to learn new information and do not hesitate to ask others on matters related to improving the *productivity* of their lands. In other words, when it comes to the day-to-day farming tasks, women learn by practice and are always eager to seek information. *“Before I got married, I didn't know much about farming,”* said Halima El-Sherif from El-Safayna village (Toukh district, Qaliubeya governorate), who farms 6 qirats in her husband's name. *“But when I started helping my husband in the land, I found myself learning from him. Now he has left farming and works as laborer in masonry. When he's away, I'm responsible for the land. If there's something I need to know when he's not around, I ask my neighbors or my father-in-law. I watch my neighbors and do as they do.”*

Another female farmer - Sobheya Wesal, a tenant on 0.5 feddans from Ibnahs village (Qowesna district, Menufiya governorate) - sums up this phenomenon: *“I've been born a farmer. All of us are born farmers. Even if we didn't work the land when we were young, we*

know a lot about it. Isn't it our livelihood? Now my husband is sick and can't farm with me. But I ask my brother-in-law or my neighbors at the field. I've learned to grow lettuce with cotton. Once, a passer-by noticed that my land was thirsty. So I asked him to turn the pump on for me and I irrigated the land. I have three sons. They come to the field with me and I teach them what I have learned, just as my husband taught me."

The same was found to be true even in more conservative areas like Qena where women are less involved in farming but still possess adequate knowledge on farming techniques and issues. The case of Amal Hussein above (see *A Noteworthy Example*) is one of several examples noticed amongst the female water users in Qena.

Still, the sources of information for women remain inferior to those of men, who obtain their knowledge from direct consultation with each other and from local officials and other primary sources.

Another factor that enables men to learn of broader issues is that of education. As one farmer in Dalgamon village (Kafr El-Zayat district, Gharbiya) put it: "*We [men] read newspapers. We watch the news and educational programs on television. Then we discuss these issues with one another at the café, in the field or during social gatherings.*"

The media is also a preferred mode of communication for women. In fact, many of the female respondents (as well as the men) expressed regret that the agricultural education / awareness program entitled Serr El-Ard (Secret of the Land) is no longer being aired on television.⁵ "*It was a very useful program, especially for us [women],*" said Shahira Mohamed Soliman from El-Qonn village (Sidi Salem district, Kafr El-Sheikh governorate). "*It taught us a lot of things about farming that we had never heard of before, like how much fertilizer to add for which crop and what to do with worms and diseases. We used to wait for it every Friday. It's a pity that this program has stopped.*"

4.3.2.4 Willingness to seek information

However, lack of proper education is not the principal factor that prevents women from seeking information. Another more fundamental aspect is their lack of motivation to learn of broad water management issues. As mentioned before, only a small minority of the female groups knows the reasons behind the water shortage problems in their areas, and when asked why, most of them responded that it was not their responsibility to find out because they consider water management to be a male domain.

Even when the women were further probed with questions such as "isn't this information related to your daily bread?" most of them responded with indifference.

"I am very surprised that the women are not interested in finding out more about their water situation, and that they are so passive during this interview," remarked Hussein Abdel Meguid, head of El-Mehalla El-Kobra Extension Department, Gharbiya governorate. "*You should see these same women in one of the meetings that we organize on avian flu or reproductive health. You can't keep them quiet. They all have something to say and they all want to know everything.*"

⁵ This program was funded by USAID for a fixed duration and has ended more than five years go.

Two main reasons were deciphered from the interview findings that explain women's lack of motivation to seek information on their water management situations:

- Although women participate in day-to-day irrigation and on-farm water management, broader issues are considered to be the responsibility of men;
- Water management issues usually affect more than one water user and require collective decision making, a process that rural women shy away from;

However, when it comes to issues that affect the state of the household and its members, women in most cases assume a direct role since this is regarded by rural society to lie within their domain of responsibility. In the words of Basima Ateya, a tenant on 9 qirats from Kafr El-Sohbi village (Shebeen El-Qanater district, Qaliubeya governorate): *“Anything related to the land and the canal is the responsibility of the men. Anything related to the children and house is our responsibility. Yes, of course we help our husbands in farming but in the end it's still their responsibility.”*

4.3.3 Conclusion

As far as crop related issues and matters related to day-to-day farming are concerned, women's knowledge was observed to be substantial and their motivation to seek additional information considerable.

However, when asked about water management related issues such as the reasons for water scarcity, the process, procedures and fees for maintenance, and the WUA, a significant knowledge gap was observed between the female and male groups. Although in many cases even the men were not fully aware of the intricacies of their water management situations, their degree of knowledge was still higher than that of the women.

In fact, the gender gap observed under this parameter is the most visible and acute of all findings.

The main reasons for this knowledge gap are that a) women usually obtain their information from secondary sources, hearsay and chance observation; and that b) they are less motivated than men to gain in-depth information on water management issues, a domain that is considered a male responsibility.

4.4 Participation in Water Management Decisions

4.4.1 A Noteworthy Example

“My husband and I don't own any land,” said Fatma, a middle-aged woman with three children. *“We are tenants on 9 qirats. We can barely make ends meet. One day, my neighbors told me of a small factory for pickles that was going to open in the next village. I thought ‘why not grow carrots and sell them to that factory?’ At first my husband was not convinced. But now he thanks me for that suggestion. It doesn't bring us much but our situation is better than before.”*

Fatma Saqr, Batanoun village, Shebin El-Kom district, Menufiya governorate.

4.4.2 Perceptions of the Water Users

The findings under this parameter are in many ways an extension of those observed under the previous one. Given women's relatively low level of knowledge on water management issues, their role in formal decision making and decision taking was found to be weak and passive, especially when compared to that of the men. However, their *informal* influence over their male relatives with respect to crop selection decisions proved to be more intense.

In other words, the role of the female farmers in the decision *making* process was found to be more pronounced than that in decision *taking*.

4.4.2.1 Crop Selection: Field Level

At the individual field level, the degree of leverage that women possess over decisions is profound and in most areas publicly acknowledged by all groups (male and female).

All of the female groups who farm on their own (i.e. widows or women whose husbands work as employees in Egypt or abroad) reported to be the prime decision makers and the decision takers on the types of crops to cultivate, even if they are assisted by grown sons or relatives. Unless the water situation in their areas compels them to plant certain types of crops (see below), these women wield absolute control over crop planting decisions.

As far as farmers' wives/relatives are concerned, the female groups in all the study areas (including Qena) reported that their role centers on advising the men on the types of crops to grow each season, especially when these crops are vegetables or rice and wheat used for home consumption. Thus, they wield substantial control over the decision making process of crop selection.

"My husband doesn't let me use the axe and farm with him, even though I know a lot of farming," said Howaida Abdallah from El-Safayna village (Toukh district, Qaliubeya governorate), who helps her husband farm 6 feddans. *"But he always turns to me for advice on what vegetables to grow. Yesterday as he was preparing the land, I had him reserve the sides to grow rocket, dill and parsley."*

This fact was observed in all the Delta areas visited. In fact, as one female water user (Yousreya Youssef from Sandanhour village, Banha district, Qaliubeya, who helps her husband farm 0.5 feddans) mentioned, most families cook *mahshi* (stuffed vegetables) in abundance on Thursdays; hence they are the ones to decide the type of vegetables to plant for these weekly meals.

"Wherever you find vegetables being grown, you can be sure that women play a big role in decisions," said Manal Fathy Tantawi, Environmental specialist at the Menufiya Extension Directorate. *"They are the ones to decide what to grow, where to market the crops and at what price. Women also control household expenses. Men give them the money and they decide where it will go."*

All the water users (male and female) who grow vegetables acknowledged the profitability of these crops. In fact, most of them – especially the men and particularly in Menufiya – were strongly reluctant to switch to other crops that use less water, given the frequent water shortages in their areas. In the words of one of them, *"the prices of vegetables have never gone down and can only go up."*

In Qena, however, the influence of women over men in crop planting is not recognized as openly as by those in the Delta, but it exists nonetheless. All of the female groups stressed that household income is the responsibility of men and if it is negatively affected due to a bad crop, then it is the men's duty to make up for it. Yet, all of them also added that they ask their husbands to grow okra, *molokheya* and other vegetables that are staples in Upper Egypt and the men always oblige. Nevertheless, women in Upper Egypt exercise their decision making power with caution, because as Fawzeya Bastawy, a farmer's wife in Dandara village (Qena district, Qena governorate) explained: "*If we advise our husbands to grow a certain crop and it doesn't bring them profits, they will blame us for that and make our lives miserable.*"

In general, however, women are seen to participate more and more intensely in crop related decisions, especially in view of the fact that crop yields from small landholdings are mostly used for household consumption. As one male farmer – Sabry Ali from Meet El-Faramawy village (Meet Ghamr district, Daqahliya governorate), who owns and farms 5 qirats – admits: "*It is the women who advise us on what type of rice to grow. Even though type Giza 101 produces more yield, they tell us to plant the baladi rice because it tastes better. Now the price of the baladi rice is higher because housewives find it easier to cook and prefer it over the others.*"

This observation was found to be even more applicable to wheat. Since almost all households reserve a portion of the harvest for baking bread, women wield considerable decision making power over the types of wheat to plant. In all the Delta areas visited, the groups (male and female) mentioned that a certain type of wheat was unsuccessful as the bread produced from it was darker and tasted unfamiliar; hence farmers switched to the older types of wheat and abandoned the new seeds.

In some cases, women were found to exercise decision taking power over the utilization of the crop yields. For example, the low selling price of sorghum has prompted some women in the village of Batanon (Shebin El-Kom district, Menufiya governorate) to raise poultry and even buy cattle. The poultry and livestock were fed the sorghum and the resulting income from the use and sale of the animals and birds encouraged other women to follow suit.

4.4.2.2 Crop Selection: Command Area Level

As seen above, the degree of control of the female farmer over decisions with respect to crop selection was found to be intense *within the confines of her own field* or that of her husband/male relative. However, when decisions are made and taken on the larger level of the *mesqa* command area, that control was found to recede markedly.

It should be noted at the beginning that collective decision making as a whole on crop selection has declined if not disappeared in most areas, especially after the liberalization of agriculture and the abolishment of crop rotation schedules.

Only in rare cases did the male water users confirm to gathering together for joint decision making on the types of crops to cultivate. One such case was observed in Dandara village (Qena district, Qena governorate), where all farmers at the *mesqa* command area have to agree to grow sorghum collectively otherwise birds would consume all the harvest if only one or a few plants this crop. Another case was also observed in Qena governorate (Danfiq village, Nagada district) where all farmers at the command area collectively decided NOT

to grow string beans after a CARE funded project for exportation of this crop ended and the exporters ceased to work in their area.

For all intents and purposes, however, collective decisions on crop selection are rare if non-existent. To be sure, farmers (especially men) do exchange information on the types of crops to grow each season; but there are no enforcement decisions or restrictions imposed by them on one another. As Fayza Fou'ad from El-Safayna village (Toukh district, Qalubeya governorate) – who helps her husband farm 3 feddans in his name and as tenants on 0.5 feddans – elucidates: *“All neighboring farmers sit together to drink tea and discuss the situation of the land. Each farmer says what he will grow each season. But if one farmer wants to grow rice, no-one can stop him. The rest of us all have to grow rice otherwise their lands would be flooded with the excess water. The most we can do is to ask that farmer to make sure he puts up [mud] barriers on the sides of his field so that the water doesn't overflow onto our lands. But no matter how well he does it, the first line of our crops that are close to that border is always withered and yellow. But what can we do? We know he's growing rice not to make us angry but because he wants to improve his income and feed his children.”*

In some areas these compromises are reached through negotiation deals. One female respondent in Dalgamon village (Kafr El-Zayat district, Gharbiya governorate) - who does not farm but who has heard of the incident through neighbors - reported that a farmer who was adamant on growing rice agreed to put up mud barriers at the sides of his land on condition that his neighboring farmers would buy fertilizer for him.

As one male farmer remarked, collective decision making is a difficult task given the small landholding size which increases the number of farmers in any given command area: *“Getting together 50 or more farmers to agree on one thing is not easy. It's difficult enough just to get them together in one meeting,”* said Eid Abdel Hamid, who owns and farms 8 qirats and works as the Land Protection Specialist at the Ibnahs Agricultural Cooperative – Qowesna district, Menufiya governorate. *“Besides, now that everyone is free to grow what he wants, it's hard to get them to switch back to the old system. For example, I have my children to feed and I raise buffaloes. I have to grow wheat to feed my children and alfalfa to feed my buffaloes. I can't follow any decisions to grow other crops.”*

In general, therefore, collective decision making in the sense of interactive thinking and commitment to group ideas is rarely practiced in the study areas. Within this picture, women were found to play a marginal role. While their influence is predominant behind the closed doors of their homes, they rarely take part in formal discussions, and like the rest of their neighbors, they abide by crop selection decisions of the dominant few.

A noteworthy example of this observation is the case of Fatma Saqr, a tenant on 8 qirats from Batanon village (Shebin El-Kom district, Menufiya governorate). Fatma wanted to plant wheat but when she saw that her neighbors upstream and downstream had grown alfalfa, she was compelled to grow the same otherwise her seeds would have spoiled from her neighbors' irrigation water. When asked why she did not discuss this situation with them, she replied that they had already planted alfalfa (in September) before she decided to plant wheat (in November).

Cases similar to those of Fatma were observed frequently in the rice growing governorates (Beheira, Kafr El-Sheikh, Daqahliya and Gharbiya) where farmers who had initially de-

cided to plant cotton or maize were compelled to plant rice like their downstream neighbors to prevent their lands from water seepage.

4.4.2.3 Water Management Decisions: On-Farm Level

Without exception, all the female groups who farm independently (i.e. widows, women whose husbands have immigrated or who are employees, or farmers' wives who work the land while their husbands are not present) mentioned that they are the primary decision makers over management of their water resources, and that they implement their decisions with little outside interference. They decide when to irrigate, when to stop irrigation, and when and where to channel water within their fields. They may share such decisions with those who help them (eg. their sons, neighbors or relatives) but in the final analysis, the decision taking authority is their prerogative.

The situation is somewhat different for farmers' wives/relatives. When they are alone at the field (if their relatives are temporarily absent), they assume *de facto* decision authority and can implement these decisions on behalf of their male relatives. If the latter are present, however, they assume full control.

The reason, as explained by Aziza Ahmed from Dalgamon village (Kafr El-Zayat district, Gharbiya governorate), who helps her husband as tenants on 9 qirats, is that "*irrigation is a man's job. We do it when we do it because we have to. Even though we [women] know when and how to irrigate, we leave this job to our men when they are around. Why should we bother ourselves? It's their responsibility.*"

4.4.2.4 Water Management Decisions: Command Area Level

Like the situation with crop selection, collective water management decision making was found to be rare and in many cases non-existent in the study areas. Within that backdrop, the role of women proved to be negligible and passive like that of the majority. Yet, unlike decisions on crop selection, some water management decisions are perforce made by men, especially in IIP areas where water users have to decide on irrigation turns and maintenance fees. In these cases, the decision making role of women was found to be even weaker than that for crop selection.

Water Use

Collective decisions on water use were found to be rare in all the study areas with the exception of those in which IIP is established (see below). For one thing, in all the areas (with the exception of Qena), the water users complained of continuous water scarcity; in such situations, it is every man for himself when water is available.

Another option that water users resort to is the digging of private or community wells. In the case of private wells, decisions are made and taken with full authority by the farmer (male and female) at on-farm level, as described above.

In the case of community wells, two elements are involved. First, the decisions to dig community wells and the division of fees are in all areas decided by the men. Like the issue of maintenance (see below), female water users abide by whatever decisions that are made and pay without any objection, trusting that this alternative is for the welfare of all. Second,

once the wells are installed, decisions on the rental amount are again made by the male water users, but access is obtained on a first-come-first-served basis. In other words, the well owners do not decide on the hiring turns or periods collectively with their customers and no preference is made for one user over the other.

Therefore, given the essential lack of collective decisions on water use between all farmers, the role of women was not an element that could be measured.

Maintenance

As explained above (see *Water Management Tasks – Maintenance*), the maintenance of *mesqas* in non-IIP areas is predicated upon the agreement of all water users within their command areas to pay for the cost. In most cases, this is a difficult task, especially when the command area is large or the number of landholdings is too big to organize the water users for collective decision making. The result, therefore, is that such *mesqas* are rarely or infrequently maintained.

The role of women in this situation is passive. If the male water users do decide to maintain the *mesqa*, then the female water users within the command area abide by their decisions, sometimes without knowing any facts about them. “*When I go to the cooperative, they charge me fees that I have to pay,*” said Na’eema Abdel Baqi from Dalgamon village (Kafr El-Zayat district, Gharbiya governorate), who farms 1 feddan inherited from her late husband. “*When I ask them what this money is for, they tell me it is for cleaning the mesqa. I have no choice but to pay.*” However, when Na’eema and other women in her situation were asked whether they feel compelled against their will to abide by such decisions, almost all of them replied that they trust whatever is agreed upon by the majority and that it is eventually for their own welfare.

Water Use and Maintenance Fees in IIP Areas

In the areas where IIP has been established, the majority of the female water users reported that they were not consulted on their turns in the irrigation cycle nor of the maintenance fees. The response of Sa’deya Abdel Karim from Mehalet Keil village (Abou Homos district, Beheira governorate), who owns and farms 2 feddans is an apt indication: “*Every time I go to the man at the station [i.e. the pump operator], he says it’s still not my turn. I don’t know why they put me last on the list.*”

Another group of women in Ezbet El-Sa’i village (Beila district, Kafr El-Sheikh governorate) complained that the irrigation times decided upon by “the men” (they did not know of the WUA) were insufficient for them to grow rice. As one of them - Sayeda Mohamed Moussa, a tenant on 5 feddans – commented: “*We can’t do weeding work on our rice crops unless there is water in the field. We hire laborers to do this. Many times after we hire them, we go to the field to find there’s no water. Each laborer costs us LE 15, so you can imagine what a loss this brings us.*” When confronted with this complaint, one of the male water users argued that the rotation times set by the WUA were adequate but that the root cause of the problem was lack of sufficient water in the secondary canal, and that they had complained to the irrigation District Engineer about it to no avail.

The fact that female water users are not consulted on irrigation turns was observed in all areas where IIP has been established. Moreover, none of the women had any idea of how the maintenance fees were determined and when asked who had decided on the amount very few of them were able to reply. Most of them reported that they paid the fees either

because they were obliged to do so (otherwise they would be denied their share of water) or because they trusted whatever decisions that were made by the male majority. Zarifa Saber, a widow from Ezbet Zaza hamlet (Sidi Salem district, Kafr El-Sheikh governorate) who farms 1 feddan, sums up this observation: *“All I know is that the man to whom I go when I need water [i.e. the pump operator] comes to my house at the end of each year to collect LE 100 from me, which is LE 50 per harvest. I don’t know what they are for. They told me that the men in our area decided this fee for the pump station, but that is all I know.”*

Conflict Resolution

Just as women were found to exert indirect influence over their male relatives with respect to crop selection, their role in indirect conflict resolution was in some areas prominent. To be sure, no female respondent reported that she interfered directly in conflicts between male water users over water. But in some cases, the indirect role played by women proved to be successful. Of these, the following case was particularly noteworthy:

Twenty-year-old Hend was a member of the Bahr El-Sheikh Ibrahim BCWUA (Sidi Salem district, Kafr El-Sheikh governorate). One day, as she was walking close to her field, she saw two of her neighboring farmers arguing violently over water share. One of them broke the field gate of the other in protest. Hend ran to the houses of their mothers and convinced them to go to the site of the dispute and calm their sons. When their mothers were finally able to convince them to stop their quarrel, Hend suggested that they consult the BCWUA Chairman as a mediator. In the end, and after the Chairman’s interference, the farmer who had broken the gate agreed to fix it and the water share issue was settled between the two parties.

4.4.3 Conclusion

Women who farm independently are the primary decision makers with respect to crop selection and water management within their fields, and they implement their decisions with little or no outside interference. They decide what crops to grow, when to irrigate, when to stop irrigation, and when and where to channel water within their fields.

The situation is different for farmers’ wives/relatives. When they are alone in the field, they can and do assume control. However, most of them prefer to delegate farming and water management responsibilities to their male relatives.

Women rarely take part in formal decisions, leaving their male relatives or field neighbors to assume direct authority. Therefore, when it comes to decision taking, most women are content to confer that responsibility to the men. Like the rest of their neighbors, they abide by crop selection decisions of the dominant few.

This observation is particularly evident with respect to collective decision making on water management issues. While collective decisions rarely take place in most areas, when they are practiced, the role of women is confined to that of passive – but not unwilling – acceptance of majority rule. This was observed with respect to water use and irrigation turns as well as maintenance (where collective decisions do not take place or where men are the primary decision makers).

However, the study findings indicate that with respect to informal decision making, farmers’ wives/relatives wield substantial control, advising their male relatives on the types of crops to grow for household consumption.

In some instances, women were also found to play an indirect role in conflict resolution between farmers over water use, by settling disputes through contacts with third parties.

4.5 Local Initiatives and Solutions

4.5.1 A Noteworthy Example

When Zeinab was younger, she could operate the irrigation pump all by herself. Now, as a sixty-one-year-old woman who farms her late husband's 0.5 feddans, she relies on her son to do that job for her.

But Zeinab is not happy and is seriously thinking of renting out her land. The reason: no water. Three years ago, she paid LE 350 to a well-known neighbor who was collecting funds for a community well. Although she now has water, she is not satisfied with its quality. *"There's nothing else we can do,"* she said. *"All of us have dug wells and we all irrigate from them. But the water from these wells is not good. The land never seems to get enough and I see white sand [chemical crystals] on top."*

As if that problem were not enough, Zeinab – like her neighbors – has to build mud barriers around her field when a downstream farmer decides to grow rice so that the excess water does not reach her land. Zeinab has found a way to cope with this problem. She has divided her land and grows rice on half of it that borders the *mesqa*; she grows cotton on the other half.

Zeinab Abdel Sattar – Sandanhour village, Banha district, Qaliubeya governorate.

4.5.2 Perceptions of the Water Users

The study findings indicate that women resort to the same methods as men to address their water management problems, and like the men, they are not satisfied with these solutions but accept them because they see no other alternatives.

4.5.2.1 Water Management Problems

The main water management problem in the Delta study area expressed by most groups is that of continuous water shortages. While as seen above (see *Knowledge of Water Management Issues*) most of them did not know the reasons behind such shortages, in some cases the male water users reported lack of or inadequate maintenance as the main factor.

None of the water users – with the exception of the men at El-Safayna village (Toukh district, Qaliubeya governorate) – mentioned drainage problems. A main reason for this lies in the spread of sub-surface drains in the Delta region.

In upstream Qena, where water is more abundant, farmers sometimes complained of *too much* water. The main reason for this is explained by Nabil Milad, General Director for Land and Water at the Qena Agricultural Director: *"Sugar cane [the principal crop in Qena] has made farmers lazy because it does not require frequent care like other crops. So what you often see is that farmers turn on their pumps late at night and then go to sleep or sit at cafes. When they finally turn their pumps off, excess water would have flooded their neighbors' lands."*

The main complaint of the Qena groups (as of all the rest) was the increasing price of inputs *vis-à-vis* the declining sale price of crop harvests.

4.5.2.2 Local initiatives

To address the problem of water shortage, water users in the study areas resort to one or more of the local initiatives outlined below. However, the majority of the groups do not perceive them to be effective solutions.

Direct Irrigation from the Secondary Canal

In some areas during times of water shortage – notably Qaliubeya – water users move their pumps or (if they do not own any) hire them and irrigate directly from the secondary canal. Farmers who rent pumps pay for this service by the hour, at a range of LE 2 to 10. No differences were noted between the behavior of the female and male water users. Pumps are hired on a first-come-first-served basis and no preferences are accorded to one water user over the other.

When water is plentiful at the secondary canal - a rare phenomenon in most of the study areas - this coping mechanism is adopted by the water users (female and male), even if it represents an additional cost for them in the case of pump hire.

It should be noted, however, that direct irrigation from the secondary canal is an illegal practice for which farmers can be penalized through payment of fines. However, this does not deter many farmers from resorting to this measure and in areas where IIP has been implemented and water is scarce, direct irrigation from the secondary canal is a common sight.

Irrigating from the drain

In some areas – particularly Kafr El-Sheikh and Daqahliya – farmers turn to drainage water to irrigate their rice plantations and other crops. This measure is adopted by all and gender discrepancies were not noted. In other words, female water users resort to drainage water like the rest. “*When there is no water, I go to my house and bring my pump. Then I ask my son or any passer-by to turn it on for me and I draw water from the drain,*” said Ghalya Sa’ad Soleiman, a widow from El-Qonn village (Sidi Salem district, Kafr El-Sheikh governorate) who farms 2 feddans.

While this is a common practice in many areas in the Delta region, the study groups are not satisfied with it, because they know of the harmful effects of drainage water on soil and crop productivity. In fact, driving through the study areas in Kafr El-Sheikh, white puffs of chemical foam were observed emanating from water discharged by all pumps irrigating from the drain.

“*We have a saying that ‘hot water is better than thirst,’*” said Ne’mat Saber, a widow from Ezbet Zaza hamlet (El-Riyad district, Kafr El-Sheikh governorate) who owns and farms 3 feddans. “*We know that water from the drain is not good, but it’s better than letting our crops die.*”

Digging wells

In most of the study areas, farmers depend on irrigation water from private or community wells. In fact, this initiative was found to be so rampant that in many areas (especially in Menufiya, Gharbiya and Daqahliya) farmers have ceased to rely on surface water to irrigate their crops.

Those who can afford to dig private wells were found to be few (15 or 8%, of which only 3 – 2.5% were widows whose late husbands had installed this service). In contrast, those who rely on community wells constitute the majority of the groups (154 – 86%).

No gender differences or gaps were noted with this initiative, which is resorted to by both female and male water users.

Just as water users are not satisfied with drainage water as a solution, they know that groundwater is harmful to their lands and crops. As Zeinab Abdel Sattar, a widow from Sandanhour village (Banha district, Qaliubeya governorate) who farms 0.5 feddans inherited from her husband puts it, the difference between surface and groundwater is “*like the difference between drinking from a tap and from a hand pump.*”

Yet, all the water users who resort to this measure claim that they have no other choice, mostly because all the other alternatives are, in their view, ineffective. This attitude is exemplified by the case of Hana Zaki Mohamed Abdel Alal, a tenant on 0.5 feddans from Ibnahs village (Qowesna district, Menufiya governorate) who farms on her own since her husband died 6 months ago: “*We now have to irrigate from one [IIP pump] station, but this is not enough for us. The water comes only for three days every two weeks. I remember my late husband used to walk many distances to find someone who would hire him a pump so he could irrigate from the main [secondary] canal. Of course, I can’t do this. If it wasn’t for the well, my crops would have died.*”

Contacting officials

The study findings indicate a gender gap in the employment of this initiative. In all the areas without exception, it is the male water users who decide upon and implement this measure, with no input from female water users.

Most women are unfamiliar with the local officials/institutions in their areas and thus have never contacted them. Even female water users who work at the agricultural cooperatives reported that they have not taken any formal initiatives in reporting water shortages.

The reason for this is the recurring comment made by almost all female water users and summarized in the words of Nagwa Mohamed from Mehalet Keil village (Abou Homos district, Beheira governorate), who farms 5 qirats: “*Contacting officials is the men’s responsibility. If there is a problem, they call that official by telephone, go to his office, or write a letter of complaint which the rest of us co-sign. I can’t see any of us [women] doing all that by ourselves. And why should we? What are the men for, then?*”

This comment is supported by findings from similar studies, such as that of Soumaya Ibrahim, in which female farmers in Minya governorate reported that they delegate their male relatives to speak and act on their behalf with officials and at formal activities. For example, one widow mentioned that she could write a complaint about water scarcity to the local

officials through the help of a male relative, but prefers not to be directly involved in any formal activity.⁶

However, it is important to note that while men take primary responsibility for initiating and pursuing this measure, the intended benefits and impacts are meant for all the farmers in the command area, including women who farm their lands on their own.

Nevertheless, all the groups without exception claimed this solution to be the least effective of all. The main reason they cited is lack of trust in the responsiveness and capability of local officials. This distrust has been borne out of previous experiences in which local officials promised to help them but ended up doing nothing.

“Last July there wasn’t any water at all in the canal. My neighbors called the Irrigation Engineer on his mobile phone. I don’t know his name and have never seen him. He came one hour later, checked the canal and promised he’d send us more water. Half an hour later, the canal was full. But no sooner had we all started our pumps than the canal dried out fifteen minutes after. So in despair, the men in our area collected money from us and dug a [community] well. That is what we are relying on now for water, but it’s not good because but it brings chemical deposits on our lands,” said Sa’deya Hassan Atta from El-Safayna village (Toukh district, Qaliubeya governorate), who helps her father-in-law farm 33 qirats.

Sa’deya’s story has been confirmed by similar cases in all the study areas (with the exception of Qena). In Meet El-Faramawy village (Meet Ghamr district, Daqahliya governorate) where the tail end of the secondary canal is completely dry as a result of garbage being dumped from the nearby residential areas, the male water users stated that they contacted the local MWRI officials several times to no avail. *“The irrigation engineer came himself and saw that the canal needs maintenance. All he did was promise us he would send the machines over but none came. So all of us now either irrigate from the drain or have dug wells,”* said El-Sayed Ibrahim, an owner and tenant. Similarly, another female respondent – Ibtessam Hassa, who also works at the agricultural cooperative of El-Shaheed Fekry village (Berket El-Sab’ district, Menufiya governorate) - reported that although the District Irrigation Engineer occasionally visits the cooperative and knows of the garbage blocking their secondary canal, he did nothing to help them address this problem.

In the end, therefore, water users do not contact local officials because they do not consider this an effective solution.

Waiting for Water

In many instances, the most that water users do when water is not available at the *mesqa* or secondary canal is to simply wait until it comes. Although this has a negative impact on their crop yields, the study groups admit that they do little else. This option is not favored by them because the waiting periods sometimes extend longer than anticipated. In the end, therefore, most of them resort to digging wells.

It should be noted that the act of “waiting” for water does not always imply passive behavior. In many areas, farmers resort to night or dawn irrigation, times when water is more plentiful. A substantial number of the female water users (47 – 40%) irrigate at night or

⁶ Soumaya Ibrahim. *Farmer Practices in Water Management: The case of Kom El-Mahras Village, Minya Governorate*. Cairo: MWRI, 2003, p. 14.

during the early morning hours. These women are not only the ones who farm on their own but many of them are farmers' wives/relatives.

This alternative is still not favored by the women (because of the inconvenience of walking to the field in the dark). To be sure, in some areas women do not opt for night irrigation due to social pressures that disfavor such an activity. However, most of the female respondents – out of necessity – have overcome this obstacle by taking their adolescent sons or male relatives along with them. Also, many farmers' wives mentioned accompanying their husbands for night irrigation to assist them.

Abandoning farming

With the rising cost of inputs and declining sale price of harvested crops, farming is no longer considered a profitable activity. This situation is aggravated by the lack of sufficient water to irrigate the crops selected by farmers, which - after the agricultural liberalization policy - have mostly centered on rice, vegetables or other water consuming crops.

In the end, most men have opted to abandon farming and have taken up jobs as day workers (in masonry or local factories) in their areas or in Cairo; many more have migrated to the Gulf countries. This means that more and more women are taking up farming in the place of their husbands or other male relatives.

Another implication is the increasing number of tenants, as landowners resort to this measure to free themselves of the hassles of farming. Indeed, out of the total respondents, a substantial number (165 – 92%) are tenants as well as being landowners. In many cases, the male tenants have taken over lands owned by female relatives who cannot cope with the hassles of farming and water shortages. One of these women, Shalabeya Ali El-Khouly from El-Sega'eya village (Banha district, Qaliubeya governorate), who has rented out her 1 feddan to a male cousin, explains the situation: *“Farming is not worth the time and effort I put into it. I work hard day and night and at the end, I can't get enough water to irrigate my crops. I pay a lot for fertilizer and seeds and the money I get is hardly enough to feed and clothe my four children. I have enough problems without having to worry about the land. It's easier to rent it out and let somebody else take care of it.”*

However, even the option of renting land is not considered a viable solution for many. The reason is explained by Manal Fathy Tantawi, Environmental Specialist at the Menufiya Agricultural Directorate: *“When you consider that a tenant has to pay LE 180 per qirat and LE 6-10 for a hired pump each time he irrigates his vegetables (which require frequent irrigation) in addition to paying for fertilizer, laborers and other inputs, you will find that he gets little in his pocket at the end of the year. The situation has been made worse by the declining price of crops like maize, which everybody here had planted. It is no surprise, then, that most of these farmers are in Cairo looking for jobs or have immigrated to the Gulf. How else can they feed and educate their children?”*

Moreover, given the high wages of day laborers (which can range from LE 20 to 50 per day), many of the study respondents openly claimed to resorting to this option in addition to farming their lands, in order to make ends meet.

In other words, therefore, this “solution” or final resort is being sought by more and more farmers. The gender implication of this mechanism is the increasing involvement of women in farming and water management as tenants, day laborers, or wives of men who have abandoned farming to seek better opportunities in other sectors.

4.5.2.3 Suggested Initiatives

Two alternatives were suggested to the study groups as possible solutions for their water shortage problems: a) seeking help from the WUA; and b) switching to other (water saving) crops. Both suggestions were strongly disfavored.

Seeking help from the WUA

As mentioned before, the majority of the female water users and few of the men lack adequate or even basic information on the *mesqa* WUA in the IIP areas included under the study. It goes without saying, therefore, that with such scant knowledge, water users would not consider the WUA a viable solution to address their water management problems.

The comment of Salah Mahmoud Sayed, a landowner and member of a *mesqa* WUA in Bisintway village (Abou Homos district, Beheira governorate) summarizes the dissatisfaction of the study groups with the WUA as an effective coping mechanism: *“The WUA has been formed to regulate water between us, when it is available. If water is not available, there is little it can do. The solutions are beyond its capability. Water shortage problems can only be addressed at higher [institutional] levels.”*

However, even higher level institutions such as the BCWUA are not considered by the study groups to be an effective solution. This attitude is expressed all the more strongly by the BCWUA members themselves. *“The BCWUA has been formed without any power of enforcement,”* said Abdel Mohsen El-Sayed, who owns 3 feddans and is a member of the board of directors of Hayatem BCWUA (El-Sega’eya village, El-Mehalla El-Kobra district, Gharbiya governorate). *“We write up an action plan for activities we can’t perform like canal maintenance or gate repair. The officials at the governorate look at the plan, sign their approval and then stuff it in their drawers without doing anything. And when we ask them what has become of our requests, they all tell us ‘yes, tomorrow, tomorrow.’ Tomorrow comes, nothing happens and our problems remain the same.”*

Switching to Other Crops

Given the unanimous complaints by most of the study groups of water shortages, the alternative of switching to other crops that consume less water was proposed to them by the researcher. The vast majority (170 – 95%) disapproved of this alternative, arguing that it is impractical.

Almost all of the groups who grow rice – even those in areas where they are not required to grow this crop, like Gharbiya and Qaliubeya – adamantly refused to try other crops, even though they complained of drastic water shortages and losses incurred this year due to the government decision to curb rice exportation. *“We have been born and raised on rice cultivation,”* said Fayza Saad Mohamed, a tenant on 2.5 feddans from El-Qonn village (Sidi Salem district, Kafr El-Sheikh governorate). *“We don’t know how to grow other crops. We tried to grow tomatoes and eggplants but we failed. In any case, we don’t want to stop growing rice. Even if it doesn’t fetch a good price, it can still feed us and our children.”*

The situation is similar to that of vegetables, from which farmers gain daily income. In governorates such as Menufiya and Qaliubeya, which are known for vegetable cultivation, frozen vegetable and pickles factories are firmly entrenched and depend on local produce; hence farmers’ reluctance to switch to other crops, despite the recurrent problem of water scarcity.

Similarly in Qena, there was vehement resistance by all water users (male and female) to allocate small portions of their lands for other crops that consume less water and may be more profitable than sugar cane. *“We can’t grow other crops like vegetables,”* said Aisha Aboul Hassan from El-Mafrageya village (Qos district), who owns and farms 3 feddans. *“For one thing, we are not used to planting vegetables. And more important, how can we market them? We [women] are prevented by local traditions from moving about to places other than our homes and fields. So we can’t go sell vegetables in the market; we can’t even sell them to our neighbors because that would mean that we would move around in the village.”*

Interestingly, strong resistance to crop change was even observed when the matter involved switching to other types of *the same* crop. According to Mohamed El-Tanbouly, extensionist at Meet El-Amel village (Aga district, Daqahliya governorate): *“Farmers are very stubborn. They resist any kind of change, even if it is beneficial for them and if it would not cause them any harm. I’m having a hard time convincing the farmers in my area to try the Giza 104 [rice] seedlings. They still want to use the older Giza 101 seedlings, despite the fact that we explained how the new seedlings are the same in taste and texture but that they consume less water. I’m already worried about spreading awareness to them about using the new Giza 105 seedlings.”*

In sum, therefore, the alternative of switching to other crops that consume less water and may be more productive was not regarded by the study groups to be a viable solution to their problem of water scarcity.

4.5.3 Conclusion

The main problem cited by the study groups is water shortage. To address this problem, they have adopted a variety of measures, of which digging private or community wells is the most popular. This and the other initiatives are adopted by both male and female water users and no gender differences in behavior or preference were noted. However, the majority of the water users are not satisfied with the efficacy of their initiatives as viable solutions to address their water management problems.

4.6 Participation in the WUA

4.6.1 A Noteworthy Example

Almaz was the only one talking at the meeting. The rest of those present – all of them men – were silent. They did not want to interrupt the interview out of deference to this sixty-year-old widow who was well-known and liked by all the villagers.

“I don’t mind participating in the WUA,” she said. *“If it will bring me benefits why should I refuse? Maybe through this association I can learn of new techniques to improve my crops. I can also tell my neighbors what I have learned and they can pass it on.”*

“Women shouldn’t feel shy about participating,” she adds. *“We do everything that men do and even more. I once went to Menufiya and saw the men all lounging in cafes while their women were working hard at the fields.”*

Almaz Habib, Bisintway village, Abou Homos district, Beheira governorate

4.6.2 Perceptions of the Water Users

Since the study focuses on on-farm water management decision making, the WUA at the *mesqa* is the water management institution that constitutes the basis of analysis. As the findings of the above parameters indicate, the study groups do not possess adequate knowledge of the functions and activities of the WUA and do not perceive it to be a viable mechanism to address their water management problems. It is not surprising, therefore, that most of them are not motivated to take up an active role in that association.

The findings below highlight the groups' attitudes towards female WUA membership as well as the reasons for the motivation of some women and the lack of it for others towards formal participation.

4.6.2.1 Female Membership

In all the study areas where IIP has been established, none of the *mesqa* WUAs includes women in its membership. Indeed, the executive regulations for *mesqa* WUAs do not stipulate female membership. Thus, even in the command areas that include female landowners, WUA membership is dominated by men.

The situation is different for the BCWUA, the internal regulations of which usually require the existence of a percentage of women in its Board of Directors as well as the Representative Assembly. Yet, it was found that such stipulations are not adhered to by some BCWUAs. For example, when the Bahr El-Sheikh Ibrahim was established in May 2005, its Board of Directors was comprised solely of male representatives, and it was only one year later (and with the encouragement of CARE) that female members were included.

4.6.2.2 Participation in WUA Meetings

Most of the male water users and a small minority of the women do not possess any substantial knowledge of the *mesqa* WUAs that were established in their command areas. They know the WUA members as neighbors or relatives and not in their capacity as water management representatives. As for the WUA activities, the majority of the women had scant or no information and contributed the maintenance fees without even knowing the purpose for which they were doing so.

Given this situation, it is not surprising that the water users – especially women – do not participate in WUA meetings. The men reported that apart from the first meeting to decide on the maintenance fees and irrigation turns, they do not participate in any formal WUA activity. Some WUAs hold bi-annual or annual meetings to discuss the maintenance budget with their members.

For the most part, however, and as Ahmed Abdel Fattah from Ezbet El-Sa'i village (Beila district, Kafr El-Sheikh governorate), who owns and farms 3 feddans remarked: "*The WUA is just an institution that helps us to organize our turns in irrigation and collects money from us for maintenance. Other than that, it does nothing. Sometimes the members are involved in solving conflicts between farmers. But that is not an everyday activity.*"

4.6.2.3 Perceptions of Women on Participation in the WUA

Participation is a Male Domain

In the areas where IIP has been established, most of the female water users had no inclination to assume a formal role as members in the WUA. Two reasons were cited:

1. A general distrust of the effectiveness and strength of the WUA;
2. The conviction that formal water management participation is a male domain.

These reasons are best described by the comment of Fatma Mohamed from El-Beida WUA (El-Riyad district, Kafr El-Sheikh governorate), who helps her husband farm 15 qirats: *“This association is for the men. What can I do in it? Do you think that I [as a woman] can solve the problems of the entire community? That’s the men’s responsibility. And in any case, this institution [i.e. the WUA] hasn’t done much for us. We still suffer from water shortages and the WUA hasn’t been able to help us because these problems can only be solved from above [i.e. higher institutions].”*

Many female water users mentioned a desire to know the reasons and outcomes of the regular fees that they are required to pay (i.e. for maintenance). Yet, they do not view formal WUA membership as a means to obtain such information. Again, this is due to the general conviction that formal participation is a male domain; women are therefore reluctant to take part in discussions or joint decisions with men in the framework of a WUA.

The feelings of Ne’mat Saber, a widow who farms 2.5 feddans in Ezbet Zaza (Sidi Salem district, Kafr El-Sheikh governorate) summarize the attitude of the majority of the female water users: *“I’ve never been used to talking in meeting with men. If I am in a meeting with me, I am sure that all of them will look at me unfavorably. Even if they say it is all right for me to attend I will sit quietly in a corner and will be afraid to say anything. These are meetings for men, not women.”*

Yet, an important observation has been noted. While most women provide the excuse of being overloaded with household duties and lacking enough time to take part in any collective activity, one underlying reason behind their disinterest is this general attitude that they would be trespassing on a responsibility that society has conferred on men. A strong proof of this is their response to the following question: *“Why is it, then that when a meeting is held at extension center or health unit on avian or swine flu or reproductive health that women find the time despite their daily chores to attend and participate actively?”*

The women’s response to this question was best expressed by Wafaa El-Sharkawy from Dalgamon village (Kafr El-Zayat district, Gharbiya governorate), who owns and farms 1 qirat: *“These meetings you are referring to are different. They concern us directly because it’s our responsibility to care for the health of our family. Anything that concerns the house and family is the responsibility of the women. Anything that concerns the land is the responsibility of the men.”*

Even women who farm on their own corroborated this sentiment. As one of them (Gamalat Badr, a widow from El-Sega’eya village – El-Mehalla El-Kobra district, Gharbiya governorate - who farms 15 qirats inherited from her husband) remarked: *“If I had a man to help me or to take the responsibility of the land off my shoulders, I would gladly leave it to him. I’m tired enough doing everything on my own. I have no time or energy left to take part in any meeting or activity.”*

Women do not benefit from the WUA

There is another reason behind women's excuses for not participating in water management activities. Although as mentioned above women are reluctant to take up formal collective action in the form of the WUA, the responses obtained from the study groups reveal that women do not see benefits accruing to them from formal participation in general and the WUA in particular.

According to Manal Fathy Tantawi, Environmental Specialist at the Menufiya Extension Directorate: *"Women will not join the WUA unless they see a personal gain from their membership. Even if the WUA is able to bring them more water, this is not an incentive for them since now most farmers have dug wells and are irrigating from them. Of course, they say that the water is not good for their lands, but as long as it produces yield at the end of the season, that's all they care about."*

Even the male water users adopt this attitude. Most of them perceive the WUA as incapable of addressing their interests. When it was suggested that the WUA could play a role in building consensus amongst the farmers on the crops to grow each season (to prevent over-irrigation and water disputes), most of the respondents stated that the WUA does not have any legal enforcement powers or any control over the farmers in order to achieve this.

Even within the BCWUA, female membership is not seen to generate tangible benefits. *"We have women in our BCWUA but their presence has not made any difference,"* said Abdel Mohsen El-Sayed, a member of the Board of Directors of Hayatem BCWUA, El-Sega'eya village (El-Mehalla El-Kobra district, Gharbiya governorate). *"Women came on board as representatives on the issues of environment and garbage dumping. But the BCWUA has no authority to implement activities in that domain. In the end, most of them are discouraged and remain in the BCWUA without taking any interest in it."*

4.6.2.4 Attitudes towards Participation in non-IIP Areas:

It should be noted that most of the female water users who were reluctant to take up an active role in the WUA came from the areas in which IIP had already been established. With the exception of a few, most of the WUAs in these areas had done little beyond allocating irrigation turns and collecting maintenance fees, tasks that most women believe can be achieved effectively by the men without their interference.

Interestingly, however, many of the female water users from the non-IIP areas expressed an interest in participating in this institution, of which they had heard almost nothing before the study interviews. The reason for this, as expressed by Ahmed Awad, General Director for Extension at Aga district (Daqahliya governorate) is that *"they are willing to try any suggestions coming from outsiders. They have done all they think they can do and their situation is still bad. So why not try something else?"*

This comment was aptly expressed by Hadwo El-Serr Abdel Aati, a tenant from El-Sega'eya village (El-Mehalla El-Kobra district, Gharbiya governorate) who farms 3 feddans with her husband: *"We've had no water for almost 6 months and our rice fields are not productive. [As tenants], we have to pay LE 6000 per year to the owner. We are at the end of the canal and water doesn't reach us. The men in our village complained to the extension and irrigation engineers but nothing happened. I'm willing to join any organization if it will help me solve this problem."*

4.6.2.5 How the WUA can Benefit Women: Suggestions from the Groups

When the female groups in the non-IIP areas were asked of the benefits that they would gain from a WUA, the majority mentioned the *communication of information*. This is not surprising given the findings stated earlier (see *Knowledge of Water Management Issues*) that indicate the low degree of knowledge of women on water management facts and issues.

The main item of information that these women seek consists of methods to increase land and crop productivity. The same response was gathered from the male groups.

In the IIP areas, many of the female water users stated that the WUA could be a vehicle through which they would learn of the decisions made by the rest of the farmers with respect to irrigation time and, particularly, maintenance fees. As Almaz Habib, an elderly widow from Bisintway village (Abou Homos district, Beheira governorate) who farms 5 feddans said: *“Attending the meetings of the WUA would make me know what I am paying for each year [for maintenance], to whom the money goes, and why my [irrigation] turn is after two of my other neighbors.”*

In the non-IIP areas, many of the women suggested that the WUA could help them in joint activities related to farming such as threshing of wheat and rice and marketing of crops. Such activities would be of special benefit to widows and other women who farm on their own. As An'am Mohamed, an elderly widow from Dalgamon village (Kafr El-Zayat district, Gharbiya governorate) who farms 1.5 feddans pointed out: *“If this association can help me rent a wheat thresher or market my crops, it would save women like me [who farm on their own] a lot of effort.”*

The suggestions of the male water users are more refined and detailed, a finding that is not surprising given their higher level of knowledge of the water management issues in their areas.

Many of the male groups and local officials, particularly those in non-IIP areas, envisage an important role for a WUA in mobilizing collective action for maintenance. Through this institution, commitment to payment can be better assured, and maintenance works supervised more efficiently.

For instance, Eid El-Shahaat, General Director for Land and Water at the Qaliubeya Agricultural Directorate recalls an incident in a village in Toukh district where farmers requested maintenance works on their mesqa. *“On the day of implementation, the contractor called me saying he couldn't do the job. When I went to the site, I found myself unable to walk on the banks of the mesqa for the trees and other plants that violators had planted. Farmers like these need a WUA to regulate mesqa maintenance.”*

Some water users emphasized the need to be involved in the planning and implementation of maintenance works. *“One day I went to the worker who was maintaining the mesqa and told him to postpone the job till the times when the rotation cycle is off. He refused to listen to me and almost ran me down with the bulldozer. This is unfair. We need to have a say in all this because these are our private mesqas,”* commented El-Sayed Imam Ibrahim from El-Safayna village (Toukh district, Qaliubeya governorate), who owns and farms 1.25 feddans.

In some areas where BCWUAs have been formed, members are calling for the establishment of *mesqa* WUAs to assist them with maintenance works. One such case is the com-

mand area of Dia El-Kom BCWUA (Berket El-Sab' district, Menufiya governorate), where the Chairman - Mohamed Khedr – has made formal requests to MWRI officials in this regard. As he explained: “*The BCWUA's command area is 6000 feddans and has 19 mesqas. Most of them are blocked with garbage or water hyacinths. All I was able to do was to convince the 60 farmers within the command area of my mesqa to pay for maintenance. But I can't do this for the rest of the command area. I need institutions like the WUA to help me.*”

The same need was expressed with regards to *marwa* lining. In the same BCWUA area, Khedr reported having to pay LE 1000 for other farmers who refused to contribute to the costs of covering of the 300 m long *marwa* running through their fields. This situation was observed in other areas, notably in Qena (El-Waqf district) where one farmer – Sa'd Mohamed Ahmed – stated that the *marwa* running through his land could not be fully improved because although he had paid for the lining of 250 m, the rest of the 1,250 m remained undone since the 5 other farmers within its command area had refused to pay for the improvement. According to this farmer, this situation can only be solved through the mediation of an association such as the WUA.

4.6.2.6 Perception of Men on Women's Participation in the WUA

In IIP areas, the study findings reveal a general disinclination of the male water users towards the concept of female participation in water management activities in general and in the WUA in particular. Again, the two main reasons given by them are that a) such activities fall under the responsibility of the men, who are perfectly capable of representing the interests of the community, including the women; and b) the interests and needs put forward by women (eg. water quality, solid waste management) fall beyond the scope of the WUA, making women's participation a futile activity.

In some non-IIP areas, however, a greater acceptance was found amongst the male groups towards female participation in water management activities. “*If it affects their daily bread, then why shouldn't women participate?*” commented Eleiwa Abdel Aziz from El-Safayna village (Toukh district, Qaliubeya governorate). “*Women these days do everything with us in the field. So why can't they join us in this association [the WUA] if it will bring us all benefit?*”

It should be noted that not all the men in the non-IIP areas shared such an opinion. In some areas (particularly Shebeen El-Qanater in Qaliubeya and Qena), the male groups were vehemently against the notion of formal participation for women. After much probing, the only plausible reason that could be deciphered was the difference in the social set-up of each area, with some villages being known for their open-minded inhabitants and others notorious for their rigidity. As one male respondent in Kafr El-Sohbi village (Shebeen El-Qanater district, Qaliubeya governorate) put it: “*We want to relieve women of this burden of participation. They have enough burdens on their shoulders. It would be eib [socially unacceptable] for us to ask them to share this responsibility with us.*”

4.6.3 Conclusion

None of the *mesqa* WUAs within the study areas included female members. This, coupled with the aforementioned lack of knowledge of women of water management issues and WUA activities means that their participation in the *mesqa* WUA does not exceed payment

of the maintenance fees and commitment to whatever irrigation turns and other decisions are decided by its male members.

As far as the BCWUAs are concerned, female members are present by virtue of executive regulation stipulations, but the role of these women is minimal owing to their incapability to implement activities that address women's needs (such as water quality).

In the IIP areas, most of the female groups are disinclined to take part in WUA activities because a) they view such a concept as a male responsibility and b) they do not believe that the WUA – given its incapability to enforce its decisions – can be of benefit to them.

In the non-IIP areas, however, many women were more inclined to assume an active role in the WUA which they believe can serve as a vehicle of information on the water management issues in their areas. The male groups in these areas envisage a role for the WUA in maintenance supervision and in mobilizing farmers to pay for *mesqa* maintenance and *marwa* lining.

As for the opinions of men *vis-à-vis* women's formal participation in water management, the groups were divided between acceptance and rejection. For the most part, however, the men were not enthusiastic about this notion out of the belief that they are more capable of representing the interests of the entire community. Indeed, this standpoint was also noted amongst many of the female water users, who were content to delegate the male members of their community to addressing their water management interests.

4.7 Gender Bias

4.7.1 A Noteworthy Example

The following conversation took place with three widows - Hana, Sobheya and Fawzeyya – in Ibnahs village, Qowesna district, Menufiya governorate:

Interviewer: *Do you know your neighbors at the field?*

Hana: *Of course. We're all like one family.*

Interviewer: *You said earlier that some of them grow crops that require large amounts of water that damage your lands. Do they think they do this purposely to you because you are helpless women with no men to defend them?*

Hana: *No, absolutely not. We are not the only ones who are affected. Our other [male] neighbors also face this problem.*

Interviewer: *What about those who rent out their pumps to you? Do they treat you fairly?*

Sobheya: *Yes, always. In fact, they give us our turn first so we could finish irrigating and go home to our children.*

Fawzeyya: *We're all like one big family. We have to care for each other because we are in the same area. There is no such thing as men versus women here nor in the other [rural] areas in general. Men in the countryside are known to be chivalrous towards widows like us; they are not like those in the city.*

Sobheya:

When water is scarce, we all fight with one another. At one time, I started to throw mud at my neighbor and screamed at him because he was not leaving me enough water. He was scared that the rest of the village would find out and give him trouble so turned his pump off. But soon after that, we became friends again. We don't do this to one another because we hate each other or because he's a man and I am a woman. If you are thirsty and someone brings you a very small glass of water that you have to share with another person, it's logical that both of you would fight over it.

4.7.2 Perceptions of the Water Users

All of the findings outlined above indicate gender gaps in certain areas such as information access and decision making, obstacles that undermine effective female participation in water management.

Yet, an important question should be asked: Do the women themselves feel that they are in an inferior position *vis-à-vis* the men?

This question was posed in different ways to the female water users who were asked if they felt that they were being treated unfairly by the men with respect to crop selection, water allocation, pump hiring and other issues related to their role and decision making authority in water management. Interestingly, all the female water users without exception denied the existence of any gender discrimination.

4.7.2.1 Water Allocation

In non-IIP areas, and if water is derived from a surface waterway, access is obtained easily through pumping, or if water is scarce, on a first-come-first-served basis. Naturally, those who suffer the most during those times are farmers whose lands are at the tail ends of the waterways. It may be argued that if these farmers are solitary women, they would feel even more disadvantaged because of their weaker gender status.

However, all the female respondents in this position in the Delta areas and in Qena did not complain of any discrimination in this regard. As expressed by Omayma Abdel Aziz from El-Shaheed Fekry village (Berket El-Sab' district, Menufiya governorate), who farms 4 qirats: *"We know that the farmers who scramble to get water before we do or who take up all the water during times of scarcity are doing so not because they want to hurt us. They simply want to save their lands, which is their source of livelihood. We are all in this difficult situation together and deep inside we know that in times of scarcity, it's every man for himself."*

The question of water allocation manifests itself more vividly in IIP areas, where farmers have to divide irrigation turns amongst themselves. As mentioned before (see *Participation in Water Management Decisions*), most of the female water users stated that they had not been consulted on such decisions and were compelled to abide by them.

Yet, when asked whether in this way they felt they were being marginalized by the rest of the farmers, all of them without exception responded that this was not the case. The response of Almaz Habib, a widow from Bisintway village (Abou Homos district, Beheira governorate) who owns and farms 5 feddans summarizes the sentiment of the female

groups in this regard: *“I trust the decisions that have been made by the men. After all, they are our village neighbors and we delegate them to act on our behalf on such issues.”*

Sometimes when the irrigation turns take place at times that are inconvenient for women, they resort to the men to assist them. For example, when Ghaliya Sa’d Soliman, a widow from El-Qonn village (Sidi Salem district, Kafr El-Sheikh governorate) who owns and farms 2 feddans was allocated her turn at 11 pm, she complained to the *Sheikh El-Mesqa* who agreed to swap her turn with that of someone who had a morning turn.

In the final analysis, and as aptly summarized by Fatma El-Seba’ee, a tenant on 2 feddans from El-Shaheed Fekry village (Berket El-Sab’ district, Menufiya governorate): *“We’re all neighbors and have to get along together whether we like it or not. We all suffer from the same problems. Sometimes my neighbor lets go of his rights for my sake and other times I do the same.”*

4.7.2.2 Crop Selection

The same findings were reported with respect to crop selection. The liberalization of agriculture and the subsequent cancellation of the fixed crop rotation cycle have meant that each farmer can individually decide on the crops to cultivate without consulting his neighbors or anyone else in the command area. As seen above (see *Participation in Water Management Decisions*), this in many cases causes problems when crops that consume high quantities of water are grown next to others that do not.

However, all the female water users in all the study areas reported that this is not a gender problem and affects male farmers as well. *“Many of us whose lands are flooded by extra water are men, not women,”* said Amal Hussein from Sandanhour village (Banha district, Qaliubeya governorate), who helps her husband farm 0.5 feddans. *“This is a problem that affects us all, not just the women. But what can we do? We know that the farmers who are growing vegetables and flooding our lands with excess water have no other choice. Most of them are employees whose salaries are barely enough to keep their houses going. So they have to grow vegetables to feed their children.”*

4.7.2.3 Hiring of pumps

To address the problem of water shortage, most farmers in the study areas have resorted to digging private or community wells. Those who resort to irrigating directly from the *mesqa* and secondary canal and who do not possess their own pumps are also obliged to rent them.

The female groups were asked if the pump owners gave priority to the men in hiring out the pumps; all of them without exception responded that this is not the case. In fact, most of them stated that it is the women who receive priority because of their gender status and responsibilities. As Sa’deya Hassan Atta from El-Safayna village (Toukh district, Qaliubeya governorate), who helps her father-in-law farm 33 qirats, explained: *“The man who hires the pump always lets me use it first so that I could finish irrigating early and go home to my children. Once during the summer when water was very scarce, my turn to use the pump came at 1 am and I was alone. My neighboring farmer finished his turn and then sat to wait for me till I finish so he could escort me home.”*

4.7.2.4 Treatment of women who farm on their own

In brief, therefore, the female water users do not complain of any bias against them by their male compatriots. In fact, the vast majority of them (115 – 97%) stated that women who farm on their own – including even farmers’ wives/relatives who are present at the field without their male relatives – are given priority over men because of their “weaker” gender status. This priority takes the form of assistance in some farming and water related tasks such as ploughing and operating the pump as well as other matters such as pump hiring as seen above.

“[In rural areas] it would be extremely eib [socially unacceptable] for a man to mistreat a woman. Everyone would start talking about him as a wicked person. So as widows, we are treated better than other women because everyone knows we are helpless and weak, struggling for our daily bread,” said Hoda Abdel Rahman, a young widow from Meet El-Faramawy village (Aga district, Daqahliya governorate) who farms 10 qirats.

In fact, some women take advantage of their gender status to defend themselves or fight for their rights. *“If a man tries to take my turn [in irrigation] I would not keep quiet. I’ve had many fights with my neighbors. They are afraid of us [women] because we can scream and make a scandal for them. So they can never mistreat us,”* said Salma Mohamed, a widow from El-Mafrageya village (Qos district, Qena governorate).

Most of the women who hire pumps reported that the owners treat them fairly and even help them drag the pumps over to their fields and operate them. One female water user – Aziza Ahmed from Dalgamon village (Kafr El-Zayat district, Gharbiya governorate), who owns and farms 7 qirats, said: *“The pump owners always give us [women] priority. In fact, if I take a man with me, he may put off my turn for later.”*

4.7.2.5 WUA membership

As mentioned before (see *Participation the WUA*), most of the female water users are disinclined to take up formal participation in water management through WUA membership. When probed further, they stated that associations like the WUA and other forms of collective formal participation are the prerogative of the men and saw little or no role for themselves in that domain. In other words, the female groups do not believe that WUA membership is biased towards men.

In the areas where IIP has not been established, many of the female and even male groups welcomed the notion of women’s participation in the WUA provided that it results in tangible benefits to the latter.

4.7.3 Conclusion

The majority of the female groups do not feel that they are being treated unfairly by their male compatriots in farming or water management issues. Even when facts indicate the monopoly of men over decisions like water allocation and pump hiring, these acts are not seen by women to be based on gender discrimination. As supported by the responses of the men, the inconveniences that occur in such domains are borne by the male farmers as well as the women.

In fact, most of the groups stated that preferential treatment is accorded to widows and other women who farm on their own by virtue of their vulnerability as solitary women with multiple responsibilities that they have to bear without male help.

5. Summary and Conclusions

The findings of the study point to the existence of gender gaps in certain crucial aspects of water management, a factor that inhibits and discourages women from taking up an active role. The following conclusions are particularly noteworthy:

5.1 Where Gender Gaps do NOT Exist

When it comes to farming and water management tasks, access to resources and coping mechanisms, the status and situation of women was found to be similar to that of the men and no gender gaps were noted. Women perform the same farming tasks as men (with the exception of heavy work like land leveling for which they hire laborers or call on their husbands or male relatives to assist them). The notion that women cannot plant rice owing to the need to lift their garments and wade into the water has been disproved by the female respondents in the rice growing areas, all of whom participate in this activity.

Similarly, the notion that women do not irrigate because they cannot operate the irrigation pumps is incorrect because a) operating the pump is not an obstacle for women, since they call on men to assist them; and b) the task of irrigation is not confined to the physical act of pump operation but involves more profound aspects like deciding when to irrigate and channeling water into the field.

Women have the same access to farming and water management resources as the men. Both are free to purchase their agricultural inputs from the cooperatives and/or local sellers; harvesting and marketing resources are available and accessible to all, as are water management resources such as pumps for hire.

Furthermore, the initiatives and coping mechanisms employed to address water management problems are adopted by both women and men and are meant to benefit all water users with no bias or preferential treatment towards any gender. Thus, women benefit equally as men from community wells, pump hiring and other local initiatives. Although they do not participate in contacting officials, the majority of the female respondents reported that they were content to defer this task to the men and trusted their actions and opinions.

In these domains, therefore, women enjoy the same status and decision making power as the men and no preferential treatment or discrimination factors were observed.

5.2 Where Gender Gaps DO Exist

The biggest difference between the status of women and men was observed in the domain of information. Compared to the men, the female respondents displayed a level of knowledge that was markedly inferior. Women have superficial or no knowledge of their water management situations, and compared to the men, their information sources are secondary (i.e. their husbands or male relatives, neighbors, or plain hearsay). Apart from a desire to learn of new techniques to improve productivity, the female groups did not exhibit a strong motivation to obtain information on water management issues, even those that have a direct bearing on their daily livelihoods (like the reasons for water shortages).

Water management decision making is another domain where a gender gap was noted. Although women were found to play a substantial *informal* decision making role in advising

their husbands/male relatives on the types of crops to plant, their *formal* decision taking role and participation in collective decisions is negligible, if not absent. This finding was particularly manifest in IIP areas, where the majority of the female groups reported that they did not take part in decisions on irrigation turns and maintenance fees.

Given this situation, it is not surprising that the role of women in the WUA is non-existent. They do not participate or even know of its meetings, and in IIP areas, are not inclined to take up an active role as members. Here, it should be noted that the male water users in the IIP areas were equally reluctant to assume an active role because they do not regard the WUA as an effective mechanisms with legitimate decision making authority.

5.3 Women do not complain of gender bias

An interesting factor that was noted in the findings is that the women themselves do not complain of any gender bias. Although their responses clearly point to gaps in crucial aspects of water management, they do not see themselves as victims of male domination nor are they reluctant accepters of the *status quo*. If they are not involved in certain decisions, it is not because they are marginalized as women. In fact, most of the female groups proclaimed water management decisions and actions to be the primary responsibility and prerogative of the men; also, many of them do not see any tangible benefits accruing to them from formal participation.

The fact that women play a substantial role in farming and irrigation is not a strong incentive for them to take up an active formal role in water management. They farm and irrigate out of sheer necessity and due to harsh living conditions that force them to pick up the axe and work to feed their children. To ask them to take on additional responsibilities like WUA membership would be – in their view – to increase their burdens. This perception is all the more enforced by the weak role of the WUA at *mesqa* and branch level as a partner with the MWRI in water management decision making and implementation.

In light of this situation, women are more than content to take a back seat in water management decisions and activities, preferring to delegate such tasks to their male compatriots.

6. Analysis of Findings

A close examination of the findings of the study has revealed conclusions that have far-reaching implications for the situation of agriculture and water management in Egypt in general and the status of women in particular.

6.1 The Feminization of Agriculture

As the study findings indicate, farming is no longer considered a profitable activity. In fact, many of the water users interviewed in the study were seriously contemplating or had already abandoned farming in favor of other income raising alternatives. They are being pushed towards this option by the three factors mentioned above: The increasing cost of agricultural inputs (mainly seeds/seedlings, fertilizers, day laborers and pesticides); the low sale prices of crop yields for standard “cash crops” (particularly cotton, maize, sorghum, rice and wheat); the unavailability of adequate surface irrigation water.

For the average farmer, the situation is aggravated by factors such as inflation, the high prices of services such as health and education, and a changing lifestyle defined by a growing demand for consumer items. Given the small sizes of their landholdings, most male farmers are being driven to seek alternatives as laborers in local factories or employees in local governmental institutions (where they can be guaranteed health services and social security). Many more are seeking work in Cairo or overseas.

The consequence of this “male drain” is that more and more women are taking up farming in place of their husbands/male relatives. If the latter work in jobs in the area, they assist their women in the evenings, on weekends or holidays. Otherwise, women have now become the main laborers and even decision makers in many areas.

The feminization of agriculture is also taking place on another indirect level. Given the low profitability of crops such as rice and wheat and the small size of most landholdings, more and more farmers are deciding to use the bulk of these crops for household consumption and animal husbandry. Since these two domains fall within the responsibility of women, their indirect influence on decisions related to these crops - which was noted in the study findings (see Water Management Decisions) - is expected to increase.

Therefore, although most of the female study groups do not realize this, farming is fast becoming a female domain. The gender implication of this is that women will inevitably be intensely involved in water management in the near future.

6.2 Participation should bring about benefits

Given the above conclusion and the apathy of the female study groups, the following question begs itself: if women are expected to play a substantial role in water management in the near future, how can their motivation for participation be promoted at the *current stage* in order that they may be ready to assume that role?

The study findings provide a simple yet far-reaching answer: ***women can be willing and capable of participating in any activity as long as it brings them tangible benefits.*** In light of this, the common excuses provided by them such as social restrictions, lack of time to attend meetings, and household burdens should be taken with a grain of salt. As local officials and most of the female groups themselves admitted, women would leave everything

behind and make the time to attend meetings on topics such as family health and avian / swine flu that affect them directly and lie within their primary domain of responsibility.

The problem is that women do not regard water management to fall within their primary realm of responsibility, even though they are heavily involved in day-to-day water management tasks. The findings have shown that when women have individual problems, their degree of motivation and activity is intense and they would go to any lengths to realize their interests and solve these problems. When these actions take on a wider dimension, however, we find women taking a back seat in decision making, preferring to free ride on any actions adopted by the men.

During these cases, women provide the proverbial response that water management is a male domain. After a close analysis of the findings, it can be argued that even this perception is yet another excuse offered by them to disassociate themselves from formal collective action.

Rather, the reason behind such declarations is that women do not see a direct benefit accruing to them from participation. As one of them put it: *“The men have tried everything. They’ve tried calling the local officials but nothing came of that. They’ve tried to talk to neighbors about growing crops that do not harm others but no-one has listened to them. What can we [women] do that they could not do?”*

In short, water management participation by women cannot be successful unless there are effective channels that can address their needs and bring about tangible results.

7. Recommendations

The findings of the study have been primarily based on the personal opinions and perceptions of water users towards the concept of collective participation in general and the role of women in particular. This approach has an important implication. Although facts highlight the existence of a gender gap in crucial areas such as knowledge and decision making, the *perceptions* of the water users indicate their indifference to it. In other words, this gap is not a cause for alarm or discontent for women and they are reluctant to participate in any formal measures to address it.

The main reason put forth by the female respondents for their seeming apathy is that water management is regarded by all to be a male domain. Yet, the fact that more and more women are taking up farming and irrigation on their own – as men abandon the land seeking more lucrative alternatives – means that this will no longer be the case in the near future.

In other words, ***water management will perforce be a female domain as well***. Whether they like it or not, women will be obliged to take up a more visible and substantial role. They may not envisage this situation now, but economic factors are pushing them to become *de facto* decision makers and key players in water management.

The question to be asked, then is how can the Government of Egypt assist women in preparing for that role? Three measures can be envisaged by the Government of Egypt with the ministries concerned: Reduce the knowledge gap; strengthen appropriate forms of groupings and associations and revisit the concepts of gender and participation.

7.1 Reduce the Knowledge Gap

As the study findings indicated, women lack essential information on their water management situations. How can they therefore be expected to take up an active role if they do not know the names of their *mesqas* or local officials, or even the causes of their water scarcity problems?

Information dissemination is thus a *sine qua non* for female participation in water management. Whether the women then use this tool to play an active role in water management is a decision that only they can make. No amount of seats in the board of any association can guarantee their participation; they must be the ones to decide to sit at the water management decision making table.

omen who are involved in farming can be provided with training in which essential water management information and skills can be imparted. This would not only enable them to advise their husbands and male relatives more knowledgeably, but (particularly in the case of women who farm on their own) it would make them better aware of their water management situations and capable of effective participation.

However, ***before proceeding with a training program on water management, it is strongly recommended to start with giving them basic information on agricultural techniques***.

Given the desire expressed by all the study respondents for information on agricultural techniques and practices to raise productivity, it is recommended that the training begins with these practical topics.

Other subsequent topics for training would include: basic water management facts (eg. the characteristics of the command area at *mesqa* and secondary canal level, the irrigation and drainage system, local institutions involved in water management, operation and mainten-

ance (O&M) of the hydraulic infrastructure); the purpose and benefits of water management participation; communication and presentation skills; and gender participation in water management.

It is important to point out that such training should also be provided to the male water users, since they are the prime actors in water management. Also, activities that are directed solely towards women may antagonize their male compatriots and nurture feelings of bias.

Since extension workers are the mediators between the agricultural and irrigation administrations and the water users, they need to be sensitized to the gender issue, as well as the approaches to follow to ensure that all water users participate without antagonizing any category.

In particular, it is important to capitalize on the existence of female Rural Development Specialists (RDSs) in the extension centers in the Delta region. In most cases, these women come from the same villages in which the extension centers are located, or from nearby villages. Indeed, almost all of the female RDSs encountered during the study were themselves farmers who owned and/or farmed their lands like the rest of the water users in their areas. Moreover, it is the responsibility of these RDSs to communicate extension and awareness messages to women in their areas; indeed, during the time of the study, many of them were intensely involved in spreading awareness messages on avian/swine flu and reproductive health. Training these employees would thus facilitate outreach to the rest of the women. The main obstacle encountered by the RDSs in communication is lack of adequate transportation. However, since most female landowners have to visit the cooperative to purchase fertilizer and other inputs, a program and procedures of communication can be agreed upon with the RDSs for dissemination of messages to these women.

In addition, they can be designated to communicate and spread such information amongst *widows* – a category that was found to be one of the most deprived of knowledge, since unlike women who assist their male relatives, these widows have few sources from which to obtain information. If outreach can be achieved amongst this category, it would be a significant first step towards information dissemination to women.

7.2 Strengthen appropriate forms of groupings and associations

The policy of the MWRI is predicated upon the WUA as the primary mechanism through which water user participation can be encouraged and promoted. Yet, this approach can only bear fruit if the WUA is accepted by all stakeholders in the field of agricultural water management, especially by the local agricultural administration and by the agricultural or cooperative field staff.

In the case of the *mesqa* WUAs which have been created in a top-down approach, this is not the case. Apart from allocating irrigation turns and maintaining the collective pump stations, *mesqa* WUAs do not play a substantial role in water management decision making and are not regarded by their constituents as effective mechanisms to realize their interests and solve their problems, which encompass agricultural as well as irrigation problems.

The situation, it can be argued, is worse at the branch level. To be sure, the stipulations in the executive regulations of the BCWUA to include women within its membership ranks represents a step forward in encouraging their active participation. However, these female members are powerless to implement activities that address their interests because the BCWUA itself lacks the decision making and implementation authority. This is the case

because of the lack of a legal base which could be created by an announced amendment of the irrigation law No 12 from 1984.

Since the study focuses on on-farm water management, and because at this level women can see direct benefits, it is recommended that appropriate groupings of farmers and support structures like the so-called *marwa* committees be encouraged to take on more profound roles than the ones they are currently assuming. These roles, it should be pointed out, would not be directed solely towards women; yet, their benefits would accrue to them as water users within the same command area.

The *mesqa* WUA and the *marwa* committees for example, can be encouraged to take on additional collective roles that strengthen its image as an organization for the benefit of water users. Based on recommendations made by the study groups, they could mobilize the water users within its command area to contribute towards laser leveling and *marwa* lining. Although these activities are already being implemented by the MALR with its agricultural extension service in many areas, the WUA could add a measure of control and commitment through formal procedures and organized steps.

The *mesqa* WUA – like any other cooperative organisation - could assist water users in obtaining joint access to certain services like wheat/rice threshers, good quality fertilizers or pesticides from reliable merchants, etc.

Many female groups – especially those who farm on their own - also requested the assistance of an association in marketing of their crops, a task that needs a collective organized fashion.

7.3 Revisit the Concepts of Gender and Participation

As stated in the introduction of this study, gender participation in water management is a policy that is espoused and encouraged at all levels by the MWRI. However, for this policy to be effective, certain preconceptions and notions of gender need to be revisited.

7.3.1 Gender is not Women Empowerment

Despite the proliferation of studies that warn against confusing gender with women empowerment, development initiatives for the most part fail to make that distinction. Implementation plans start out by stressing on the need to address both men and women but then gradually center more and more on activities that are directed solely towards women and aimed at providing them with powers that may not be condoned by their societies.

Given the patriarchal nature of Egyptian rural society, it is imperative to include men as target groups in gender activities and to convey gender messages in a way that does not place them in an awkward social position.

7.3.2 Participation should bring benefits

Moreover, the sheer number of female members in a WUA is not a sufficient indicator or their participation, although it is a first step. ***Participation of women should not be viewed as an end in itself***; it should not be pursued for its own sake. If such participation does not bring tangible benefits to women, they will turn to nominal members and lose interest in the WUA. To implement an effective gender strategy, therefore, a development initiative must include measures that can address women's needs (possibly by engaging other parties in an integrated approach).

References

Abdel Aziz, Yehia. *Sustainable Irrigated Agriculture: Role of Farmers' Participation in Egypt*. Cairo: MWRI, 1994.

Fayoum Water Management Project. *Women in Irrigation: Study on the Role of Women in Irrigation in the Pilot Area of Abu Sir*. FWMP: Technical Note No. 42, October 1997.

Gouda, Dalia. *Final Report of the Monitoring Farmers' Perceptions in the IIIMP Pilot area (W10)*. Cairo: Agricultural Water Management Project, November 2008.

Ibrahim, Soumaya. *Brief Overview on the Current Situation on Gender and Water Management in Egypt*. Presentation at IDRC Gender and Water Management Workshop, Beirut: July 2006.

Ibrahim, Soumaya. *Gender Analysis of Irrigation Activities and Water Resource Management: the Case of Several Villages in Minia Governorate*, part 2. Cairo: MWRI, 2002.

Ibrahim, Soumaya. *Farmer Practices in Water Management*. Cairo: MWRI, 2002.

Radwan, Hanan. *Female Farmers in Egypt: Their Water Management Interests and Coping Mechanisms*. The Water Boards-IIIMP and the Egyptian NGO Support Center. Cairo: December 2007

United Nations Development Programme. *Mainstreaming Gender in Water Management: A practical Journey to Sustainability: A Resource Guide*. New York: UNDP, February 2003.

UNDP and Gender and Water Alliance. *Resource Guide: Mainstreaming Gender in Water Management, version 2.1*. New York: UNDP, November 2006.

Water Boards Project. *User Participation Through Water Boards: An Evaluation of the Effectiveness of the Representative Assembly of Water Boards, especially with Respect to Residential Interests and Gender*. Cairo: WBP, July 2005.

The World Bank Participation Sourcebook. Washington, U.S.A.: The International Bank for Reconstruction and Development/The World Bank, February 1996.