Final Report

Farmer Awareness and Behavior Related to Limited Water: A Study in Three Egyptian Governorates

(El Fayoum, Aswan and Dumiat)

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Ministry of Public Works & Water Resources, Egypt

with assistance from
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Dr. Laurie Krieger
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EXECUTIVE SUMMARY

In order to develop its first multi-media mass communication campaign on water scarcity, the Water Communication Unit (WCU) of Egypt's Ministry of Public Works and Water Resources (MPWWR) needed information on current attitudes, beliefs and practices of Egyptian farmers regarding water. The campaign was to be focused on rural people. With financial and technical support from USAID/Egypt and the USAID-funded Environmental Education and Communication (GreenCOM) Project, a team from the WCU received qualitative research training. They collected data in rural Egypt using focus groups and in-depth interviews.

The study focused on whether farmers know that Egypt is facing a serious water shortage in the near future and if farmers are currently practicing any water conservation behaviors. The research team discovered that although farmers have a limited awareness about Egypt's national water scarcity, they are acutely aware of local water shortages. There is an overall perception that the irrigation water supply has improved since the building of the Aswan dam but that current supplies are affected by canal pollution. Some people discussed their perceptions that future supplies are threatened by growing population.

For this study, the term, "water conservation behaviors" has been used to describe a number of behaviors related to use of irrigation water. These behaviors include old behaviors which the farmers have always practiced and some new behaviors. Most of these behaviors involve the more efficient use of water. In some cases, farmers are able to reduce their net requirement for water and for others, these behaviors allow the farmers to redistribute their water allocation in a new way and has not resulted in a net savings of water.

Methodology

Prior to carrying out the research, WCU staff members received two days of training at the MPWWR and two days of field experience. The training focused on two qualitative research methods - focus group discussions and in-depth interviews. In addition, the training included segments on qualitative research in general, research bias and ethics, interviewing skills, participatory rural appraisal, gender analysis, research planning, data analysis and application to communication programs. The WCU team then conducted two practice focus groups and a few in-depth interviews in Qalyubiya Governorate. This experience provided them with hands-on practical experience and allowed them to pretest the focus group discussion guide and interview schedules.

The WCU research team conducted research in three governorates which were chosen by the MPWWR- El Fayoum, Aswan and Dumiat. From an engineering standpoint, these places exemplify three different irrigation conditions. The Undersecretary in each governorate used the following criteria to select villages for the research:

- the great majority of villagers derived their livelihood from farming;

- the villages in the governorate were located at varying distances from the main town;
- the village mayor, or head of the cooperative, was willing to participate in the study; and
- whenever possible, local women were involved in farming.

A minimum of two focus groups, one with men and one with women, were held in each village. Individual in-depth interviews were distributed among the villages. The study design originally called for an equal number of male and female farmer focus groups to be held in each governorate. Each focus group was to have been homogenous for age (less than 40 years old and greater than or equal to 40 years old) and location of farm plot along the *mesqa*. In addition, wherever possible, the people in the male and female groups were to have been spouses so that concurrence in decision-making could be assessed. A final criterion was that everyone work as a farmer, unless it was an area where women do not work on the land. However, the group criteria proved to be quite difficult to implement:

- people of the same educational level seemed to feel most comfortable talking together, regardless of their ages;
- because people often owned or rented multiple farm plots in different locations and often farmed differently on different plots, relatively few focus group participants could be grouped homogeneously by their location along the *mesqa* and this variable could not be used as a reliable predictor of water conservation behaviors and awareness of water scarcities for farmers;
- focus group participants turned out to be those who were available at the time of the group interview;
- although the team held focus groups at times when farmers are usually home from the fields, it proved very difficult to obtain married couples for the focus groups.

All focus group participants did meet the criterion that they be farmers or members of farmers' households. Over the course of a twelve-day period in August and September, 1996, the research group conducted:

- 20 focus groups (10 for men and 10 for women)
- 19 in-depth interviews with key informants

A total of 168 people participated in the focus groups and interviews. In all focus groups, the moderator was the same gender as the participants. Except for one case, notetakers were also the same gender as the participants. Focus groups lasted from one to three hours, with most taking about one and one-half hours.

The individual in-depth interviews used semi-structured interview guides. These interviews provided a point of comparison with farmers' views and served as a cross-check for farmers' perceptions of the water situation and MPWWR, just as the farmers' perceptions served as a cross-check for the individual interview respondents' viewpoints.

The research team analyzed the data as they worked in order to have themes immediately ready for the September-October communication campaign. Each evening, the notetakers and moderator made an English summary of the day's notes. Also, the team gathered to listen to the day's two notetakers read their notes. Afterwards, the entire team discussed and decided upon the themes that arose in each focus group. As the research progressed, the team was able to compare the themes among different groups and different sites.

Water-Related Findings

Although each village studied faces a unique set of circumstances and reacts differently to water-related topics, similarities in experience between villages in a governorate, and even among El Fayoum, Aswan and Dumiat, emerged in the focus group research. The ten topics below are covered in greater detail in the body of the report and provide the basis for later theme recommendations.

1. Water Scarcity

Many male farmers denied there was a water shortage in Egypt, with one male focus group citing information from mass media sources as supporting this conclusion. A few focus group participants of both sexes, all of whom identified themselves as regular TV watchers, connected population growth to water scarcity. Other farmers connected their local situation to that of the rest of Egypt. A few farmers who had worked in the Gulf states viewed Egypt's situation as favorable by comparison.

2. Concept of Egypt's Irrigation System

The vast majority of people knew that the Nile is the source of Egypt's water for irrigation and they also knew that the Nile provides water to their canal. However, not everyone knew or cared about the source of the Nile, especially illiterate respondents. Rural farmers did know that control of the gates to the canal and cleaning of the main canal is the responsibility of the MPWWR. Most farmers interviewed thought that the secondary canals, (*mesqa*/*bahr*) were private and that the responsibility for maintenance belongs to them. The term "*mesqa*" was not widely used. Instead, "*bahr*" was preferred. Some farmers believed the Ministry should clean the *bahr*.

3. Irrigation Management

In the view of the farmers, the entire irrigation system is managed by the Ministry of Irrigation. Farmers do not understand Ministry decisions or the reasons behind irrigation laws. Farmers are usually not acquainted with the District Irrigation Engineer, a MPWWR employee, and they generally do not have favorable views of this official. Many farmers have tried to influence the MPWWR through oral or written complaints to both local irrigation officials and other officials outside MPWWR at the national level, but with limited success.

4. Farmer's Role in Irrigation

Disputes over water occur among farm households when people water out of turn (farmers are given "irrigation appointments" by MPWWR) or borrow a pump and do not return it on time. Women's water disputes largely center around disposal of waste water. Often, the MPWWR is viewed as both policeman and judge in water disputes. On the other hand, people also cooperate around water. Farmers jointly clean the secondary canals and participate in joint decision-making with neighbors about what crops to grow is common. The primary reason for the latter is to ensure that everyone gets the same amount of water.

5. Pollution

Pollution is a problem of serious concern among farmers. Farmers at the end of the *mesqa* who often experience water shortages blame pollution in the *mesqa* and main canal. The contaminant most commonly mentioned was dead animals such as donkeys. Sewage and nightsoil from septic tanks, household waste water, factory sewage, and waste from Ministry of Health clinics and hospitals was also mentioned. Farmers complain there is nowhere else to throw sewage and garbage besides the *mesqa*. Women do the majority of the dumping of household-related waste.

6. Water Shortage

Each village has its own factors producing water shortages. In general, however, those at the end of the *mesqa* suffer water shortages. Dumiati farmers expressed the most complaints about shortages, with some participants claiming they have occasionally resorted to using water from the faucet for irrigation.

7. Water-Saving Practices

Farmers engage in a variety of practices that result in saving water. Most of these behaviors involve the more efficient use of water. In some cases, farmers are able to reduce their net requirement for water and for others, these behaviors allow the farmers to redistribute their water allocation in a new way and has not resulted in a net savings of water. When asked why these practices were adopted and maintained, farmers did not always use water conservation as their explanation. For example, virtually all farmers in all three governorates said they watered at night, but differed in their reasons. There are regional differences by gender. Women and their families are concerned about safety at night but for women without adult men in their households, they may have no other options. Everyone asserted that they level their land. Farmers engage in other practices as well, even when they do not perceive that they have a serious water shortage. For the most part, the behavior of farmers is characterized by flexibility and practicality.

8. Crops

In choosing which crops to plant, farmers take several factors into consideration:

- Amount of land available
- Amount of water available
- Type of soil

- Probable income
- Amount of work required to grow the crop
- Crop previously grown on the land
- Season
- Household needs
- Logistics of marketing

Many farmers consult their neighbors. Cooperatives in some areas may be influential as well. Women across all three sites strongly expressed the need for food self-sufficiency, especially in El Fayoum. Rice is a favored crop for both home consumption and sale and both men and women have strong feelings about the government fine on rice growing.

9. Meanings of Water

Water is viewed as bringing life to plants, animals and humans. It is considered a gift from God to the world. Yet, villagers also recognize that agricultural water has become contaminated by foreign objects. Participants often contrasted the natural state of life-giving water with the death and disease-causing polluted water, especially in Dumiat. This information, both the symbols and the language, may be important to use in communication campaigns.

10. Past, Present, Future

The past is considered to be the time prior to construction of the High Dam. With the exception of Dumiat, most people say the present is much better than the past due to the following reasons:

- the addition of another crop season;
- increased water quantity resulting in increased productivity;
- ease of irrigation;
- better drinking water (in some areas);
- the water is free of red clay;
- increased education for women/lessening of women's role in agriculture;
- greater use of labor saving devices that reduce women's work load (e.g., tap water, washing machines, septic tanks) and the entertainment provided by television.

Many study participants discussed the increase in water pollution as a negative change from the past to the present. Almost everyone viewed the past as pristine. Despite their perceptions about more water pollution, most farmers were optimistic about the future. In contrast, Dumiati farmers expressed a number of reasons why the present was perceived as worse than the past. For example, they perceived the land as being saltier and that there is enough water but it is too polluted. They do not seem to be optimistic about the future.

Gender Analysis

Gender findings are integrated throughout the research report. In terms of gender roles, recent increases in girls' education, access in some places by some households to labor-saving devices and religious factors are some of the major factors of change in rural areas. Girls and boys are receiving equal education. The almost universal availability of potable drinking water, along with the advent of other labor saving devices for women, has meant an extraordinary decrease in work burden for wealthier village women.

Gender norms are changing as well. More educated women may be excluded from work in the fields or their participation in farm work may be reduced. One clear implication of this change is that many women now have more free time to watch television and many have the education to understand the programming.

Communication Channel Findings

By far, television was the preferred channel of communication. Apart from Aswan which has television reception problems, the national television channels were watched most frequently by respondents. Dramas and mini-series, news, farm-related and religious shows were most popular among rural men and women. Men's television watching was largely in the evening after 7:00 p.m.; women watched both day and evening television shows. Another popular viewing time is Friday after the religious prayer shows. Interpersonal communication was the second most popular channel of communication. Radio listening, receiving news or information via their children and/or newspapers were the favored communication channels of many fewer respondents.

Implications and Conclusions

1. The research results suggest that the MPWWR may also need to extend its public relations efforts along with the communication campaign.

2. Farmers should be able to see the Minister as often as possible through mass media.

3. It would be very helpful if the campaign explained the rationale for some of the Ministry's rules and regulations in order to foster trust (e.g. the reasons behind the rice fine).

4. The farmer's role in managing the irrigation system needs to be clarified by MPWWR.

5. MPWWR messages should cite farmers' current water conserving practices and praise them for their conservation efforts.

6. The campaign needs to explain the advantages of changing behavior to farmers.

7. Egypt's water scarcity could be explained to farmers by linking the scarcity to some of its causes: population growth in the future and Egypt's lack of access to water because the source of the Nile is outside of Egypt. Many farmers already seem to be aware of one or both of these factors.

8. Because the High Dam is the way farmers divide the past and present, water scarcity could also be illustrated by the times before the High Dam when water was often scarce.

9. Images of water used in the campaign should emphasize water as the source of life.

10. In the future, more research may be needed into the matter of farmers' individual and group decision-making. Communication campaigns would also benefit from more research on how technical information is communicated among household members and how behavior is changed in response to that information.

11. Television will be the most important medium to reach male and female farmers. Entertaining programs for women that include education on water scarcity and pieces on the news and in agricultural programs to target men, would be useful.

12. Face-to-face communication in the village, e.g., through agricultural cooperative seminars, could also be important to increase the visibility and image of the Ministry.

10. Children are an important communication channel. The school program may be expected to increase parental awareness of water issues.

11. Since the words for *mesqa* vary by location, MPWWR should pretest its campaign materials in at least five different governorates so that the correct irrigation terminology is used.

12. This training and hands-on experience has effectively built WCU capacity and staff enthusiasm for future research activities either by the Unit itself or if they choose to select and supervise an outside research firm. Unfortunately, the severe time constraints did not allow for sufficient time for the WCU time to acquire the ability to design studies or analyze data thoroughly.

Selected Results

There are ten results which can be developed into communication themes (see following section) and communication channel recommendations:

- **Result 1: Communications Channels**. National television stations are by far the most important communication channel and both rural men and women can be reached in the

evening or after the Friday Koranic shows. Women watch much more daytime television.

- **Result 2: Awareness of Limits of Water**. Second, local water shortages matter most to farmers. Men appear more aware of the national water scarcity than women.

- **Result 3: Water Conservation Behaviors**. Many farmers say that they are already practicing multiple methods of water conservation. Most of these methods can result in water being used more efficiently but may not always result in a net water savings in the local or national system. Most women are not able to water at night due to safety concerns and women's role in farm decision-making varies.

- **Result 4: Water Pollution - The Most Frequently Discussed Water Issue**. Waste disposal is a major concern in the villages and the irrigation canals are often the only viable site for waste disposal. Women are quite concerned about the health problems created by pollution and men spoke more often of resulting crop damage.

- **Result 5: Much Farmer Confusion over Farmer and Ministry Responsibilities; Some Farmers Appreciate the Difficulties of the Ministry.** Farmers want more government help with their farms and irrigation and need more clarity about responsibilities and assistance available. This situation is particularly true in Dumiat but in Aswan, there appears to be more clarity and satisfaction with services provided.

- **Result 6: Priority on Self-Sufficiency for Families through Crop Choices.** Households are very concerned with food (women) and income (men) self-sufficiency. Rice is a prized crop because of its food and sale value; the rice fine is seen as unreasonable. Aswanis place greater priority on cash crops than the other two areas where residents stated a preference for a mix of home consumption and marketed crops.

- **Result 7: Water is a Source of Both Conflict and Cooperation.** While watering and use of pumps are usually cooperative endeavors, water-related conflicts arise among men. Water-related conflicts arise among women as a result of waste water disposal and canal pollution.

- **Result 8: Perceptions about Water in the Past, Present and Future.** Most people appreciate that there is more water now than in the time before completion of the Aswan High Dam. In the past, water quality was not an issue but it is a serious concern in the present and for the future, particularly in Dumiat.

- **Result 9: Farmer Flexibility and Adoption of New Behaviors.** In the rural areas, there have been changes over time in the way people live and work as a result of increased educational levels, improved access to irrigation water and new crops, and increased population densities. Sound economic arguments and practical advice is needed to

convince farmers to change their farm and irrigation practices. Particularly in Aswan, women are contributing less farm labor as a result of improved access to education and higher family income resulting from cash crops.

- **Result 10: Local Awareness about Population Growth**. Almost everyone interviewed was aware of increasing population growth and many understand its current and future consequences for water, land and food.

Recommendations

1. Research Methodology

- If the WCU requires further research, it would be best to include an experienced qualitative researcher in the team as advisor and to lead the team in designing the research, analyzing the data, writing the report, and preparing the presentation. It will also be necessary to plan for a longer period for research planning, focus group discussion guide development, analysis during and after research, and report writing in order to enable the staff to participate more fully in these research activities. It would be advisable to include WCU staff in these activities in future research.

- The selection of the three study governorates was based on engineering criteria. However, for a communication study, it would have been advantageous to include communication criteria as well. For example, in Lower Egypt, only Dumiat was sampled. While the Dumiat data suggests that women should be represented in images and messages for Lower Egypt, it would be helpful to have had another Lower Egyptian site to confirm this. If at all possible, future research should be conducted in two other Lower Egyptian governorates to better document women's roles.

- To prevent the possible bias introduced into this research because villages for research were chosen by the Undersecretary for Irrigation, in future studies, it might be best to maintain the criteria for village selection, but choose villages randomly from a map of the study district or governorate.

- It is important to bear in mind that focus group research is a skill that takes time to learn. Great care must be taken during the recruitment of focus group participants to ensure that resources are well-spent.

2. Campaign Recommendations

a) Theme Recommendations

- Theme 1: Reinforce Positive Behaviors related to Water Conservation

- Theme 2: Water Gives Life

- Theme 3: Scarce Water and Population Growth
- Theme 4: Sharing the Nile
- Theme 5: Feeding Your family in the Future
- Theme 6: Remember the Past - Think of the Future

b) Communication Channel Recommendations

- **Priority of Communication Channels**
  TV, Face-to-face, Radio, Kids, Newspapers

- **Recommended National TV Channels & Shows**
  Both women and men can be best reached using national television channels (1, 2, 7 and 5). The best hours are after 7:00 p.m in the evening or after Friday's Quran shows. Women can also be reached during the day. Drama and mini-series (*tamsalayaat*) are very popular with both men and women and news and farm-related shows are also widely watched. Campaign messages with a religious theme may be more effective if timed to follow the Quran shows. Other television spots should be positioned near the dramas and mini-series. News shows should be approached regarding more irrigation-related news. The farm-related drama and/or information shows could also include water scarcity and water conservation behavior themes and messages.

- **Recommended Local TV Channels & Shows**
  Poor reception for most local channels, particularly in Aswan. Channels provided later in the report.

- **Face-to-Face Communication Recommendations**
  Males: agricultural cooperative;
  Females: home-based meetings, Ministry of Social Affairs.

- **Radio Recommendations**
  In general, radio is not a popular medium for most of the rural residents interviewed. For those who do listen, both males and females favored the Quran radio shows. A few men and women listen to news and agriculture shows and there were a few women who listen all day.

- **Kids**
  A few children were said to read papers and tell the news to their mothers

- **Newspapers**
  In most study areas outside of Dumiat, newspapers were not common. In Dumiat, the newspapers mentioned included Gomhuriya, El Akhbar and El Wafd.

- **Images**
  Communication images should illustrate positive behavior rather than negative behavior. Whenever possible, women's involvement in farms (decision-making, field work, crop processing or marketing) should be shown. The images of water which are used can be drawn from those provided by farmers, including the human-like attributes ascribed to water. If new practices are going to be promoted, then the multiple benefits - economic, health, civic pride, religious, etc. - should be communicated.

- **Priority Language**
  Since there are variations by region and sometimes by gender, the communication campaign should tailor regional spots by using local words for canals.

Introduction

Do Egypt's farmer's know that Egypt is facing a serious water shortage in the near future? Are these farmers currently practicing water conservation behaviors, and if so, what motivates them to adopt these practices? This information and more was needed by the Water Communication Unit of Egypt's Ministry of Public Works and Water Resources (MPWWR) to support their first multi-media mass communication campaign.

With financial and technical support from USAID/Egypt and the USAID-funded Environmental Education and Communication (GreenCOM) Project, a team from the Water Communications Unit (WCU) received research training and collected qualitative data in rural Egypt. The training and field research was supervised by two senior social scientist consultants provided by the GreenCOM Project (Drs. Laurie Krieger and Laila Hammad El Shennawy); the study design and on-going technical support was provided by Washington, D.C.-based GreenCOM research advisors, Drs. Nancy Diamond and Orlando Hernandez. Dr. Krieger holds overall responsibility for the final report; the final briefing presentation was a collaborative effort of the WCU team and Drs. Diamond, Krieger and El Shennawy. In addition to the Water Communications team (Mr.Hammad Ahmed Hammad, Mr.Ahmed Naged Awise, Ms. Eman Mohammad Abdou, Mr. Diaa Mohamed Nour El Dine, Engineer Hisham Saber Shehab) which conducted research at all three sites, two other people participated in some of the research sites (Dr. Soheir Louis, Engineer Dina Mamdouh Mohammed).

In all, the group conducted a remarkable total of twenty focus groups (ten for men and ten for women) and nineteen in-depth interviews with key informants over a twelve-day period in August and September, 1996. A total of one hundred and sixty eight people were interviewed. A total of one hundred and sixty eight people were interviewed. The team traveled in the Egyptian summer heat to three governorates - El Fayoum, Aswan and Dumiat. They analyzed the data as they worked in order to have themes immediately ready for the September-October communication campaign. At this juncture, the research team will don their communication "hats" and the communication campaign will greatly benefit from their "hands-on" experience with their audience. Rather than being passive clients of a research firm, this activity has effectively built WCU capacity and staff enthusiasm for future research.

METHODOLOGY

Site Selection

The MPWWR chose the three governorates for this study. From an engineering standpoint, these places exemplify three different irrigation conditions. The Fayoum is at the end of a canal system and is not expected to experience water shortages. Aswan, at the beginning of the irrigation system and bordering on the High Dam's Lake Nasser, should also have a sufficient amount of clean irrigation water. However, parts of Aswan are located at higher elevations and such land would be expected to be a greater irrigation challenge. Dumiat is at the end of the Nile and Egypt's irrigation system. It was expected that Dumiat farms would have poorer drainage, salt water seepage and a greater incidence of polluted agricultural water.

The Undersecretary in each governorate chose the research villages. The Ministry team leader, Mr. Hammad Ahmed Hammad, WCU Research Specialist, traveled to the sites before the rest of the team. He worked with the district irrigation engineers to set up appointments for interviews and arrange for focus groups. The criteria for selecting the village were:

1. The great majority of villagers derive their livelihood from farming;
2. The villages in the governorate be located at varying distances from the main town;
3. The village mayor, Sheikh El Balad, or head of the cooperative be willing to participate in the study; and
4. Whenever possible, local women were involved in farming.

With one exception, a different village was selected for each day and two focus groups (one with men and one with women) were held in each village. Individual in-depth interviews were distributed among the villages (see Appendix C for distribution of focus group discussions and in-depth interviews).

Sample Size

The study design originally called for an equal number of male and female farmer focus groups to be held in each governorate. Each focus group was to have been homogenous for age (less than 40 years old and greater than or equal to 40 years old) and the location of the farm along the *mesqa*. In addition, wherever possible, the people in the male and female groups were to have been spouses so that concurrence in decision-making could be assessed. It was felt that people would be more comfortable speaking with people their own age than with people much younger or older than themselves. And because age and educational level are closely linked, it was thought that the two age groups would also represent different educational levels (particularly for women). A final criterion was that everyone work as a farmer, unless it was an area where women do not work on the land.

The group criteria soon proved to be quite difficult to implement. Most of the research topics were not personally sensitive like topics such as family planning. People of the same educational level seemed to feel most comfortable talking together, no matter what were their ages. In groups where older women (as was usually the case) were illiterate and younger women were literate, the older women often were silent in the presence of their more knowledgeable juniors.

Furthermore, farmers own or rent plots of land at various points on the *mesqa* and some farmers neither own nor rent, but work as landless farm laborers. Relatively few focus group participants could be grouped homogeneously as "end of *mesqa*", “middle of the *mesqa*” or "beginning of *mesqa*." This multiple plot strategy was more than likely used by farmers to offset risk from crop failure on any one plot (due to water scarcity or other reasons). Multiple plots may increase overall water consumption for any given farmer and water conserving behavior may vary by plot. So for the purposes of this study, we could not use farmer plot location along the *mesqa* as a reliable predictor of farmer’s water conservation behavior.

Villagers who were able to participate in focus groups were those who were free at the time the group was held. Although the team held focus groups at times when farmers are usually home from the fields, it proved very difficult to obtain married couples for the focus groups. The team able to include the spouses of the focus group participants in the other focus group in only two situations. The team was able to apply the criterion that all participants be farmers or members of farmers' households. All focus group participants met this criterion. Some focus group participants were chosen by the Omda or Sheikh El Balad, while others were gathered more or less randomly by members of the team walking through the village. Surprisingly, the two methods of recruiting participants did not yield different focus group findings. It is possible that the Omda or Sheikh El Balad rounded up anyone living in the vicinity who was available at the time of the focus group.

Focus Group Discussions

Focus group discussions are a form of qualitative in-depth group interviews. Focus groups are facilitated by a moderator and recorded by a notetaker. They are usually audiotaped as well. The team used audio recording to supplement the notetaker's notes. Focus groups usually include from six to twelve people and last an average of one and one-half to two hours. Focus groups explore only one or at most two topics, but are designed to explore the topics in some depth. The focus group moderator uses a guide, prepared in advance, to stimulate discussion. The moderator elicits comments on every aspect of the subject from as many of the participants as possible. However, the discussion should resemble a conversation rather than a question and answer session. Before the training began, Drs. Laila Hammad El-Shennaway, GreenCOM Gender Consultant, and Laurie Krieger, GreenCOM consultant to The Academy for Educational Development, assisted by Mr. Hammad Ahmed Hammad, prepared the focus group discussion guide (please see Appendix for English version of focus group discussion guide).

Questions pertaining only to female focus group participants were included in the guide for the purpose of gender analysis.

Twenty focus groups were held: half with all-male participants and half with all-female participants. In all cases, the moderator was the same gender as the participants. In one case, the notetaker of a male group was a female member of the team, otherwise, notetakers were also the same gender as the participants. Six focus groups were held in El Fayoum, eight in Aswan, and six in Dumiat. In addition, two practice focus groups (one with males and one with females) were held in Qalyubiya to pretest the focus group discussion guides and provide MPWWR team members with hands-on training before actual research began. The results of the two practice groups are not included in this report. A total of 83 men and 85 women were interviewed through focus group discussions (see Appendix 3 for distribution by village and governorate).

Focus groups lasted from one to three hours, with most taking about one and one-half hours. Moderators and notetakers were rotated so that each member of the research team had the opportunity to serve at least twice as a moderator and notetaker. One of the two consultant senior social scientists, Dr. El Shennawy or Dr. Krieger, observed each focus group discussion and intervened through sending a written note to the moderator if (s)he seemed to be in trouble or was ignoring an important area of exploration.

Individual In-Depth Interviews

Individual in-depth interviews are another qualitative research technique. Different semi-structured individual in-depth interview guides were prepared for the following categories (see Appendix F for the English version of the interview guides. The individual in-depth interviews provided a point of comparison with farmers' views and served as a cross-check for farmers' perceptions of the water situation and MPWWR, just as the farmers' perceptions served as a cross-check for the individual interview respondents' viewpoints.

Nineteen individual in-depth interviews were held (see Appendix C for distribution by category and governorate).

Irrigation engineer
Bahar(i) (MPWWR village worker)
Agricultural engineer
Omda (mayor)
Sheikh el Balad
Sheikh of the mosque
School Master/Mistress
Female teacher
Female outreach worker, Ministry of Social Affairs

The *bahari* interview was added in the last site, Dumiat, after it became clear, in Aswan, that this MPWWR employee might play a significant role in villagers' perceptions of the MPWWR.

Role of Training

Focus group discussions and individual in-depth interviews are two techniques widely used in communication research. Training WCU staff members in these two important techniques will help to serve future research needs of the Unit, whether the WCU chooses to select and supervise an outside firm or to conduct the research themselves.

Two days of training (August 14 and 15) were held in the MPWWR. The training covered the following skills (see Appendix B).

- qualitative vs quantitative research
- qualitative research (types)
- purposes of qualitative research
- research ethics
- bias in research
- sampling
- communication skills
- overview of participatory rural appraisal
- types of interviews
- focus group discussions
- overview of gender analysis
- individual in-depth interviews

The team spent August 17 conducting two practice focus groups and a few in-depth interviews in Qalyubiya governorate. In addition to providing the team with hands-on practical experience, the purpose of the Qalyubiya research was to pretest the focus group discussion guide and interview schedules. One or two minor changes were made to the guide after this experience.

On August 18, the team concluded its training with review of the field experience and the introduction of the topics of

- data analysis
- planning, implementing, and using qualitative research in communication programs

The entire research project was a valuable learning experience for the WCU staff. The team's skills are now much better developed. However, the severe time constraints did not allow for sufficient time to acquire the ability to design studies or analyze data thoroughly. Furthermore, although team members acquired considerable skill in focus group methodology, they are still learning.

Recommendation: If the WCU requires further research, it would be best to include an experienced qualitative researcher in the team as advisor and to lead the team in designing the research, analyzing the data, writing the report, and preparing the presentation. It will also be necessary to plan for a longer period for research planning, focus group discussion guide development, analysis during and after research, and report writing in order to enable the staff to participate more fully in these research activities. Research planning, instrument development, and data analysis require a great deal of skill and practice; it would be advisable to include WCU staff in these activities in future research.

Data Analysis

After the focus group discussions each day, Dr. Krieger reviewed the day's focus group notes. Together with the notetaker and moderator (often with the collaboration of Dr. Laila), they made an English translation/summary of the notes. In the evening, the team gathered to discuss the day's research and go over the research process. All listened to the day's two notetakers read their notes. After each focus group's notes were read, the entire team discussed and decided upon the themes that arose in each focus group. As the research progressed, the team was able to compare the themes among different groups and different sites. After the team meeting, Dr. Krieger filled in the themes with the appropriate quotes from the focus groups.

This process was followed most fully in the last site. The team commuted to the first site, two villages in El Fayoum. Travel time and pressing administrative matters meant that the team did not leave for the field until late morning and completed field work each day in late afternoon or, in the case of Kafour El Nil, in the late evening. There was, therefore, insufficient time each day for a thorough review and analysis. In Aswan, after fieldwork each day the notetaker and moderator of each focus group reviewed the focus group notes with the consultants and collaborated on the translation. In Dumiat, the group spent a long day reviewing all the in-depth interview data and summarizing, analyzing, and writing a descriptive report about them (see Appendix G). During the few days between field work sites, the team gathered in the MPWWR to review the research process and discuss themes that emerged from the research.

When the team arrived back from the final site, Dumiat, they spent two days reviewing the coded English field notes. They discussed the themes, appropriate communication channels, campaign themes and messages suggested by the research.

Problems Encountered in the Research

The selection of the three study governorates was based on engineering criteria. However, for a communication study, it would have been advantageous to include communication criteria as well. For example, in Lower Egypt, only Dumiat was sampled. However, women's role in agriculture, and probably in irrigation, in Lower Egypt is generally greater than their role in Upper Egypt. In one of the three sites, Aswan, many women did not work in agriculture. While the Dumiat data suggests that women should be represented in images and messages for Lower

Egypt, it would be helpful to have had another Lower Egyptian site. Recommendation: If at all possible, future research should be conducted in two other Lower Egyptian governorates to answer this question.

Another site selection problem was the possible bias introduced into the research because villages for research were chosen by the Undersecretary for Irrigation. It is impossible to assess the representativeness of the sample. Recommendation: In future studies, it might be best to maintain the criteria for village selection, but choose villages randomly from a map of the study district or governorate.

It is important to bear in mind that focus group research is a skill that takes time to learn. The team's expertise as both moderators and notetakers grew rapidly over the course of the study. However, in earlier focus group discussions moderators and notetakers made many of the standard errors made by those learning the skills of conducting focus group discussions (e.g., asking leading questions, asking questions that limit how much information the participants feel they may give, inserting the moderator's own opinion rather than eliciting those of the participants). Therefore, in some cases information from earlier focus group discussions may have less depth than information from later focus group discussions. Recommendation: Great care must be taken during the recruitment of focus group participants to ensure that resources are well-spent.

The data from one of the focus groups with women in Aswan was discarded when it was discovered that the participants were close relatives (mother-daughters, sisters, aunt-niece). When data from this focus group were compared with those from other focus groups held in Aswan, the data were very different, indicating that there had been bias.

WATER-RELATED FINDINGS

Each village faces a unique set of circumstances and reacts differently. While one village expresses gratitude to the government for supplying ample water, a village in a neighboring district complains of polluted and insufficient water. Still, there are similarities in experience between villages in a governorate and even among El Fayoum, Aswan, and Dumiat governorates. This section presents focus group findings that cut across all three governorates, but also includes findings specific to focus groups in the each governorate. The team collected a wealth of data. The findings presented here are those likely to be most useful for the MPWWR communication campaign on water scarcity. Whenever possible, they are presented in a way that might also make sense to the rural people (*fellahin*) because it is they who will be the audience for the campaign.

Water Scarcity

Our question about water scarcity, "What would you say if someone told you there was a scarcity of water in Egypt?" elicited a range of responses. In almost every male focus group, at least one farmer would angrily respond, "I'd say he was a liar!"

Mass media play a role in transmitting information about water scarcity. In a male focus group, one participant responded, "We listen to the news and we hear that the Nile has increased from Lake Nasser and the dam is 10 centimeters higher than last year."

However, there were three other ways of thinking about the subject. A few focus group participants (mostly male but also a few female) connected population growth to water scarcity. These farmers clearly understood water as a limited resource. "There were 15 million people in Egypt and now there are 60 million. ... There were three in my father's house. Now there are 15." "We're afraid water will decrease because the government says the population is two much," said an Aswani man with 12 children. All focus group participants who linked population and water scarcity also said they watched a great deal of television.

However, many other avid television watchers did not mention a link between water scarcity and population growth. Other farmers from all three governorates connected their local situation to the rest of Egypt, "If there were a scarcity of water in Egypt, we would all die." "Whatever happens to Egypt happens to us."

A smaller group, who had experience as labor migrants in the Gulf, compared Egypt's situation to the Gulf States and found the concept of water scarcity in Egypt completely unbelievable. "I was in Saudi Arabia. Egypt is good. [with respect to water]"

Concept of Egypt's Irrigation System

Everyone, except possibly two or three illiterate women from El Fayoum, was well aware that the Nile is the source of Egypt's water for irrigation. However, not everyone knew or cared about the source of the Nile. One woman, responded with sarcasm and surprise to the question about where the Nile comes from, "Do I know?" A man answered: "I don't know where the canal comes from."

In at least two focus group discussions, the moderator never asked the group about the source of the Nile. In the remaining focus groups the most popular response about the source of the Nile was "Ethiopia," followed closely by "I don't know." The next most mentioned source was the High Dam. Sudan was the next most frequently cited source, followed by responses indicating the person did not care about the source. Four additional respondents cited sources outside Egypt.

Educated focus group participants were only slightly more likely than illiterate participants to cite a source outside Egypt. However, illiterate participants were more likely not to answer the question at all. These responses indicate that of those who did offer an answer in the focus groups, the overwhelming majority were aware that the Nile originates outside of Egypt in Africa.

The Nile was most commonly referred to in all areas as the *bahr*. In the one group in which the moderator asked a question about Egypt's water treaty, most men were perplexed, although this was a literate group that read newspapers. Two of the participants had heard something about the treaty, but were vague about what it meant.

Rural people know that the Nile provides water to their canal. The canal is large and has doors or gates that determine how much water people receive. Rural people know that control of these gates is the responsibility of the MPWWR and they also know that the MPWWR is responsible for cleaning and maintaining the canal. Failure to maintain adequate pitching or to rid the canal of grass, water lilies, and sewage sludge was a complaint among most farmers. Irrigation engineers acknowledged their responsibility to maintain canals but, in one case, expressed frustration that the equipment was not adequate to the task. Farmers refer to the canal as "*qanal*" in Dumiat and as "*tiraa*" in the other two governorates.

According to the MPWWR, the most common irrigation arrangement is a main canal (referred to by engineers as "*rayah")* which feeds a branch canal which in turn, feeds secondary canals which are individually called "*mesqa*." However, the team found that almost no one used the term, "*mesqa"* to refer to these secondary canals. The word, "*bahr"* was most commonly used but there were several others (see Appendix 7 for a diagram of a typical irrigation system in the study area with commonly used terms). Most farmers said that the *mesqa* is private and that maintenance of the *mesqa* is their responsibility. "We clean out the *bahr* everyday." "Whenever anyone irrigates, he tries to clean the *bahr* during his time [of irrigation]." However, in about 20

percent of focus groups, farmers felt that the Ministry should clean the *mesqa* ("do you want us to go into the *mesqa* to clean it out?!"). From the *mesqa*, farmers (male or, in some places, female) direct the water into the irrigation ditches that run through the farmer's land. The research team observed that these ditches were far better maintained than almost any *mesqa*.

Irrigation Management

In the view of farmers, the entire irrigation system is managed by the Ministry of Irrigation (in actuality, the Ministry of Public Works and Water Resources - MPWWR). Farmers conceive of the Ministry of Irrigation (MPWWR) as an agency headed by a Minister, whom they hope to influence in order to get more water or cleaner water. Farmers do not understand Ministry decisions or the reasons behind irrigation laws and may strenuously object to some of these laws and regulations, e.g., the fine on rice growing. We heard "the water is not the problem...the fine is the problem."

Farmers are usually not acquainted with the District Irrigation Engineer. No women and only a very few men knew the name of their District Irrigation Engineer. The *Bahari* was known variously as the *Bahar* or *Bahara.* Except in parts of Aswan, the farmers in the focus groups generally did not speak positively of this MPWWR employee and often were not acquainted with him.

For example, in one focus group, a question about the *Bahari* elicited these responses from women: Woman A: "No one has heard of the *Bahara*." Woman B: "There is no *Bahar*." Woman C: "What's a *Bahar*?" Woman D: "He [the *Bahari*] takes a little rice from everyone." Woman E: "Whatever happens, he says, 'It's not in my hands.'"

Farmers attempt to influence the MPWWR through complaints. Their methods are ingenious. Some of the methods cited include:

- complaining to the local council which brings the complaint to the district and governorate levels;
- writing a letter to the District Irrigation Engineer
- writing a letter to the Undersecretary of Irrigation
- sending telegrams to officials at the governorate level and central level
- writing to the Minister of MPWWR
- appealing to their Member of Parliament
- Writing to the Prime Minister

Many farmers expressed frustration regarding their attempts to resolve their water and canal issues. One farmer said "I have been running after the Ministry for four years!" Others said, "We have been complaining [about the absence of a promised larger pump] for twenty years." In one village in Dumiat, both women and men said they participate fully in farming and members of both focus groups were angry and desperate to receive a long-promised larger pump to get water into

their *mesqa* from the canal. When the team was about to leave in their vehicle, they were surrounded by village children who staged an impromptu demonstration, shouting, "Give us a pump!" and "We want water!" Farmers in almost every focus group in every site mentioned making a complaint about water. In Aswan, for example, farmers complained about the pitching of the irrigation system.

Farmer's Role in Irrigation

Disputes occur among farm households over water. Farmers say they are given irrigation appointments by the MPWWR (through the agricultural cooperative) and "Everyone knows his time." However, disputes may occur when people water out of turn or borrow a pump and do not return it in time. In one focus group in El Fayoum, a man complained bitterly about the families living along one area of a *mesqa* who had "broken the *bahr* and it's not their right!" [they had watered out of turn]. Said one woman in Dumiat, "The men argue about water." Women's water disputes seemed to be mainly about disposal of waste water. "If I throw the water in front of my house, the neighbors get angry, so I throw it in the *bahr*."

Often, villagers view the MPWWR as both policeman and judge in water disputes (a view that one of the District Irrigation Engineers echoed). Said one male farmer, "People who farm, talk. They say we need to see who broke the [irrigation] appointment and see if they are taking our quota of water. We are talking about it with the irrigation engineer." Another man said, "We'll inform the Ministry [about neighbors watering out of turn] and we'll take our quota from the Ministry."

People also cooperate around water. The agricultural engineers told the researchers that there is a law which specifies that *mesqa* maintenance and cleaning is the responsibility of the agricultural cooperative. Farmers in about 80 percent of the focus groups said that they clean out the *mesqa*s themselves. "Fifty or 70 men get together and dig out/clean the *mesqa*." In one village, the team arrived in the morning and had to squeeze their vehicle past a donkey cart loaded with water lilies. Women in this village spontaneously said that villagers clean out the *mesqa* daily. Farmers may join together to contribute money to rent a *karaka* (backhoe) to clean out the *mesqa*. Some said the *mesqa* was "private" and contrasted this to the canal, which belongs to the Ministry.

Decision-making about what crops to grow is usually done jointly with neighbors in order to ensure that everyone gets enough water. "We try to group together to grow the same things." "If I think of growing something different than my neighbors, I consider his opinion." One woman said she planted the same things as her neighbors "So my children don't take things from my neighbor's fields." Upon further discussion, it became clear that the primary concern in planting the same crops was to ensure that everyone got the same amount of water. Farmers also recognized that each crop needs a certain amount of water and no more (see section on Water Saving Behavior). If a farmer has more water than (s)he feels the crop needs, (s)he will give his/her watering time to a neighbor.

In El Fayoum and Aswan, some farmers use pumps (*mekana*) while others use no pumps. Farmers at the end of the *mesqa*, particularly in Dumiat, say that they have no water because there are "500 pumps ahead of us." All the farmers in the Dumiat focus groups reported using pumps to enable them to irrigate. These farmers attribute part of their shortage of water to other farmers' pump use rather than to the Ministry.

Farmers who experience water shortages also blame the dirty *mesqa* and dirty canal for not allowing water to pass. Farmers throughout Egypt (even in Aswan, although less so) are very concerned about pollution and connect this with insufficient water, both as a cause and a result. The lack of flooding since the High Dam has allowed pollution to build up and this solid waste clogs the irrigation canals and *mesqa*s.

Pollution

Pollution seems to be a problem that is constantly on the minds of farmers in the focus groups. The focus group discussion guide contains questions about pollution, but moderators seldom reached these questions before participants had already raised the issue of pollution. Even in Aswan, where the Nile is relatively clean and unpolluted, pollution bothered farmers. "The foreigners are the reason the Nile is polluted because they use the tour boats."

The contaminant mentioned most often in relation to pollution in the *mesqa* and canals was dead animals. These things had been thrown in by rural people. People seemed most offended by dead donkeys(see below: Water). In the great majority of women's groups, this was the first instance of pollution mentioned. Men also mentioned dead donkeys. Other very frequently mentioned sources of pollution are sewage and nightsoil from septic tanks. In addition, many villagers mentioned household waste water, factory sewage, and waste from Ministry of Health clinics and hospitals. Farmers complain that there is nowhere else to throw garbage and sewage other than the *mesqa*. In one focus group, women complained that they paid a monthly fee to the local council to cart away their garbage, "...but the truck never comes." Both women and men acknowledge that women are doing the majority of the dumping in canals, *mesqa*s, and drainage ditches, but, "What can we do?" Participants feel that they have no alternate spot to dump refuse. One woman complained that if she threw her waste water in front of her house, her neighbors would complain.

Dumiat farmers are located at the end of Egypt's irrigation and drainage systems and their water is often more polluted. They expressed feelings of desperation related to the declines of their health and those of their families and reduced crop yields. "We want the water cleaned because our husbands are dying." "Our children are falling ill and being born sick because of the [polluted] water." Although Dumiatis blame the rest of Egypt for their plight, they also blame themselves. "In the past, whoever wanted to get rid of their sewage dug a hole in the ground. Now they throw it in the canal." "The sewage truck belongs to the local council. It gathers the nightsoil and throws it in the canal." "The truck [also] throws it in the drainage ditch which leads into the lake. The lake should have fish, but they're all dead." The land itself is polluted, they

believe, because of the polluted water. "In the past, we walked on the land and smelled mud and the smell was good. Now it smells bad ... "

Water Shortage

Members of the research team always introduced themselves as coming from the Ministry of Public Works and Water Resources. In the focus groups, farmers were usually first to introduce the subject of water shortages. They had intense feelings about the amount of water available and sometimes. These feelings were deeply felt and sometimes the focus group participants directed their negative feelings at the moderators and notetakers from the Ministry.

Each village has its own factors producing water shortages. In general, however, those at the end of a *mesqa*, even in Aswan, suffer water shortages: "In the beginning of the *mesqa* they complain of too much water. At the end of the *mesqa* they don't have enough water." Focus group participants in some villages in Aswan say they do not have a problem with the quantity of water. However, in other villages participants complained of water shortages, "Water is important and it only comes every 22 days. What can we do?"

In El Fayoum, water shortages are remembered from the times before the High Dam, but in one village farmers mentioned a chronic problem with water shortages at the present time. A woman insisted that there are water shortages right now, "The land is more now, so the water isn't enough." At first, all the participants in her focus group disagreed with her. Everyone else said that there was adequate water. However, by the end of the discussion, the entire group had shifted to endorse the woman's position and others volunteered that villagers had complained due to the lack of water. One focus group is unfortunately not adequate to determine the situation in this village. However, the men's focus group discussion, while acknowledging the role of the MPWWR in providing water, indicated that the water was still insufficient for their needs. "We thank the Ministry and need more water."

Dumiati farmers expressed the most complaints about water shortages. "In the summer, [water is supposed to be scheduled for] five days on and five days off. But [the water] only comes for one or one-and-one-half days." "There is no water. There is no production." They attribute their plight to the MPWWR and expect the "government" to do something to help them. "We want the government to come and see why there isn't any water." "Those who have water pay the same taxes as we do who have no water." They are clear in their minds about the reasons for the water shortage, but the reasons vary by village. In one village focus groups participants attributed the lack of water to the inadequacy of the small pump they were provided by the MPWWR to pump the water into their *mesqa*, as well as the inaccuracy of the level provided to them by the irrigation engineer. In addition, they said that they were at the end of a long canal and there were 500 pumps working the canal before it got to their village.

In one Dumiati village, focus group participants claimed that farmers occasionally have to water their crops with "water from the faucet." In another context in the discussion, a woman

from this village said that she had once had a water bill (monthly or bimonthly) of LE 115 (approximately $34 US Dollars). Although they must pay a great deal of money for using tap water to irrigate, farmers regard this as more cost effective than letting their crops wither in the fields. Perhaps for this reason, this was the only village in which people complained of shortages of drinking water. "[Only] at one o'clock in the morning do you find drinking water."

While complaining of a shortage of agricultural water, Dumiatis suffer from a surplus of drainage water. They would like help with this problem as well, "Before the water comes it should be lessened." "We want a drainage project!" These comments come from two different villages in Dumiat.

Water-Saving Practices

Farmers engage in a variety of practices that result in saving water. Most of these behaviors involve the more efficient use of water. In some cases, farmers are able to reduce their net requirement for water and for others, these behaviors allow the farmers to redistribute their water allocation in a new way and has not resulted in a net savings of water. For this study, the term, “water conservation behaviors” has been used to describe a number of behaviors related to use of irrigation water. These behaviors include old behaviors which the farmers have always practiced and some new behaviors.

Saving water was not always the explanation given by farmers for why certain practices were adopted and maintained. Virtually all farmers in groups in all three governorates said they watered at night. A relatively small minority of farmers said that they watered both day and night or "whenever their [irrigation] appointment came." "In the beginning of the *mesqa*, you water anytime. At the end, you water at night and people have land at both ends," a man from Aswan said. However, in El Fayoum, a man said that people at the end of the *mesqa* were more likely to water day and night in order to maximize their chances of getting enough water. "Everyone waters at night because the earth takes more water," said a woman in Aswan. A Fayoumi man explained why everyone irrigates by night, "Irrigation by night is best for the crops." In another focus group in El Fayoum a man elaborated, "Watering at night is better because the ground is cooled and it takes water right away." Several women in focus groups in El Fayoum and Dumiat expressed the same idea.

The identity of the person who irrigates by night is determined by region and gender. In El Fayoum, focus group participants said that women could not irrigate at night because they could not go out at night. However, two women from Dumiat in two different focus groups volunteered, before being asked, about watering at night, "We're up all night irrigating from years ago [i.e., the practice is old in this village]." "I'm up all night irrigating."

Everyone said that they leveled the land. In many villages, the cooperative rents a laser level every year or two and farmers contribute to its rental. The level is used on everyone's land in the village. Participants from just one village say they did not level their land. Although they

recognized the value of leveling, they asserted that it was too expensive. Elsewhere, farmers seemed to consider leveling to be a normal part of farming. "You have to level the land, it's the way in farming." "You have to level the land. Also crops have to receive water equally."

Farmers engage in other practices which they believe will save water. This may be true even when farmers do not perceive they have a serious water shortage. Two participants in a men's group in Aswan said, "Everyone should finish irrigating quickly to give water to their neighbor."

Farmers' behavior is characterized by flexibility and hard-headed practicality. Farmers recognize that crops have different requirements for water and if they receive too much water for their crop's requirement, they share their watering time with a neighbor who needs more water. In addition, amount of water available is a major factor in deciding which crops to grow. "I grow sweet potatoes because I do not have much water," said a woman in Dumiat. This is true even, as some complained in this women's focus group, potatoes and sweet potatoes are a lot of work and do not give a good financial return. "Sweet potatoes and potatoes are little crops. They do not produce like rice."

When asked to identify crops that require little water, people in most groups mentioned sesame. Sunflowers were also mentioned. "Winter crops don't take much water, but rice takes a lot," said one man. An Aswani woman commented, "Women like to grow peppers, local greens (*moulikhiya*), okra, tomatoes--they don't take much water." However, it was unclear in this context whether the woman actually believed the crops take much water or whether she was taking pains to justify her attraction to growing food for the household.

Crops

In choosing which crops to plant, farmers take several factors into consideration:

- Amount of land available (one group claimed that the cooperative decided what they could plant in plots of a feddan or more) (one feddan = 4200 square meters)
- Amount of water available
- Type of soil
- Probable income
- Amount of work required to grow the crop
- Crop previously grown on the land
- Season
- Household needs
- Logistics of marketing

Farmers, as mentioned above, are well aware of the water requirements of various crops and plant according to the water they anticipate having. For example, in Dumiat where water is not plentiful, a woman said longingly, "If I had enough water, I'd grow part rice and part cotton."

Many farmers said that, "The land decides what you can grow." In salty soil, people in El Fayoum and Dumiat explained, you have to grow rice. Rice and clover (*bersim*) are widely believed to replenish the soil. "Rice improves the earth." "Rice makes the earth like a young girl." "After rice the land becomes better and better." Poor and sandy soil, many farmers said, is suited mainly to sesame.

Income is a major factor in deciding what crop to grow. Rice, cotton, and sugar cane are big money-making crops. "There is no money better than sugar cane," said a man in Aswan. One of the additional attractions of sugar cane, men in Aswan commented, was that it does not take much work. However, other Aswanis envied farmers who plant cotton, which they felt was more lucrative than sugar cane. "I want to grow cotton. Cotton gives more money than sugar cane. The problem is the cooperative doesn't agree." Some farmers indicated that rice produces a large yield per feddan. A man in Dumiat said, "I have something good. I have 1 1/2 feddans and I produce about 20 tons of rice. The feddan produces a lot." Several woman in El Fayoum observed that, "Rice gives more profit per feddan than any other crop." Fayoumi women in another focus group would disagree, "wheat and cotton are the most lucrative crops."

Farmers rotate their crops. Rice was widely viewed as the summer alternative to clover because both crops improve the land. Focus group participants said that some crops are particularly hard on the soil. For example, one male Aswani commented, "If you grow sugar cane, the land becomes tired." A man in El Fayoum observed that, "Corn ruins the earth."

Many women mentioned that, because they live on the land and are rural people, it is important to meet their household food requirements through their household's farming efforts. The women's need for food self-sufficiency came through very strongly, especially in El Fayoum, although it was apparent in all three sites. "We grow wheat because our children eat it." Men in one focus group in El Fayoum said, "Women grow a little pepper, local vegetable (*moulikhiya*), and the needs of the house." Many of the crops that Fayoumi women said they grew could also be used for household consumption, "We grow wheat, pepper, cotton, corn, milo, and potatoes." "We in the village grow zucchini, pepper, cucumber, wheat, corn, and melon." Both women and men were angry about the rice fine. Many said they paid the fine and planted enough rice for the year for their families, rather than buy rice from the store or from their neighbors. "Don't Egyptians eat rice? Don't you in Cairo eat rice? We also want to eat rice." Women in Dumiat and El Fayoum commented that rice was expensive, LE 1 1/2 per kilo. Said one Dumiati woman, "I eat that much in one meal."

Marketing is another factor in deciding which crops to plant. Both sesame and sunflowers require little water and their planting is encouraged by cooperatives in El Fayoum. However, they have very different implications for the farmer, based partly on marketing. Sunflowers are purchased by the oil processing factory. If the factory does not take the sunflowers, the farmer loses the crop. (S)he has no other way of selling the it. Sesame can be sold by the rural women and farmers are not dependent on one purchasing source. However, sesame is believed to spoil quickly. "People are afraid that sesame spoils quickly," said a man in El Fayoum. Nevertheless,

some Fayoumi farmers who would rather be growing rice have switched to sesame and sunflower because that is what the cooperative has told them to do and they do not wish to pay the rice fine.

In a village very close to a sugar cane processing factory in Aswan, male focus group participants said they planted 80-90 percent sugar cane and were secure that the entire crop would be processed in good time. However, in another village visited by the team, farmers planted a much more diversified crop so they did not rely heavily on sugar cane. The village was much farther from the sugar processing factory. Village women complained, "The factory picks up the sugar cane late and then it dries out and the sugar goes."

In addition to these factors, most farmers (see Irrigation section) tend to consult their neighbors about what to grow, and they plant the same things as their neighbors. Although the laws have been liberalized in the past two years and agricultural cooperatives in most cases may no longer specify what crops farmers must plant, in practice this may not be working out. A large number of farmers said that it is the cooperative that decides what they will grow. "The [agricultural engineer from the cooperative] says, 'Don't grow this here. Don't grow this here. Grow this here.'" "The decision of what to grow is the agricultural cooperative's."

Farmers demonstrate a great deal of flexibility in addition to practicality. Farmers in El Fayoum are all planting less rice than they would like. Most seem to be planting only enough for household self-sufficiency and paying the fine rather than go to the store to buy their family's rice needs. These farmers have changed to other crops. Some Aswani farmers who have never planted cotton are willing to change if they can make more money. One of the focus group moderators asked a group in Aswan if they would consider switching from sugar cane to sugar beets and received this reply, "I don't know. I haven't seen it. But I'm willing to learn. If it is good, someone shows it to us, then we'll grow it." Study data suggest that by "good," the farmer probably means suitable to his soil, yielding a high profit, and requiring a reasonable ratio of labor to profit.

Meanings of Water

Water brings life to plants, animals, and humans. It a gift from God to the world. "The irrigation water is good. It is water from God." In the past, water brought health not only to people, but to the land. "The earth was good and kind. Now the earth is sick [from the water]." "In the past we used to drink from the Nile and we never needed a doctor." Drinking water should be pure, giving life and health.

Yet, in Aswan, El Fayoum, and Dumiat, villagers told the researchers that agricultural water was contaminated by foreign objects. Although the team noticed that solid waste such as plastic items and food remains were present in some irrigation and drainage waterways, no one mentioned these as sources of pollution. Nightsoil and sewage were mentioned frequently as well. In both Upper and Lower Egypt, a few people mentioned bloodied waste materials from clinics and hospitals. However, farmers in Aswan and Dumiat mentioned factory waste.

One of the most frequently cited examples of pollution in the *mesqa* and canals was dead animals, especially "dead donkeys." "Dead dogs" were also mentioned by a few farmers and one person mentioned "dead chickens." In one village in Dumiat, women reported finding worms and "donkey hair" in the drinking water. "For the past 10 years we have found donkey's hair [in the drinking water from the faucet]. A man cuts donkey's hair by the canal and it comes in the drinking water." Most of the items cited by farmers as causing pollution - donkeys, dogs, human excrement and blood - are physically polluting and represent negative symbols for many Egyptians. For example, donkeys are not a respected animal in Egypt and their carcasses would not be respected.

The focus group participants often contrasted the natural and pure state of life-giving water to the death and disease-causing polluted water. The Dumiat focus groups most commonly described their water situation using this symbolic language but we heard this imagery from farmers in the other two governorates. This information, both the symbols and language used to talk about water pollution and contamination, may be important to use in communication campaigns(see Implications).

Past, Present, Future

Almost all people in all three governorates divided time with respect to water into two periods. The period before construction of the High Dam they referred to as the past (*zamaan)*. The time since the construction of the High Dam forms the present.

With respect to water, people compared water quantity and water quality in the past and the present. In all three study areas, most of the people interviewed said that water is now more plentiful than in the past. They were grateful to the MPWWR for the improved and regular water supply resulting from the construction of the High Dam. As a result of more water, some farmers are now:

- Choosing to grow crops, such as rice, which require more water... "Now I grow rice. I couldn't before now (there was not enough water)," said a man in El Fayoum who was paying the rice fine;

- Adding another cropping season, "Since the High Dam we grow three crops a year instead of two;"

- Benefiting from increased farm productivity, "There has been a 99 percent change in the water. In the past I could get 4.5 *ardabs* per feddan and now I get 18 *ardabs* per *feddan*" (an *ardab* is a unit measure of volume);

- Appreciating the ease of irrigation, "Before, we had to live in the hut [to irrigate with a traditional animal-driven waterwheel]; now in two hours we're through with irrigation;"

In terms of water quality, the changes from the past to the present are much more mixed. Most people in all three study areas perceived their water to be pristine in the past. While some areas mentioned improved drinking water, most noticed much more pollution of their drinking and field water. "Before, the water used to come red with clay, now it is clear" said one respondent. Whereas a man from El Fayoum was glad that the Nile flood did not bring water laden with red clay, some Dumiati men did not see it that way, "Before the High Dam, water came full of mud, and that benefits the land a lot. But now, the land is salty and polluted." In Dumiat in particular, water pollution is a serious concern now and in the future. Many Dumiatis echoed the theme of more but poorer quality water. In the words of two men from Dumiat, "Before the High Dam there was a water scarcity. Now there is more water, but it is polluted." "Before there was not enough water, but the quality was excellent. Now there is enough water, but it is polluted and unsuitable." "[Due to lack of water] I plant one third cotton and leave the other two-thirds fallow to have enough water. Did this ever happen before? "

Other changes from the past to the present include:

- Increased education for women and concomitant lessening of women's role in agriculture, "In the past girls went [to work] in the fields and it was a shame for them to go to school. Today, girls go to school and it is a shame for them to go to [work in] the fields," said a Fayoumi woman. "In the past, 11, 13, 9 years [old] and the girl was married. I married when I was 9 years old. Today, there are girls who go to college. Today, there is a primary and junior high school ... " an Aswani woman said. Both women and men mentioned this topic. It was almost always at the top of women's lists, while men also mentioned it but it was not always the first or second difference that came to their minds, although some men's groups mentioned it first, "Before, there were no educated women, and now there are women with high degrees. The education is better," was the first comment from an Aswani men's focus group;

- Women mentioned that they are now "more comfortable" due to labor saving devices such as tap water, washing machines (for those who can afford them), septic tanks, and the pleasures of television.

In terms of the future, there was a considerable regional difference. Dumiatis were quite unhappy with the decreases in the quality of their lives over the past 30 years (particularly with regard to water quantity and quality). To one Dumiati woman, the past "was the days of *baraka* [blessedness]." They were not usually as optimistic for the future or saw the future as something totally beyond their control. "God knows [what the future will bring]." "The water could increase or decrease."

In contrast, the great majority of people from El Fayoum and Aswan, who had already witnessed what they considered to be great changes for the better, were very optimistic about the future. "Our children's children will benefit. The government will improve and take care of our children better and they will be better than us," said a man from Aswan. An Aswani man from a

different village commented, "Every year will be better than the year before." In the future, "[Everything] will be fixed and it will be good," a woman from El Fayoum predicted. Another woman in her focus group continued, "There will be success in the future. Whatever is broken will be fixed." Most of the rural people interviewed during the course of this research remain cheerful and optimistic for the future, even though their lives are in the midst of much social change. The remarkable flexibility demonstrated by these rural people is truly impressive.

GENDER ANALYSIS

Note: This section provides context for gender-related information; the gender-disaggregated findings and their implications are integrated within the appropriate sections of the report.

Over the last twenty to thirty years, the lives of *fellahin* have undergone enormous changes and many of those changes have been related to water. Cropping has shifted from two to three per year. The Nile no longer overflows its banks and the quality of the soil has changed, becoming saltier in some places. Consequently, different crops must be planted.

In terms of gender roles, recent increases in girls' education, access in some places by some households to labor-saving devices and religious factors are some of the major factors of change in rural areas. Girls and boys are receiving equal education. In some instances, we encountered situations in which girls were more highly educated than boys. The almost universal availability of potable drinking water, usually within the house, has lifted an enormous time-consuming burden from the heads of women and girls. This change, along with the advent of other labor saving devices for women, e.g., gas stoves and washing machines, has meant an extraordinary decrease in work burden for wealthier village women.

Gender norms are changing as well. More educated women may be excluded from work in the fields or their participation in farm work may be reduced. It remains to be seen whether this will result in less input for women in agricultural and irrigation decision-making. One clear implication of this change is that many women now have more free time to watch television and many have the education to understand the programming.

COMMUNICATION CHANNEL FINDINGS

By far, television was the preferred channel of communication. Apart from Aswan, national television channels were watched most frequently. Dramas and mini-series (*tamsalayaat*), news, farm-related (*Ser il Ard*, *Sahbah il Kher*, *Ya Masr*) and religious shows were most popular among rural men and women. Men's television watching was largely in the evening after 7:00 p.m.; women watched both day and evening television shows. Another popular viewing time is Friday after the religious prayer shows (Sheikhs il Kher, Sharawi and Tantawi). In El-Fayoum, both men and women mentioned watched Channels 2 and 7, with women also watching Channel 1. On balance, Fayoumi women watched more hours of television than men. Aswani women appeared to watch the most hours of television - in the daytime and evening. There are reception problems in Aswan for the national and local channels. In Dumiat, Channels 1, 2 and 5 are popular with both men and women.

In order, interpersonal communication was the next most popular channel of communication, followed distantly by radio, children and newspapers. Men receive information from the agricultural cooperatives; females receive it through home-based meetings via the Ministry of Social Affairs. Both men and women are avid listeners to the radio Quran shows. Only a few women and men mentioned listening to news and agriculture shows. A few women did listen to radio all day but no men said that they did so. Other shows mentioned include: *Sot il Arabii* (a.m.), "On the corner" on Friday mornings, "*Mohattat Masri*" (by El Fayoumi women); "*Hadith E Ruh*""*Mohattat El Masr*" "*Cairo Kobra*" (by Dumiat women); News, Agricultural Programs (by very few Aswani men). In Dumiat, a few children were said to read papers and tell the news to their mothers (*Gomhuriya, El Akhbar, El Wafd*, news and accident reports).

IMPLICATIONS

1. As a result of their past interactions and impressions of the MPWWR, some farmers seem likely to screen out the MPWWR campaign messages. In order to accept or "hear" campaign messages, farmers will have to believe the source. The research results suggest that the MPWWR may also need to extend its public relations efforts along with the communication campaign.

2. Farmers should have a chance to see the Minister as often as possible through mass media. One option, if practical, would be to create periodic opportunities for direct access to the Minister through a call-in television show.

3. It would be very helpful if the campaign would explain the rationale for some of the Ministry's rules and regulations in order to create believability (e.g., the rice fine)

4. The farmer's role in managing the irrigation system should be explained since a significant minority do not seem to understand that maintenance of the *mesqa* is their responsibility (or the responsibility of a cooperative group).

5. Many farmers say that they are already using many good water conserving tactics, such as watering at night and leveling the land. In order to show farmers that the Ministry recognizes these efforts and to express partnership with farmers, MPWWR messages should cite farmers' water conserving practices and praise them for their conservation efforts.

6. Farmers appear to be remarkable practical and flexible in their behavior. Their changes in behavior are, to a large extent, based on practical considerations. If the Ministry is interested in changing the behavior of farmers - then these campaigns will need to explain to the advantages to farmers (e.g. increased income, decreased expenditure, reduced workload and/or reduction in water disputes).

   For example, if the Ministry wants farmers to plant crops that require less water), then the Ministry consider the list of factors that farmers consider when making a cropping decision. In addition, interpersonal communication channels might be advantageous in this effort because of the reliance of farmers on neighbors and agricultural cooperatives in farm decision making. The data seem to suggest that farmers might be willing to change the crops that they grow if their economic interests are served over time.

7. Water scarcity could be linked to population growth and the source of the Nile as outside Egypt, since many farmers already seem to be aware of one or both of these factors.

8. Since the High Dam is the way farmers divide the past (before the High Dam) and present (after

the High Dam), water scarcity could also be illustrated by the times before the High Dam when water was often scarce.

9. Since water seems to be a symbol for and source of life, and pollution seems to be regarded as bringing illness and death, images of water used in the campaign should emphasize water as the source of life. Farmers should be encouraged to protect that life.

10. In the future, more research may be needed into the matter of farmers' individual and group decision-making in order to target future campaign messages, develop appropriate images, and serve as a partner to help farmers appreciate water conserving alternatives to some of their present practices. In addition, communication campaigns would benefit from more research on how technical information is communicated among household members (e.g. husbands and wives, parents and children) and how behavior is changed in response to information coming from other household members.

11. Television will be the most important medium to reach male and female farmers. Even in areas where women do not farm extensively, they may channel information to men. Entertaining programs for women that include education on water scarcity could be useful. Pieces on the news and in agricultural programs would reach primarily men, but also some women.

12. Face-to-face communication in the village, e.g., through agricultural cooperative seminars, could also be important to increase the visibility and image of the Ministry, reach those who do not watch television, and explain hard to believe information (e.g., water scarcity in Egypt)

10. Children are an important communication channel and seem to be sources of information for some parents. The school program may be expected to increase parental awareness of water issues.

11. Since words for "*mesqa*" vary by location, MPWWR should pretest in, at least five different governorates, any language it used to refer to *mesqa*.

SELECTED RESULTS

Result 1: Communication Channels

> "Father's brother, ask us about something important!"
> You came to ask us about television and radio?!
> Father's brother, ask us about cultivation and irrigation!"

- For both men and women, TV is the most important communication channel, followed by face-to-face communication, radio and family children.

- Regional differences: Good national channel reception; Poor local channel reception
  Fewer men in Upper Egypt seem to watch TV.

- Gender differences:
  Men and women like some of the same shows; women watch more daytime TV shows (dramas, entertainment, etc.) & men mostly watch news or agriculture shows after 9 p.m.

  Agricultural cooperatives are the most common channel for face-to-face communication among males;

  For women, informal communication networks play a similar role.
  "If someone cooks food in her house, everyone knows"

Result 2: Awareness of Limits to Water

"Whatever happens in Egypt, happens here"

"If there were a scarcity of water in Egypt, we would all die."

- In all three areas, farmers are already acutely aware of local water shortages and changes over time (e.g. water availability before and after the High Dam).

- Local issues have the strongest influence on the farmer decisions about water use.

- However, some farmers in all three study areas were aware of national and local limits to water, as a result of information from TV and newspapers.

- Gender Differences: Women seemed less aware of the national situation than men.

Result 3: Water Conservation Behaviors

" The fellah must respect the canal: it is his life!"

- In all three study areas, many farmers say that they are already practicing water conservation and have been doing so for quite some time. These practices include:

    1. Timing of water (night, during the growing season)
    2. Crop choices (types, quick-harvest or drought-tolerant varieties)
    3. Leveling their land
    4. Cutting grass in the *mesqa*
    5. In all three study areas, farmers at the end of the *mesqa* have the most difficult time with water. However, many farmers have multiple plots located at different points along the *mesqa*.

    These practices can result in improvements in the efficiency of water use but do not always result in a net water savings for the local or national system.

- Gender differences:
  Most women do not go out at night so they are unable to water at night.
  However, in Dumiat, some women must water at night if their husbands are not present.

  In some places, a few women have a role in the decision-making about the choice of crops.

Result 4: Water Pollution - The Most Frequently Discussed Water Issue

"How can the water not be polluted!?
Everything - including dead dogs and donkeys - is thrown in the *bahr*."

- No other viable options for waste disposal from village.

- Canal pollution from other sources (e.g. medical and industrial wastes).

- Regional Differences: More severe problems in Dumiat (Lower Egypt).

- Gender Differences: Women speak of health; Men speak of crop damage

Result 5: Much Farmer Confusion over Farmer and Ministry Responsibilities; Some Farmers Appreciate the Difficulties of the Ministry

"Stop the rice fine or don't give us rice seeds."

"I raise a family, I'm responsible for my family. The Minister of Irrigation raises all the families."

"What can we do by our own hands?"

- The farmers want more government help with their farm problems - from irrigation to crop seeds and advice.

- Farmers do not always know who is responsible for solving which problems and where to go for help.

- Regional Differences: While this confusion was expressed by some in all study areas, the Dumiat people expressed more desperation about their situation.

- Gender Differences: Women talk about their families taking water complaints to the government in Fayoum and Dumiat but it was not commonly mentioned by the Aswani women.

Result 6: Priority on Self-Sufficiency for Families through Crop Choices

"If we didn't grow rice, what would we feed our children?"

- Self-sufficiency in food is a priority at the household level.

- Regional Differences: In Aswan, cash crops are prioritized; in Dumiat and Fayoum, households prefer to grow a mix of crops for home use and sale.

- Gender Differences: Women more commonly mentioned feeding their families; men appeared to select certain crops because they would earn more money for their families and/or their soils could only sustain certain types of crops.

  "This (rice) is the best crop to give (earn) money"

  "The soil is salty so we have to grow rice."

Result 7: Water is a Source of Both Conflict and Cooperation

"Water makes us argue amongst ourselves"

"Men argue about water"

"All of us in the village are one hand"

- In some places in all three study areas, water is a source of conflict between farmers and between farmers and the MPWWR.

- Farmers cooperate to share pumps and sometimes watering responsibilities.

- Gender differences: Because local irrigation decisions are largely made by men, most of the conflicts related to water are among men. However, conflicts related to water pollution occur between and among men and women:

  "Our neighbors become angry if we throw dirty water in front of the house, so we throw it in the *bahr*."

  "In the past, if a neighbor three something in the water, we'd fight her. We'd tell her to burn her garbage."

Result 8: Perceptions about Water in the Past, Present and Future

Past: "It was the days of baraka - *Kaanit zamaan helwa*"

Present:
"Before there was not enough water, but the quality was excellent.
Now there is enough water, but it is polluted and unsuitable."

Future: "G-d knows"
"The future will be better"
"There will be success in the future. Whatever is broken will be fixed."

- With regard to water, many people in the focus groups had pleasant memories of the water quality in the past but remember water shortages. Today, they appreciate that more water is available but are concerned with water quality.

- Regional Differences: Dumiat focus group members feel more desperate about the present and not optimistic about the future in comparison to those in Fayoum and Aswan.

Result 9: Farmer Flexibility and Adoption of New Behaviors

"There is a difference from the past. There are educated people. Any fever we have, we run to a doctor."

"Now we grow vegetables and cotton and melons. But before we were planting according to the quantity of water. Now the irrigation is continuous."

- From changing crops to adapting gender roles to current realities and coping with increased rural population densities, farmers in all three areas have already made changes in how they live and work.

- To make changes on their farms or irrigation practices, farmers need practical and economic reasons about the advantages of changing to other crops or farm practices. Positive behavior needs to be reinforced in communication campaigns.

- Gender and Regional Issues: As women become more educated and as families become wealthier, their families are more reluctant for them to participate in farm labor. In Aswan, men have had to increase their contribution to farm labor and hire outside laborers.

Result 10: Local Awareness about Population Growth

"There were 15 million people in Egypt and now there are 60 million."

" There were three in my father's house. Now there are 15!"

- In all three study areas, almost everyone in the focus groups was aware of the increase in population.

- Many people discussed the implications of population growth - crowded households, land shortages, food shortages, etc.

- People do understand that less water means lower crop yields and less food to feed their families. A few people are aware that this could mean that Egypt will need to import food in the future.

CAMPAIGN RECOMMENDATIONS

Theme Recommendations

Theme 1: Reinforce Positive Behaviors related to Water Conservation

- Combine awareness messages with praise for the many farmers who are already practicing water conserving behaviors:

  - clearing grass from *mesqa*s
  - timing their watering (night; during the growing season)
  - leveling land
  - choice of crops by type and water-conserving varieties
  - careful watering to avoid wasting water

  Water efficiency practices should be linked to the local and national needs to achieve a net reduction in water use (water conservation).

Theme 2: Water gives life

Because water gives life to everything, it is our responsibility to protect it

Theme 3: Scarce Water and Population Growth

As population increases, water will become even more scarce in the future.

Theme 4: Sharing the Nile

The source of the Nile is outside of Egypt and other countries depend on its waters. We must conserve our share of the Nile's water.

Theme 5: Feeding your family in the Future

We must conserve water to feed our families in the future.

Theme 6: Remember the past - think of the future

Remember the past - we had better quality water but water was scarce.
Now - we have more water but the water is often poor quality.
In the future - we will have less water and the quality will not be good.

Communication Channel Recommendations

Priority of Communication Channels: TV, Face-to-face, Radio, Kids, Newspapers

- **Recommended National TV Channels & Shows**
  Both women and men can be best reached using national television channels (1, 2, 7 and 5). The best hours are after 7:00 p.m in the evening or after Friday's Quran shows. Women can also be reached during the day. Drama and mini-series (*tamsalayaat*) are very popular with both men and women and news and farm-related shows are also widely watched. Campaign messages with a religious theme may be more effective if timed to follow the Quran shows. Other television spots should be positioned near the dramas and mini-series. News shows should be approached regarding more irrigation-related news. The farm-related drama and/or information shows could also include water scarcity and water conservation behavior themes and messages.

- **Recommended Local TV Channels & Shows**
  Poor reception for most local channels, particularly in Aswan. Channels provided later in the report.

- **Face-to-Face Communication Recommendations**
  Males: agricultural cooperative;
  Females: home-based meetings, Ministry of Social Affairs.

- **Radio Recommendations**
  In general, radio is not a popular medium for most of the rural residents interviewed. For those who do listen, both males and females favored the Quran radio shows. A few men and women listen to news and agriculture shows and there were a few women who listen all day.

- **Kids**
  A few children were said to read papers and tell the news to their mothers

- **Newspapers**
  In most study areas outside of Dumiat, newspapers were not common. In Dumiat, the newspapers mentioned included Gomhuriya, El Akhbar and El Wafd.

- **Images**
  Communication images should illustrate positive behavior rather than negative behavior. Whenever possible, women's involvement in farms (decision-making, field work, crop processing or marketing) should be shown. The images of water which are used can be drawn from those provided by farmers, including the human-like attributes ascribed to water. If new practices are going to be promoted, then the multiple benefits - economic, health, civic pride, religious, etc. - should be communicated.

- **Priority Language**
  Since there are variations by region and sometimes by gender, the communication campaign should tailor regional spots by using local words for canals.

APPENDIX A: MAP OF STUDY SITES

APPENDIX B: CONTACT LIST

Contact List for El Fayoum, Aswan and Dumiat Governorates

El Fayoum
Undersecretary of Ministry of Public Works and Water Resources (MPWWR):
Engineer Samir Yiaequop
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Irrigation Engineer, Shoras:
Engineer Ahmed Ibrahim
Telephone: 084-343137; 344936

Irrigation Engineer
Engineer Ayman Ahmed
Telephone: 084-343137; 344936

Aswan
Undersecretary of MPWWR
Engineer Khairy Shehata
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Engineer of Irrigation, Aswan Center, Aswan
Engineer Hesham Abdelaal Farghly
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Assistant of the Manager
Engineer Khaled Mahdy
Telephone: 097-302582 work; 322044 home

Assistant of the Manager
Engineer Madeh Hussein
Telephone: 097-302582

Dumiat
General Manager of MPWWR
Engineer Mohy El Hlaly
Telephone: 057-334109/223108 work; 057-600531

District Engineer of KFR Saad
Engineer Magdy El Said Khalil
Telephone: 057-600753

APPENDIX C: TRAINING SCHEDULE

Training Schedule - Workshop on Qualitative Research Methods for WCU-Greencom Irrigation Water Use Study (August 14, 15,17, 18, 1996)

Wednesday, 14 August 1996 (MPWWR, CAIRO)

9:00-9:05	Opening (Dr. John Woods, GreenCOM)
9:05-9:15	Ice-breaker exercise
9:15-9:30	Participants' expectations of the workshop
9:30-9:35	Review of training agenda
9:35-9:40	Goals of the research project
9:40-9:50	Research program
9:50-10:05	Overview of participatory rural appraisal and participants' experience
10:05-10:35	Communication skills (Professor Ali Agwa)
10:35-11:00	Break
11:00-11:30	Quantitative and qualitative research (three handouts)
11:30-11:50	Sampling (one handout)
11:50-12:35	Qualitative research (one handout) - Types - Ethics - Bias
12:35-1:35	Focus group discussions (one handout)
1:35-1:45	Break
1:45-2:45	Focus group discussion -- including role plays
2:45-3:00	Questions and answers

Thursday, 15 August 1996 (MPWWR, CAIRO)

9:00-9:15	Review of Day One
9:15-10:45	Review of focus group discussion guide and focus group discussion role plays
10:45-11:00	Break
11:00-11:20	Processing of role plays
11:20-11:35	Gender analysis
11:35-12:15	Individual in-depth interviews and introduction to interview schedules (one handout)
12:15-1:15	Individual in-depth interview role plays
1:15-1:35	Processing of role plays
1:35-1:50	Questions and answers
1:50-2:00	Review

Saturday 17 August 1996 (FIELD TRIP TO QALYUBIYA)

- Practice focus group discussions & individual in-depth interviews
- Pretest disucssion and interview guides

Sunday 18 August 1996 (MPWWR, CAIRO)

- Processing field trip
- Modifications of discussion and interview guides, as needed
- Data analysis discussion (one handout)
- Overview of planning, implementation and using qualitative research in communication
- Review and oral post-test

APPENDIX D: FOCUS GROUP DISCUSSIONS AND IN-DEPTH INTERVIEWS

Distribution of Focus Group Discussions by Governorate

	El Fayoum	Aswan	Dumiat	Grand Total
Female	3 Biahmo, Kfour El- Nile	3 Darawa,Kjoj, El-Manshia	3 El-Anina, El-Salam, El-Wastane	9
Male	3 Biahmo, Kfour El-Nile	3 El-Mansoria, Kjoj, El-Selsela	2 El-Anina, El-Salam	8

Distribution of Individual In-Depth Interviews by Governorate

Respondent Category	El Fayoum	Aswan	Dumiat	TOTAL
Male Irrigation Engineer	1	2	0	3
Male Bahar(i)	0	0	2	2
Male Agricultural Engineer	1	1	0	2
Male Omda	1	2	1	4
Male Sheikh El Balad	0	0	1	1
Male Sheik for Mosque	1	0	1	2
Female Teacher	1	1	1	3
Female Outreach Worker	0	1	1	2
Total	5	7	7	19

APPENDIX E: ENGLISH VERSION OF THE FOCUS GROUP DISCUSSION GUIDE

FOCUS GROUP DISCUSSION GUIDE

Make sure you have all information from the cover sheet for each participant (interviewer and moderator, date, village and governorate, age group, first name of participant and her husband and oldest child's name--for women, highest level of education completed, crops grown this year. Ask these questions during the course of the focus group when there is a natural lead in or at the end of the focus group.

Introductions

Tell about purpose of the discussion--to investigate the subject of irrigation in villages in order to get the ideas of farmers [if it is a woman's group, to get the idea of female farmers because we particularly value their opinions] for the Ministry. The Ministry wants to use the information for planning on the subject of irrigation in villages. All the information that you give us will be confidential. We will not say, "This person said this" to anyone. There are no right or wrong answers. You are the experts on irrigation in your village and we have come to learn from you.

Establish Rapport

Ask if you may record the group (if yes, then turn on the tape recorder)

- How do people here irrigate their land?

  Explore differences between irrigation, underground water
  Use participants' own words and categories in all the following questions.

[For Dumiat only:
- Tell us about what you use irrigation water for--other than crops]

- What is the difference between the amount of [irrigation] water in the past--your father's or grandfather's times--and now?

  - What do you think is the cause of that difference?

- Are there any other differences between water in the past and now? If yes, can you use water in the same way that your fathers and grandfathers used it? {for women, explore both irrigation water and water for household use}

  - What do you think is the cause of the difference?

- What do you think will happen to water in the times of our children and grandchildren?

- What leads you to believe this?

- [if some or all said] You [or some of you] said that there is a difference in water between the past and now. Because of this difference, are you doing anything different from what your grandfathers {for women, grandmothers} and fathers {for women, mothers} did when they farmed the land? [If yes, what are you doing?]

  - [If appropriate] How difficult is this to do?

  - How have these changes in what you do affected your life?

  - Do your neighbors know you are doing this?

  - What has their reaction been?

- Do people ever discuss water?

  Explore content of the discussions, whether there is tension over water--if so what has happened and how long this went [is going] on, causes of any tension about water, who talks about water with whom

[For women:
- What work do you do on the farm? [ask about what they do in relation to watering the fields]

  - Are there any crops that you prefer to grow?
    - What makes them preferable?

  - Are there any crops that you do not like to grow?
    - What about them makes you like them less?

  - What crops did your family grow this year?

  - In your family, who decides which crops to plant each year? How do you know which crops your husband (or other family head) has decided to plant? If you have an idea of something you want to plant, how do you let your husband know?

  - What do you do in addition to working on the farm?

  - If you compare your life and your work to your mother's and grandmother's lives, has there been any change? [Explore how their lives have changed]

- [If yes], what do you think some of the causes of this change are? [For example, some of you have been to school. How many grandmothers or mothers went to school?]]

[[For men:
- Do any women help you with the farm work? Which women?
    - What do they do? What do they do to help with watering the fields?
    - In the past, did your mothers and grandmothers help with farm work?
    - [If there has been a change in women's work] Some of you mentioned that your wives and/or sisters do not help with farm work, unlike your mothers or grandmothers. What do you think has caused this change?]]

- Who decides which crops to plant in your household?
    - How does that person/how do you decide?
    - When is the decision made?
    - What kind of discussion happens before the decision is made? [explore with whom]

- What kind of knowledge do your wives have about irrigation?]

- What problems with irrigation does your village face?

- What have you done, as a village, to handle these problems?

- Is there anything you can do to prevent these water problems in the future?

- We hear that there is less water and poorer quality water in many villages throughout Egypt. What do you think is happening?

- What do you think the solution is?
  Explore what they think village can do, they can do, and whomever else they say is responsible for the solution

- Have any of you tried [first mention the techniques mentioned by the group in the previous questions, if not mentioned, ask about]:
  1. Watering at night
  2. Levelling the land
  3. Growing crops that need less water

--for each crop mentioned: which crops are most profitable? which crops are least profitable? Which crops are most convenient for you to grow? In what ways are they convenient? Which crops are least convenient to grow? In what ways are they inconvenient? [If not mentioned, ask about rice and sugar cane if appropriate to the area]

4. Reusing drainage water

[for all mentioned by moderator but not tried by participants]--Have you ever heard of anyone who did this? Why would someone do this? What would be likely to happen if someone did this?

[for all tried by at least one participant]--How long have you done this? Why did you begin doing this [if relevant, why did you stop doing this]? How did other people react when you did this?

[For women:
- Where do you get water for your family's use?
- How do you carry it from [use the sources mentioned above] to home?
- Where do you keep it at home?
- What do you use the water for once you get it home?
- How do you get rid of water at home once you have used it?
- How do you use the water you get from outside the house?
- Water in the house costs about how much per month? Are there any problems in paying?]

- Have any of you ever thought about where the Nile begins?

- Are there problems with irrigation water that you would like to bring to the attention of the Ministry of Irrigation in Cairo?

- What would be the best way to get you information about irrigation water [and other relevant categories they mentioned earlier]?

  Explore: -television? (How often do they watch? What do they watch? How much attention do they pay to what they watch?]
  -radio (How often do they listen? What do they listen to? What are they usually doing while they listen?)
  -through their children at school
  -pamphlets (with pictures for low-literate audiences)
  -movies
  -any other method

- What is the name of the irrigation engineer here?
  - Do you meet with him? [if yes, how often?]
  - What does he know about the situation we were discussing?
  - When you meet with him, what do you discuss?

    - What do you think of his advice?
    - Have you ever done anything differently after talking with him? [Explore what]

- [If not mentioned earlier] I wonder, if someone told you that there was a scarcity of irrigation water in Egypt, what would you think?

- What word would you use to tell people that Egypt has a scarcity of water?
    - What do the words "nodrat il maya irray" mean to you?
    - What do the words "ezmit il maya irray" mean to you?
    - What do the words "allit il maya irray" mean to you?
    - What do the words "shahit il maya irray" mean to you?
    - What do the words "naqis il maya irray" mean to you?

- What does "pollution" mean to you?
    - Use participants' answers to ask: How would you normally refer to this? [How would you say pollution in the *mesqa*? in the fields? in the drainage system?]
    - What causes pollution in villages? in Egypt as a whole?
    - Has there been any change in the level of pollution over the course of your life? Between now and your father's (or grandfather's) time?

Thank the participants for cooperating in our study.

APPENDIX F: ENGLISH VERSIONS OF THE IN-DEPTH INTERVIEW GUIDES

In-Depth Interview Guide for Agricultural Engineers (English Version)

- What kinds of irrigation water exist?
- What do you think are the problems with irrigation that Egypt is facing?
- In your opinion, what are the causes of Egypt's current water shortage?
- What do you think will happen with these problems in the future?
- What is the basis for your beliefs?
- In your opinion, what problems with irrigation are faced by your village (where you are working)?
- Who discusses water with you?
- How did you respond to them?
- In your opinion, what is the impact of agricultural liberalization policies on the distribution and management of irrigation water in Egypt?
- In your opinion, what is the impact of agricultural technology on irrigation water?
- What kind of help have you been able to give to the farmers?
- What has the been the reaction of farmers to your help?
- What are the circumstances which led to this reaction?
- What are extension methods that you can use to handle these problems?
- Are these methods available?
- What other organizations or people can you cooperate with to handle water problems?

In-Depth Interview Guide for Mayors (English Version)

- In your opinion, what are the problems which Egypt faces with respect to irrigation water?
- What do you think will happen to the irrigation water situation in the future?
- What leads you to hold these opinions?
- Do people discuss water with you?
- How did you respond to them?

IRRIGATION ENGINEERS

The team conducted in-depth interviews with three district irrigation engineers (two from Aswan and one from El Fayoum). No indepth interviews were conducted with any of the engineers from Dumiat because they were absent from their offices during the four days that the team was in Dumiat. Neither of the two district engineers contacted by the team in Dumiat appeared at the time they and the team had agreed upon for their appointments.

Responsibility

The engineers described their job responsibilities. All the engineers said that they were responsible for the fair distribution of water in their districts. Two engineers felt that it was their role to try to solve the farmers' irrigation problems and if they failed, to refer the problems to a higher level of responsibility. One engineer said that he was responsible for cleaning the canals of grass in order to ensure equitable distribution of water to all canals and *mesqa*s. With respect to problems, all three engineers felt that the cause of the problems was in all cases the farmers themselves.

Relationship with Farmers

The Aswani engineers both said they enjoyed a good relationship with the farmers. However, the engineer from El Fayoum said his relationship with farmers was problematic.

Relationship with other Ministries

All three engineers said that there was no interministerial cooperation. However, there were formal committees on agriculture and on irrigation and the irrigation and agricultural engineers meet at these meetings. One engineer said that there is no communication between him and the agricultural extension worker except in cases of problems or when he needs information.

Problems

All engineers said that cleaning was a problem. The engineers in Aswan also said that pitching of the canals and sandy canals was a problem. The Fayoumi engineer said that the farmer's tendency to take water illegally by opening the canal gates themselves was a problem. One engineer mentioned that pollution is a problem with irrigation in Egypt.

Two engineers said that the fellahin are not aware of the rational use of water. Two engineers complained that fellahin do not receive information on irrigation.

One complained about the need for equipment. Two said they wanted training.

Reasons for Problems

The engineers blamed the farmers for most of the problems: the farmers insist on doing illegal things such as growing rice and opening the doors of the canal themselves; the farmers are illiterate; the farmers are not aware of how to manage water; the farmers need to clean the *mesqa*; the farmers irrigate without pumps. The Ministry was also held responsible for lack of equipement for pitching and cleaning.

One engineer said that farmers talk to the BAHARI about water problems. Another engineer said that the BAHARI needs to receive incentives to work; therfore he felt that the Ministry should provide monetary incentives to the BAHARI. One engineer said that the BAHARI in his area is illiterate. Another engineer expressed the opinion that the BAHARI can play a role in creating awareness for irrigation issues among the farmers. Although the team was unable to interview any irrigation engineer in Dumiat, farmers in focus groups expressed strongly negative feelings about the BAHARI in their areas. This was not the case in either Aswan or El Fayoum.

Engineer's Job and Needs

All the engineers expressed frustration with their roles. They believe they are trying to fulfill their job responsibilities, but are misunderstood by the farmers. In addition, all mentioned the need for further training for new engineers. One of the engineers mentioned that the Ministry hires contractors for canal cleaning and maintenance.

Information

Channels of information proposed by engineers include: television, radio, sheik of the mosque, teachers, informal leaders, bahari, newspapers, themselves. Topics that the engineers felt important to communicate to farmers include: scarcity of water in the future, the impact of international relations on the availability of water in Egypt, and the rational use of water so that land may be reclaimed.

Bahari

Initially, the team did not include the *Bahari* in the in-depth interview sample. However, it became apparent in focus groups, especially in Aswan, that the Bahari was the only MWPW staff member in close contact with farmers. The team therefore decided to interview the Bahari in Dumiat. Interviews were conducted with two *Baharis* in Dumiat.

Bahari

The *Bahari* is an employee of the MWPW who is found at the village level. The team interviewed two *Baharis* in Dumiat governorate.

Responsibilities

The *Bahari* keeps watch over the level of the canals in his area and informs those responsible in the district MWPW. The *Bahari* takes his orders from the district engineering office. He keeps watch over the canal banks and maintains them. He keeps an eye out for illegal activites regarding irrigation and informs his superiors. He distributes water to the farmers. He informs the engineering office immediately if there is grass that needs to be cleaned from the canals. He also keeps the engineering office informed of the progress of the *karaka*.

People's Reaction to MWPW

The *Baharis* claimed that the people thank the Ministry for delivering water. If there is no water, the *Bahari* goes to the engineer and tells him to open the doors. The second *Bahari* said that almost no one complained of water to him.

Illegal Activities

One *Bahari* said that at first he talks in a friendly way to farmers who are acting illegally. If this does not work, he reports them. The other *Bahari* said that he informs the engineer directly.

Outreach

Both *Bahari*s reported that they went among the farmers to speak to them about irrigation. One gave them helpful pointers on irrigation, while the second *Bahari*'s purpose was primarily to detect illegal irrigation activities.

Outreach to Women

Only one of the *Bahari*s reported conducting any outreach activities to women.

Relationship with Irrigation Engineer

One *Bahari* sees the irrigation engineer twice a week and in emergencies. The other *Bahari* says that he only sees the engineer in case of complaints. Both *Bahari*s reported good relationships with the engineer.

Relationship with Agricultural Engineer

One of the *Bahari*s met and consulted with the agricultural engineer, while the other *Bahari* said he did not know the agricultural engineer.

AGRICULTURAL ENGINEER

The agricultural engineer, unlike the irrigation engineer, is not a graduate of the prestigious faculty of engineering. The agriculture engineer receives a bachelors degree from the faculty of agriculture and is not, strictly speaking, an engineer. The Ministry of Agriculture assigned at least two agricultural engineers to each agricultural cooperative. The agricultural engineer is assigned to a village, whereas the irrigation engineer is assigned to a district. The team interviewed two agricultural engineers, one in El Fayoum and one in Kajoj.

Discussion of Irrigation Water

One agricultural engineer said that people talk with the MWPW supervisor or with the responsible people in the Ministry. The second agricultural engineer said that he handles small irrigation problems himself.

Both engineers reported that people talk about water shortages in their village. They also discuss grass and water lilies clogging the irrigation waterways.

Role of the Agricultural Engineer in Irrigation

Both engineers collected information on irrigation problems. One engineer used the information to write a report, while the other engineer reported problems directly to the MWPW.

Reaction of People to Agricultural Engineer

Both said they enjoyed a good relationship with the farmers in their villages. They attributed their success to their ability to respond quickly to the farmers' problems. They are able to send for the irrigation engineer, who comes quickly.

Opinion on Irrigation

Both engineers were pleased with the state of irrigation in their areas.

Farmers' Awareness of Irrigation Issues

The two agricutural engineers said that the reason for irrational water use is the regimen of irrigating without pumps.

Role of the Agricultural Engineer in Creating Awareness

The engineers volunteered to explain to farmers how to irrigate each crop according to each needs.

Suggestions for Channels of Communication

Both engineers suggested using seminars. One suggested using television and the other proposed using radio. An engineer said that loudspeakers would be useful. All these methods are available in villages.

Suggestions for Help in Communication

Both engineers spoke of calling upon ministries and other organizations for help in the campaign: Ministry of Agriculture, Ministry of Irrigation, local council, agricultural cooperatives, and the sheikh el balad.

Future of Irrigation

The engineers had different views on the future of irrigation. One said that the water would be sufficient, while the other spoke of the need to rationalize consumpton.

Influence of Liberalization Policy

[For the past two years farmers have been free, according to national policy, to grow whatever crops they desire. Prior to this time, the Ministry of Agriculture told the farmers which crops to grow on which land.]

The two engineers held opposite views on the policy change. The engineer from Aswan was very positive about the change, whereas the Fayoumi engineer seemed to feel that it was a mistake.

Influence of Technology on Irrigation

Both felt positively about technology and one engineer looked forward to the introduction of new technology into the irrigation system of Egypt.

Relationship with Irrigation Engioneer

Neither reported having much relationship with the irrigation engineer and did not know their engineers' names. However, they met the irrigation engineers at the meetings of the district irrigation and agriculture committee meetings.

FEMALE OUTREACH WORKER

The team interviewed two female outreach workers. However, the first was a member of the Ministry of Health and specialized in family planning. She was unaware of any irrigation or

farming subjects and spoke only of family planning. The team, therefore, discarded her interview data. The secound female outreach worker is employed in the Ministry of Social Affairs (MOSA). The MOSA maintains a large cadre of female outreach workers country-wide. These outreach workers are called upon to undertake campaigns on a number of social issues. The outreach worker is from Aswan, and lives in the village she serves.

The outreach worker spoke of the problem of grass clogging the irrigation system and preventing water from reaching the fields. She said that she might help by getting the *Bahari* to open the gates of the canal. She suggested that she might help in the irrigation campaign by organizing seminars and gathering women to attend them. She proposed that the best channels of communication with village women are seminars, television, and pamphlets for those who know how to read. She felt that pictorial materials were unsuccessful because adults did not have a chance to read them; they were attractive to children and the children played with them so that the adults did not have access to them. She felt that women would respond to the campaign. She is in the habit of organizing lectures for women from 10 to 11 in the morning.

FEMALE TEACHER

The team interviewed three female primary school teachers, one from each of the study governorates. All the teachers lived in the study villages in which they were interviewed. One of the teachers was a college graduate, the others were high school graduates.

Change in Women's Lives

The three teachers felt differently about changes in women's lives from the past: one said that nothing had changed. A teacher living in Upper Egypt maintained that women in the past worked only in the house, whereas now they go to the fields to farm. The third teacher said that women in the past worked more in the fields than women do today.

Quantity of Water

The teachers' responses about the quantity of water curently available in their areas also varied. One teacher said that she could not compare the amount of water available today to the amount of the past. A teacher from Dumiat said that the water was less than previously and the teacher from El Fayoum said that the water was more than in the past.

Water as a Topic of Women's Conversation

Two of the teachers (in El Fayoum and Dumiat) reported that women talk about water. These teachers commented that if the woman is educated, she sends complaints. The Aswani teacher said that women did not talk about water.

Water and School Children

Rural Egyptian children learn about water through science and other activities in schools. All of the teachers said that the topic of water must be included in the curriculum of Egptian primary school children. One of the teachers explained that conservation and rational use of water should be included in the curriculum. Another teacher says that she talks to the children on the importance of water. The third teacher placed water in the context of the environment.

Communication Channels

Two people said that television was the best way to reach villagers. One said that the Immam of the mosque was a good person to communicate with farmers. Another said that the school director could be enlisted to help with a communication campaign. One teacher suggested the head of the local village council. A teacher mentioned "opinion leaders" but did not specify who these were. Another suggestion included teachers and older family members. Seminars could be used.

Women's Education

All of the teachers said that the percentage of girls educated is far more than boys. The percentage of girls educated is very high until after junior high school graduation, said one teacher.

The Teacher's Role in a Water Campaign

All three teachers said that a campaign could include schools. Two added that parents' councils could also play a role. [Parents' councils are voluntary organizations. The paarents meet once a month to discuss school issues and childrens' programs].

APPENDIX H: IRRIGATION SYSTEM WITH ARABIC TERMS