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Social Research Center  
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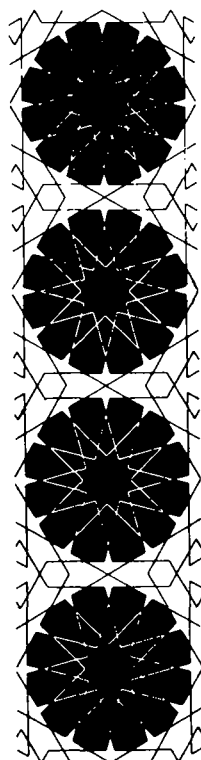
## **WOMEN, WATER, AND SANITATION: HOUSEHOLD WATER USE IN TWO EGYPTIAN VILLAGES**

By

**SAMIHA EL-KATSHA**  
et al.

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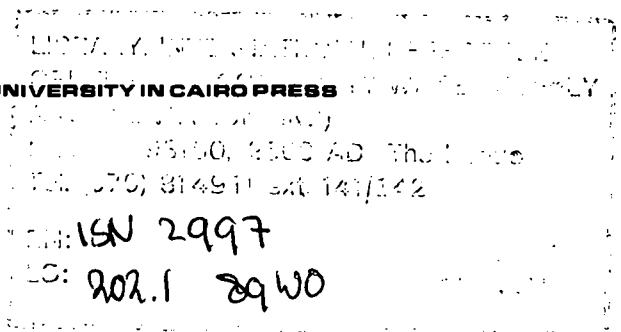
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By

**SAMIHA EL-KATSHA  
AWATIF YOUNIS  
OLFAT EL-SEBAIE  
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## EDITOR'S NOTE

**CAIRO PAPERS IN SOCIAL SCIENCE**, with this issue, inaugurates a series of cooperative publications with the Social Research Center of the American University in Cairo. We are particularly pleased to welcome this study on women's use of water in rural Egypt as the first example of this cooperation. We expect others to follow, perhaps at the rate of one a year. Each of these issues will have its appropriate volume and issue number in the **CAIRO PAPERS IN SOCIAL SCIENCE** series, and a number in the SRC Occasional Papers series. It is a pleasure, through this collaboration, to facilitate the distribution of some examples of first-rate social research.

Nicholas S. Hopkins  
Editor  
**CAIRO PAPERS IN SOCIAL SCIENCE**



## ACKNOWLEDGEMENTS

This monograph is a revision of a report submitted in 1986 by the Social Research Center (SRC) of the American University in Cairo (AUC) to the Ford Foundation. It is based on research conducted by the SRC in collaboration with members of the High Institute of Public Health, Alexandria University, and funded by the Ford Foundation.

The authors wish to express their deepest gratitude to Dr. Gilbert White, Mrs. Ann White, and Dr. Cynthia Myntti for their guidance throughout the course of research. Special thanks are owed to Dr. Hind Abou El-Seoud Khattab and Dr. Belgin Tekce for reading the first draft of the report and for their valuable comments.

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A profound note of gratitude is owed to Dr. Nicholas Hopkins who devoted much of his time and effort to present this report in a publishable form. Without his critical comments and insights this work would not have been possible to appear in that shape.

The authors are grateful to Ms. Hanan Sabea for her help in preparing the report for publication in this version. Special thanks are extended to Ms. Iman Hamdy for processing and careful proofreading of the final version of the monograph.

Last but not least, the authors are most grateful to the people of Babil and Kafr Shanawan for their cooperation that enabled the research team to carry out this study.



## PREFACE

This publication launches the new Social Research Center series of the **CAIRO PAPERS IN SOCIAL SCIENCE**. All the monographs to be published in this series will present results from one of the Center's research projects. The research of the Center is concerned with important issues of socioeconomic development, such as population growth and control; early teenage marriage, fertility and health; maternal mortality; child survival; international migration; socioeconomic factors affecting endemic diseases; women's role in development; and public participation in local development and in the maintenance and upgrading of the environment.

This monograph presents the results of a study, funded by the Ford Foundation, that relates three important components of human survival - women, water and sanitation. This study, entitled "Women, Water and Sanitation," constituted the preliminary phase of what developed into one of the major action/research programs of the Center. It is a typical example of SRC's approach to development research.

The first phase of the Center's projects are usually micro-studies, utilizing both sociological and anthropological research techniques, the purpose of which is to gain the insights and the understanding of the situation necessary to embark on more extensive and sophisticated studies of specific development problems. These preliminary investigations usually look into and describe the behavior patterns relating to the development issues selected as the focus of the research, the role of various significant players, and the sociocultural milieu within which the development processes and problems are played out.

The information gleaned from these initial micro-studies is then used as the basis for designing and implementing one of two types of follow-up-projects: (1) more extensive studies of larger samples to be able to produce generalizable results; or (2) action/research programs experimenting with new approaches for the resolution of identified development problems at the grass root level. The latter type of programs always aims at soliciting public participation and the mobilization of local skills and resources as well as encouraging technical and financial inputs from the regional and national levels.

An action/research project was developed on the basis of the information published in the present volume and is funded by the International Development Research Center (IDRC), Canada. It aims at finding the best approach to creating awareness of environmental hazards and at encouraging the village population, mainly the women and children, to participate in the upgrading

of the community's water sources and waste disposal facilities, introducing better hygienic practices, and improving sanitary conditions in the village and within the homes. One of the conclusions of the project is that women are very receptive to new ideas concerning hygiene and sanitation and are willing to help in improving village conditions. The more surprising result of the study is that children are one of the most effective channels for introducing new practices into the home.

In its research projects, particularly those requiring technical inputs from disciplines not represented in the Center, the collaboration of other Egyptian institutions is sought. In the case of the "Women, Water and Sanitation," project, the staff of the High Institute of Public Health participated in an important way as members of the research team.

The action program was also implemented, as in other research programs, with the close cooperation of village council, local government personnel, and the staff of the Ministry of Health at the village and governorate levels. The Center's experience has proved that the collaboration in the public as well as of decision makers and service providers offers an important channel for communicating research results, no less important than the present publication aimed primarily at the academic community.

Laila el-Hamamsy  
Director, Social Research Center  
American University in Cairo



## CHAPTER ONE

# HEALTH IN RURAL EGYPT

### Statement of the Problem

Health is a major issue in the development of rural Egypt. Water and sanitation affect health and are the foundation upon which any intervention can be based. Yet many of the usual policies have often proved unsuccessful, so maybe it is time to return to basics. There is thus an urgent need for current information on environmental conditions and their impact on health and sanitation problems in rural communities. This study of women's practices with regard to water and sanitation in two villages in the Egyptian delta, carried out by the Social Research Center of the American University in Cairo, provides such information.

Simply providing reliable sources of clean water, information, or economic incentives does not improve health. Egypt, for instance, was the first developing country to supply potable water on a national scale and now has a higher per capita number of doctors, nurses, clinics, and medicine than most developing countries. But its rates of infant mortality remain as high as those of countries with much less health infrastructure, and diarrheal disease is still reported as a major cause of death. Infant mortality has been reduced in recent years, but it was estimated at 88 deaths per 1,000 in 1986 (World Bank, 1988).

Suggestive of this situation are two problems often encountered by engineers and administrators who seek to improve the water supply and sanitation facilities in villages. One is the puzzling question of why facilities such as a new hydrant or a pit latrine, or information about health hazards, are not used effectively. The second is why improvements are not necessarily accompanied by significant reduction in mortality and disease prevalence.

Miller, in his intensive appraisal of health in four governorates (1981), stressed that no data were available on personal hygiene and food handling in rural Egypt. Miller also found that over half of the population studied was infected by at least one parasite. Moreover, according to the MetaMetric Report (1981), the Egyptian village now faces critical sanitation problems related to water supply and waste disposal. An accurate assessment of the present situation is the first step towards improvement.

Women are the key agents in any planned change since they play four key roles in the household and in the community at large, in relation to water and sanitation: (1) as acceptors or rejectors of new technology; (2) as users of improved facilities; (3) as managers of water supply and sanitation programs; and (4) as agents of behavioral change in the use of facilities (Elmendorf, 1982). To understand how they play these roles, it is essential to describe precisely what women and associated members of the household do with water, excreta, and other waste within their households and what seems to account for their action. Hence, the present study. Since behavior patterns cannot be studied in isolation from the existing environmental sanitation, it was desirable to combine socio-anthropological and environmental approaches.

Dunn (1979), the W.H.O. (1983) and Elmendorf (1982) have all stressed the importance of understanding "health behavior" since it has a direct effect on the potential health benefits for both the family and the community. In seeking partial explanations for the various health practices, several factors were considered. These were: 1) Household facilities and economy - the equipment and technologies available to the household and within its economic reach; 2) Information possessed by the housewife, including ungrounded perceptions; 3) Values shared by the household; 4) Intervention of societal agencies - local, governorate and national governments and non-government agencies; 5) Environmental conditions - availability and quality of water and soil in and around the household. In a rough fashion, the possible relationships among these patterns of behavior, outcomes and factors affecting them may be charted as shown in the model in Figure 1, which serves as a framework for the study.

### **Objectives**

The objectives of the research were (1) to determine the patterns of women's behavior related to the handling and utilization of water, and associated materials for household purposes and the disposal of sillage; (2) to identify some linkages between behavioral patterns and the transmission of water-borne and water-washed diseases; (3) to seek an understanding of the cultural and household economy contexts within which the behavioral patterns find their rationale; (4) to determine present environmental sanitary conditions, both at the village and the household levels; and (5) to investigate the extent to which women understand the mechanisms of disease transmission.

## Methodology

The research was conducted in two villages in Menoufia governorate, located approximately 70 kilometers north of Cairo. There were several reasons for choosing these two villages. (1) The range in size, education and occupation of villagers in the two villages is normal for Egypt. (2) The Social Research Center had previously carried out research in these villages which provided rich background information, although not on water supply and sanitation. (3) Both villages are located near a *markaz* town (local administrative center) and are on a paved road. The villages and their water use and sanitation practices are similar.

The fieldwork was carried out between October 1984 and December 1985. Data collection methods included: a general sample survey; intensive investigation of a selected subsample; participant observation; group discussions; observation of all public water facilities; bacteriological and chemical assessment of public and private water resources; and other environmental assessments.

TABLE 1

### SAMPLING ACCORDING TO HOUSE TYPE

	Kafr Shanawan			Babil			TOTAL
	All Facilities	Latrine Only	No Facilities	All Facilities	Latrine Only	No Facilities	
<b>Survey of 312 Cases</b>							
Red Brick	102	11	1	22	33	6	175
Adobe	23	12	3	5	78	16	137
<b>Intensive Observation of 46 Cases</b>							
Red Brick	15	2	-	5	4	--	26
Adobe	3	2	1	1	12	1	20
<b>Participant Observation of 10 Cases</b>							
Red Brick	2	-	1	1	1	-	5
Adobe	1	1	-	1	1	1	5

A 25% sample of households in the villages (N=312) was selected, stratified according to house type, and was used to collect the general data (see Table 1). A subsample of 15% (N=46) was then selected for the intensive anthropological study and for the environmental assessment (including water and stool sampling). Ten cases were then selected for participant observation.

House type was chosen as a proxy variable to stratify households, because it captures many aspects of the quality of the domestic environment. The operational definition of house type depends on the construction material, the presence of piped water, and the availability of latrines. There are several reasons for the use of house type as a variable. (1) The house type may affect the general sanitary facilities due to the building material, the type of floors, ventilation, water supply, excreta disposal, and raising of livestock. (2) The two prevailing types of material used for construction (adobe and red brick) indicate residences with more or less similar properties in respect to economic, educational, and occupational levels and in respect to social status. However, some prominent families still maintain their adobe houses. (3) The adobe house remains the traditional type in most of rural Egypt, although the trend in recent years is towards red brick houses. Villagers are liable to build red brick houses when the adobe house is destroyed and needs to be replaced, or when young married couples desire to establish their own residence, or when returning labor migrants invest in construction. (4) Families who own livestock find it more convenient to keep their adobe houses, since the design is more suitable for livestock raising. (5) However, we found that there were no significant differences in behavior related to water, or in the educational level of the occupants, between the two types of house.

The interviews conducted with the general sample elicited information on: (1) age, sex, education and occupation of household members; (2) house structure and facilities; (3) food preparation and storage; (4) utensils used; (5) water sources used within the village; (6) practices for the use and storage of water for drinking, cooking, bathing, house cleaning and washing; (7) types of latrines; (8) water and waste disposal practices; (9) child rearing practices; and (10) health care, morbidity and mortality of children and adults.

A subsample was selected for intensive and in-depth questioning concerning behavioral patterns related to water use and household hygiene, including (1) the means of obtaining and storing water; (2) where and how food is prepared and stored; (3) child feeding, care of sick children and defecating habits; (4) latrine conditions and use; and (5) care of livestock, dairy production and processing of dung cakes.

These households were also subject to an environmental assessment, including biochemical tests of water for its chemical, bacteriological, and

parasitological contents, examination of the stools of women and children for parasites, and the establishment of indicators of household hygiene that relate to disease transmission. Three such indicators were computed: fly index, crowding index, and ventilation index. The fly index refers to the number of flies per square meter of surface area, the crowding index to the number of persons per habitable room excluding latrines, baths, and kitchens, while the ventilation index refers to the ratio of the area of the openings (windows and doors) to the floor area.

A further ten of these 46 households were investigated in greater depth by direct participant observation of activities of individual family members. This included: (1) actual use of soap for hand washing either before or after attending to the different household chores; (2) socialization process, with special attention to teaching the use of hand washing, to preparing of supplementary infant food or breast feeding, and to defecation habits; (3) information on the extent to which women are aware of the scientific understanding of disease transmission.

Finally, group meetings with women were held to discuss the pressing sanitary problems encountered, and possible solutions as perceived by women. Each meeting was attended by 10 to 15 women from the 46 households.

Moreover, environmental data were obtained through guide lists and observation sheets. Samples of all public water sources in both villages taken in April and October 1985, were subjected to chemical, bacteriological and parasitological analyses. These water sources included public systems, standpipes, hand pumps, and canals. Public space, institutions (mosques, schools, etc.) and their facilities were also examined.

The samples obtained from various water sources were analyzed for their bacteriological, parasitological and chemical contents. A snail survey was conducted in the canals used to supply water, and in which laundry and utensils were washed. Stool samples from females age 15 and above and from the 46 subsample households were analyzed according to Feachem's environmental classification of water-related infections and disease transmission mechanisms (Bradley and Feachem, 1978; Feachem et. al., 1983). This classification includes (1) faecal-oral transmission/ water-borne or water-washed diseases (diarrhea, dysentery, typhoid, ascariasis), (2) water-washed diseases (skin and eye infections), (3) water-based diseases (schistosomiasis or bilharziasis), and (4) related insect vector diseases (malaria). In this study we attempt to verify Feachem's assumptions and to compare them with the findings of our research under the following headings: (1) disease transmission in relation to water source, storage, and handling, (2) disease transmission in relation to child rearing practices, (3) disease transmission in relation to environmental conditions and sanitation, and (4) knowledge of water transmitted diseases in relation to the attitudes and practices as affected by water use.

## **Incidence of Disease in the Study Villages**

Before discussing the data on health behavior, we summarize here the health and disease situation in our two study villages. The major health problems encountered are of two categories. The first includes diseases related directly to water use and disposal, such as gastrointestinal diseases, infections of skin and eye, parasitic diseases e.g. amoebiasis, ascariis, and bilharzia. The second includes diseases not directly related to water use, e.g. measles, respiratory diseases, and tetanus.

We can discuss the problem of water-related infections in both villages in terms of the classification given by Feachem (1984). However, while his classification fits the conditions in the study villages in some respects, in other respects it does not fit as explained by the following: 1) The **faecal-oral** category is still the main group that affects the population in both villages. As regards the mode of transmission, the environmental conditions and the behavioral factors in the current study are in contrast with the control measures stated by Feachem, for some diseases show differences. Control of faecal-oral diseases can be achieved by safe water quality, although Feachem stressed the role of water availability, which is not a problem in either of the two villages. On the contrary, water can be procured in abundance from more than one source at the same time; the problem is water quality. As reported by informants and observed by research team during the course of the research, the abundance of water means that waterwashed diseases (skin and eye) rank lower than the faecal-oral diseases. Actually the former diseases rank the lowest of all. 2) Poliomyelitis is mainly a **droplet infection** due to overcrowding, whereas Feachem points to the importance of water availability as a measure for control. However, water quality is more important, since in some cases sewage is discharged into the canal water, which could be the source of infection by poliomyelitis. 3) Ascariis and trichuris are mainly **food-transmitted** diseases due to the unsanitary handling of human excreta, with all the consequences of eating raw foods without proper washing, and the role played by the flies. This agrees with Feachem who ranked food hygiene as the fourth highest control measure. 4) **Water-borne** diseases such as bilharziasis show similarity from both Feachem's and the current study's points of view, stressing the role of excreta disposal. 5) **Water-related insect** diseases show the same characteristics, except that the unsanitary disposal of solid wastes into Babil's canals enhances the spread of these diseases by blocking the water flow.

For the total population of the 46 subsample households, it was reported by the informants that gastrointestinal complaints were most numerous

(39.3% in Babil and 35.0% in Kafr Shanawan), eye complaints next most common (31.8% and 30.9%), respiratory disease running 7.5% and 5.4%, other fevers 4.8% and 6.3%, with all others amounting to 16.6% and 22.4% (see Table 2). The examination of stool samples indicated positive cases for parasitic diseases as shown in Table 3.

The health status of the villagers proved to be correlated to some of the environmental conditions. There is a positive relation between crowding and the frequency of flies on the one hand, and the prevalence of diseases and mortality rates among children below 10 years of age on the other hand. There is also a correlation between poor ventilation and the prevalence of respiratory diseases and measles. Since these diseases sometimes result in death, ventilation may be determined as an indirect cause. However, this definite correlation between the behavioral and environmental aspects, on one hand, and the associated health problems on the other hand, requires much intensive research beyond the scope of this study.

### **Organization of this Study**

This study is organized progressively as follows. First we give an overview of the role of women with regard to water, which they use for various purposes. Then we examine the various water sources in the village and how they are used. Following that we turn to the water and sanitation practices of the women in the two villages, before examining women's practices with regard to food preparation and health care for their infants and children. Finally, a conclusion ties the material together.

TABLE 2

**REPORTED DISEASE RATES AND THEIR RANKS  
FOR KAFR SHANAWAN AND BABIL**

	1	2	3	4	5	6	7	8	9
<b>Survey of 312 Households (Children) *</b>									
Kafr Shanawan									
Percentage	41.7	7.2	8.4	31.2	0.3	0.3	-	-	10.9
Rank	1	4	3	2	5	5	-	-	-
Babil									
Percentage	40.4	11.9	7.7	27.8	-	0.5	-	-	11.7
Rank	1	3	4	2	-	5	-	-	-
<b>Survey of 312 Households (Adults) *</b>									
Kafr Shanawan									
Percentage	35.0	5.4	6.3	30.9	0.2	0.2	-	-	22.0
Rank	1	4	3	2	5	5	-	-	-
Babil									
Percentage	39.3	7.5	4.8	31.8	-	0.6	-	-	16.0
Rank	1	3	4	2	-	5	-	-	-
<b>Survey of 46 Households *</b>									
Kafr Shanawan									
Percentage	51.8	22.4	3.8	7.0	0.6	2.9	2.6	0.3	8.6
Rank	1	2	4	3	7	5	6	8	-
Babil									
Percentage	40.8	15.3	12.9	9.9	8.2	6.8	2.7	0.3	3.1
Rank	1	2	3	4	5	6	7	8	-

Diseases:

1) Gastrointestinal; 2) Respiratory; 3) Other fevers; 4) Eye; 5) Anaemia; 6) Skin; 7) Urinary; 8) Tetanus; 9) Other diseases

N.B.

\* Percentage according to the total number of patients attending the health unit or other services

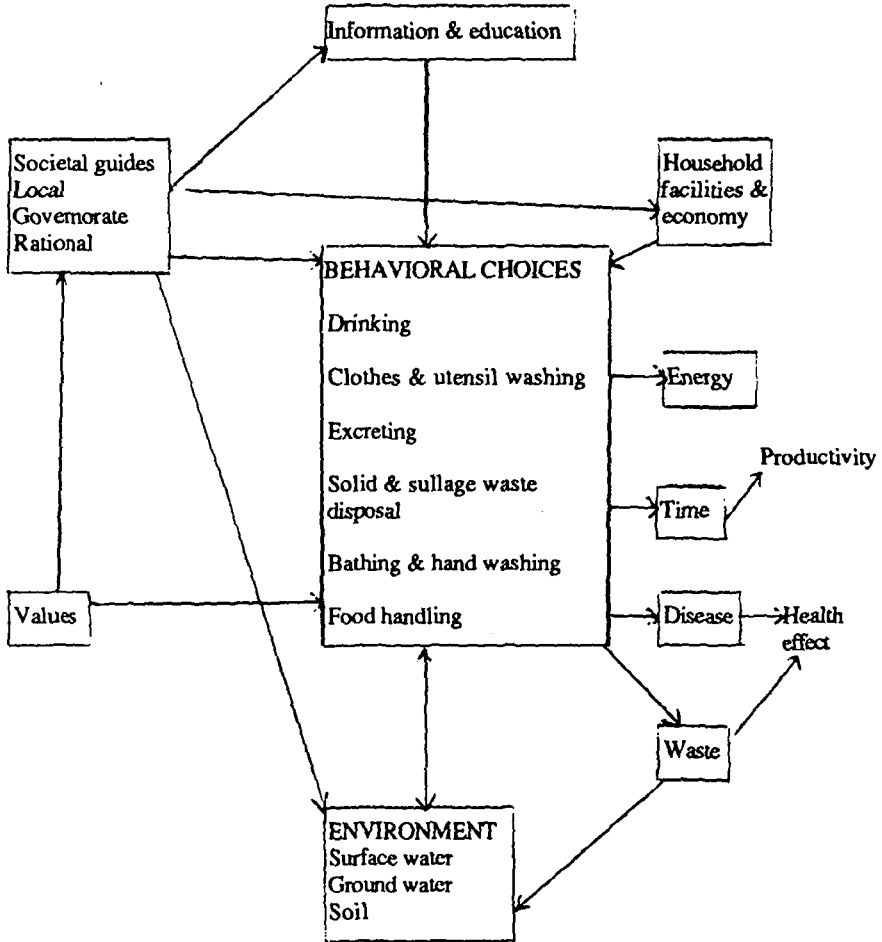


TABLE 3

**INFLUENCE OF PARASITIC DISEASE  
FROM STOOL EXAMINATION:  
SURVEY OF 46 HOUSEHOLDS**

	PERCENTAGE OF POSITIVE CASES AMONG TOTAL NUMBER EXAMINED			
	SCHOOL CHILDREN		ALL OTHER MEMBERS	
	BABIL	KAFR S.	BABIL	KAFR S.
Bilharziasis (Schistosomiasis)	2.9	10.6	7.4	7.7
Oxyuris	1.5	0.7	-	-
Ascaris	3.5	0.6	7.4	15.4
Trichuris	-	0.2	-	-
Ancylostoma	-	0.4	-	-
Amoebiasis	-	-	11.1	15.4
Trichostrongyliasis	-	-	-	3.8

FIGURE 1  
**WOMEN'S BEHAVIOR  
 AFFECTING WATER AND SANITATION**



## CHAPTER TWO

### THE RESEARCH SETTING

This chapter describes the social and physical structure of the villages of Babil and Kafr Shanawan to provide the background for a better understanding of the social context of water use and waste water disposal in rural Egypt. First we describe the village, then turn to the house as a health environment.

#### Two Villages in Menoufia

Babil is one of the 43 villages of Tala district in Menoufia governorate, and one of the seven villages under the administration of the village council located in Babil. The official 1976 population was 5,183. The land area of the village is 1059 feddans, the majority of which is cultivated.

Babil has a recently paved road in the southern part of the village which runs along the main canal. It leads west to Tala town and east to the village of Ganzour. With the exception of two or three streets that are fairly large, the streets and alleys within the village are narrow, dirt roads.

Before the 1952 Revolution in Babil one family stood out as the most powerful. Its power derived from its wealth, as family members used to own most of the farm land in the village. *Omdas* (village chiefs) were and are still being selected from this family. However, the authority and prestige of the *omda* has diminished, while others in the village have acquired education and wealth. Because Babil does not have a local police unit, the *omda* acts as police representative at the village level. His main function is to settle disputes between villagers; however, if he fails to do so, the case is sent to the nearest police station.

Public services in the village include the Village Council, responsible for the local operation of all public services, and the Agricultural Cooperative. In Babil there is also a private pharmacy and two private clinics. The mosque offers showers, latrines, and wash basins which are used heavily by the male population. The water supply in the mosques of Babil is more reliable than in Kafr Shanawan because there are several sources of water in addition to the roof tanks. The villagers in Babil make more use of the facilities at the mosque because they have fewer facilities at home.

**Kafr Shanawan** is one of the 36 villages of Shebin el-Kom district in Menoufia governorate, and one of the two villages under the administration of the village council that is located in the adjacent village of Shanawan. The official population in 1976 was 2,843. The village land area is 360 agricultural feddans in addition to 50 feddans used for homes and other buildings. Kafr Shanawan lies on the main road from Cairo to Shebin el-Kom, the governorate capital.

In Kafr Shanawan, about a dozen families stand out as influential. Most of these families are related by marriage. *Omdas* and other leaders were always selected from one of these families. Until the Revolution of 1952, the main function of the elders within these families was to settle disputes and to enforce law and order at the village level. A council headed by the *omda* was usually selected from the elders of these families to assume the role of a governing power. After the revolution, these councils ceased to function and the role of the *omda* became more of a honorary post. His duties are now assumed by the police unit in the village.

Kafr Shanawan has the same services as Babil, though many of them are physically located in the contiguous village of Shanawan where there is a village council, an agricultural cooperative, a veterinarian service, a Community Development Society with a nursery school and a sewing class for girls. More recently, Kafr Shanawan has been acquiring its own institutions: an extension of the main health unit in 1979, and a post office and a consumers' cooperative in 1983. There are also two mosques.

The two villages have undergone parallel changes in the last generation. The spread of free education has led to a remarkable improvement in individual economic and social status. Possibilities for migration outside Egypt have introduced a major new source of income, to which both skilled and unskilled laborers have access. Their remittances have improved the standard of living, both socially and economically. The old contrast between formal and informal leaders has disappeared, in part because of the expansion of the number of formal posts in the village political structure. Now even people with considerable informal influence are likely to occupy formal leadership positions, on the Village Executive Council, the Local Popular Council, or the agricultural cooperative.

### Services

The real spread of public services in rural Egypt dates from the 1952 Revolution. This includes educational and health services, along with general administration, agricultural, and so on. In recent years, both villages have received funds through ORDEV (Organization for the Reconstruction and Development of

Egyptian Villages) for the development of village infrastructure, through a program designed to foster decentralization. Both have spent part of their money on improving clean water supply, mostly to extend the network of house connections. This is now given a higher priority than improving public water points. In Kafr Shanawan, money was allocated for the purchase of a huge truck for septage evacuation.

Two institutions in particular are important for health issues: schools and health clinics. Babil now has two co-educational primary schools with an enrollment of 869 students, while in Kafr Shanawan there is one co-educational primary school with 680 students. Schools are important both as a source of health education and as an example of hygiene. Health education in primary school is only taught at the third grade level. Part of the science curriculum is devoted to simple hygiene instructions.

The school health programs are supervised by the health unit which is responsible for sending a "health visitor" to the various schools two or three days per week. The duties of the health visitor include the detection of health problems among the students, food distribution, and inspection of the hygienic standards of classrooms, playgrounds, and toilet facilities.

According to Assaad and El-Katsha (1981), "Upon inspection of one of the schools in Babil, the playground and classrooms looked relatively clean, but the toilets were in a lamentable state, very dirty, smelly and run down." The conditions remain the same. The headmaster said, *"What can I do? There are not enough toilets; they do not correspond to the number of students and they have no flush system. Another problem is that at times we stay without water for long periods of time."*

The health units in rural Egypt provide, in various degrees, preventive and curative services for all ages with a special service for maternal and child care as well as health service to the school age children. The maternal and child health center's main service is immunization, family planning, and treatment of diarrheal diseases among children.

The Babil health unit began service in 1966. It is presently staffed by a doctor, nurses, a nurse-midwife, a part-time sanitarian, and a lab technician. It has an out-patient clinic, maternal and child care service, a pharmacy, and a bureau of vital statistics. The quality and number of personnel working in these units are adequate. Laboratory facilities for diagnosis are not adequate, therefore diagnosis is not reliable. Furthermore, cases of diarrhea are underreported as registration entails filling out several forms and records and requires field investigation which is not possible in remote areas.

Health unit personnel periodically collect water samples from the public water sources and samples from prepared food vendors to be analyzed in the governorate capital. However, the analysis does not comply with the proper standards, i.e. sampling procedures are defective. For instance, it was observed that they use unsterilized sampling bottles. Also, results are not reported regularly, thus local authorities are not immediately aware of defective samples.

The sanitarians are supposed to inspect the environmental sanitation of the water, refuse, sewage, schools, mosques, markets, streets and cemeteries around the village. Their activities, however, do not include supervision of household sanitation, nor checking the sanitary conditions of the privately owned hand pumps. The regulations of the Health Directorate do not include the inspection of private pumps, whether located inside or outside the houses.

Inspection of food handling and supervising the cleaning of public places should be carried out daily. However, the sanitarian in Babil is responsible for two other villages, so can devote only two days a week to each village. The supervision of community sanitation is inadequate.

## Houses

One very important aspect of the hygiene situation in the two villages is the type of house construction. The two main types are houses made of adobe, or sun-dried brick, and those made of concrete. Some of the latter have wooden roofs, and differ from the completely concrete houses. Here we describe the different house types and analyze them as health environments.

Our research findings showed no correlation between the socioeconomic status of villagers and the type of house in which they reside. Both adobe and red brick houses were inhabited by people of similar characteristics. For instance, we recorded the education level of all members, aged over 6 years, in the 312 households surveyed, but could find little difference in either village according to their distribution in adobe or red brick houses. There was, at best, a slight tendency for those with secondary education and above to reside in red brick houses.

In Babil the majority (61.9%) of the 642 houses are old and built of adobe. The adobe bricks used for construction are manufactured locally. They are of a mixture of mud, hay, straw, and water made into blocks 25 cm. in length and 10 cm. in width, and are left to dry in the sun before use. At present, adobe is not being used for new houses in this village.

The rest of the village houses are built either of red brick and wooden roofs or red brick and concrete roofs. The difference is that the latter is built with a

concrete foundation to allow for building two or three additional stories which is similar in design to city apartment buildings.

The red brick-plus-concrete or wooden ceiling houses constitute 38.1% of all the houses within the village of Babil. Houses built with wooden roofs are built with one floor and are less costly. Most of the one-story houses in the village that are built of adobe or red brick are inhabited by the owners, while the owners of buildings with several stories live in one or two of the apartments and rent the rest.

As in most Egyptian villages, houses in the main residential area of Babil are grouped in clusters. The houses are constructed on both sides of the narrow streets and alleys, and are built adjacent to each other with no space in between. Hence, there is hardly any room left for building new houses in this area. A few villagers, however, are replacing the old adobe houses within the village cluster with concrete ones.

The trend now is to build most of the houses on the outskirts of the village, using part of the agricultural land. However, permits are required from the agricultural cooperative prior to building on cultivated land. Most of the new houses are built with red bricks and concrete ceilings. Unlike the cluster housing in the main residential area, the new houses are spread out with some space in between.

We observed that adobe houses are not being replaced by red brick houses as fast in Babil as in most other villages in Menoufia Governorate. This is perhaps due to the fact that Babil does not suffer from a high water table which causes water seepage, and affecting the adobe houses that are built without foundations to crumble.

The majority of the houses in Babil were constructed during two decades: 1955-64 (23.7%) and 1975-85 (30.6%). These spurts point to two different important developments in the history of Egypt. First, after the agrarian reform the peasants financial condition improved considerably, which might have had a direct bearing on the fairly high rate of houses built during 1955-64. Second, according to Khattab and El-Daief (1982), during 1975-85 the migration of male labor to the Arab states had a direct effect, since the majority of the migrants they interviewed "stated the importance of buying a small lot of land on which to build an independent home."

There are a total of 609 houses in Kafr Shanawan. Here the majority of houses (75.7%) are built with concrete ceilings and red brick, while only 24.3% are made of adobe. The house structures, the clustering of houses within the residential area, and the new trend of building on the outskirts of the village are very similar to Babil. The main difference between the two villages is that most

of the adobe houses in Kafr Shanawan have been replaced rapidly within the last 15 years.

Two reasons were behind this boom. In 1965, the ground water started to pose a problem for the village encouraging labor migrants to invest in building new houses. The other factor was the installation of electricity in 1964, which encouraged younger people to settle down in the village and commute to work in Shebin where many job opportunities were available.

### **Description of the Two Prevailing House Types**

Since the house type is a major factor in the health environment in the villages, we present here a detailed description of the predominant characteristics of the interior of the two house types prevailing in both villages.

**Adobe houses.** Most of the interiors of the adobe houses are similarly structured. The first striking feature is the designed wooden doors, which are usually very large in size. The entrance leads to a big courtyard, *hosh*. Most of the courtyards are left without a roof; only in certain houses is the courtyard partially covered with palm reeds. Courtyards are utilized for different purposes. The outer section is used mainly as a sitting room for the women, and is also used as a kitchen when they attend to their cooking and preparing of tea and laundry. The inner section of the yard is used on one side for the oven, and the area (100 by 50 cm) situated under the staircase leading up to the roof is used as a latrine. Roofs are used mainly for the storing of dung cakes and straw for fuel or for poultry raising. In a few cases, one or two extra bedrooms may be built on the second floor. Another prominent feature in the adobe houses is the built-in cupboard. This small niche is usually found in the thick walls of the guest room and is used mostly for storage.

Most of the families who own livestock devote a special room in the inner yard of the house (*zareeba* or stable) to their animals. The *zareeba* has neither ventilation nor a separate door leading in and out of the house. Either in front of the house or just by the entrance door, most houses have built a bench (*mastaba*) 50 cm high made of adobe. A blanket or a straw mat is thrown on top of it. Whenever water is extended to the house, one tap is placed by the entrance door with no connection to any drainage system, as described in the previous chapter. The number of rooms differ from house to house depending on the available space.

But in each house there is at least one room located close to the entrance door which is used mainly for visitors and overnight guests. It has a



fairly large window (1 meter by 1.5 meters) overlooking the street, thus allowing for ventilation. The villagers ensure that the visitors' room is kept clean and has high quality furniture. This room is used mainly for receiving guests, but in many cases some members of the family sleep in it. It is furnished with two or three wooden couches (*kanaba*) that are multi-functional. They are used for sitting and sleeping, and certain foodstuffs are stored under them. The *kanaba* is covered with a mattress, pillows against the walls, and a colorful spread. The floor is covered with a straw mat. Because this room is used as a living room, the T.V., cassette player, radio, and fan, if available, are put there. Generally, the floor of the visitors' room is plastered with cement and the walls are whitewashed. The rest of the rooms are primarily used for sleeping. They are usually situated in the inner section of the yard and are poorly kept and not ventilated. The rooms, are rather humid, have floors that are dusty, and the walls are not whitewashed. The furniture of these rooms consists mainly of one or two beds.

The head of the household usually sleeps in the guest room, while the older children sleep in a separate room with other family members. In most cases, all the nuclear family crowd into one room and siblings share the same bed.

**Red brick houses.** The main difference between red brick houses with concrete roofs and those with wooden roofs is in the layout of the house and the number of floors. The entrance door is small and leads to a large hall that is divided into two sections. The outer part, which is used as a sitting and dining area, is roofed. The inner section, which is usually not roofed, includes the kitchen, latrine, and the storage room. The piped water tap connected to some type of simple drainage is usually installed in this area. The visitors' room is situated at the left side of the outer hall which has a separate entrance door. Additional rooms are used for sleeping and storage. The oven and the animal shed, if available, are found in the yard or empty space at the back of the house in the inner section of the hall.

The basic furniture of this type of house is similar to that used in the adobe houses, except that it is of better quality. In most houses there are additional pieces. For example, tables are covered with table cloths and bedrooms may have cupboards, dressers, and curtains. Most rooms have access to some kind of ventilation, whether in the form of small or large windows. Walls are whitewashed and most floors are tiled.

Houses built with concrete roofs are similar to the multi-story apartment buildings found in the city. Each floor consists of one or two apartments comprising several rooms, each with large windows providing good

ventilation. In addition, there is a kitchen, a bathroom, a latrine, and a multi-tap system, all of which are attached to the house sewerage system.

The standard type of furniture used by this class of families in the village corresponds to that used by middle class people in the city. That is, there are complete sets of furniture for the guest room (salon), dining room, and bedroom.

### Housing Environment and Health

The environmental assessment confirms that the type of house construction is correlated with hygienic standards, and thus is an important factor in understanding disease transmission. The adobe houses stand out as the poorest in hygienic standards.

Facilities related to hygiene differed between two types of houses. There were differences in floor type, ventilation, crowdedness, presence of flies, availability of piped water, separate kitchen, latrine and stables. Tables 4 and 5 show that adobe houses rank lower in terms of the facilities available, which increases the vulnerability of their residents to diseases that might not be related to water use, the focus of this study. For instance, 85% of the adobe houses in the sample have dirt floors, and 88% raise animals, while only 53% of the adobe houses were observed to have good ventilation compared to 72% of those of red brick houses. On the average, being more damp, having dirt floors and being poorly ventilated, adobe houses favor breeding microbes and the transmission of certain diseases (e.g. respiratory diseases).

TABLE 4

#### PERCENTAGE FACILITIES IN TWO HOUSE TYPES IN 312 HOUSEHOLDS

Characteristics	Adobe (137)	Red Brick (175)
Piped Water	21	71
Latrine	86	95
Dust Floor	85	55
Separate Kitchen	13	60
Animal Raising	88	27
Electricity	98	99

TABLE 5

## ENVIRONMENTAL CONDITIONS IN 46 HOUSEHOLDS

Index	Number of Households			
	Babil		Kafr Shanawan	
<b>Crowding Index</b>				
Less than 2		14		10
2 to less than 4		8		11
4 and more		1		2
<b>Fly Index</b>				
less than 110		3		3
110 and above		20		20
<b>Ventilation Index</b>				
	Adobe	Red Brick	Adobe	Red Brick
Good (>0.1)	6	8	4	12
Fair (0.1-0.139)	5	1	2	2
Poor (<0.1)	3	-	-	3

On the other hand, water borne diseases, the focus of this study, related largely to behavioral patterns that are pursued equally in adobe and red brick houses, irrespective of the economic, educational or occupational backgrounds of the residents. This conception of hygiene is acquired through socialization processes and determines the variants of hygienic behavioral patterns adopted by women. Our findings indicate that one cannot correlate poverty with unhygienic behavioral patterns, since following simple hygiene does not require money. For instance, to keep a latrine clean does not require more than covering the opening and cleaning it on a regular basis; separating the stable from the living quarters can be achieved by the use of any available material, i.e. an old ladder, piece of cloth, etc. Soap for hand washing is always available since even the poorest house had soap to wash utensils and laundry.

Generally speaking, sanitary conditions in adobe houses are poor. Most of the adobe houses, especially in Kafr Shanawan, are damp on the inside because of the high ground water table. Damp floor may increase the incidence of chest infection and droplet infection. Hence, the probability of air-borne and droplet infections is high. Houses built with red bricks and wooden roofs have properties similar to the adobe house, since most of these houses resemble the adobe in

layout. In relation to the houses built of concrete roofs, the general environmental standards are better and the general upkeep is easier.

Moreover, humidity is usually high in the dirt-floored houses, which also enhances the spread of diseases (Rakha et. al, 1982). In both villages, the disease incidence reported during the field observation was higher among dirt-floor houses. Two cases of tetanus, three cases of measles, nine cases of tonsillitis, and three cases of ringworm were reported by families living in dirt-floor houses, while none were reported from houses with other types of floors. This may be due to the fact that cleaning floors covered with tiles or cement is easier and the humidity is less, thus diminishing the possibility of contracting these diseases - especially tetanus (Hanafi and Ghoneim, 1985).

However, this does not rule out the fact that adobe houses might be cleaner and better kept than red brick houses. This is due to the way women behave within each household irrespective of house types and regardless of socioeconomical background. It is a result of the women's perceptions and views on cleanliness and tidiness that they have acquired and learned through the socialization process.

In this chapter we have looked at the research site, the two villages in Menoufia, both as a sociopolitical environment and as a health context. The focus has been on the community factors, and on the physical setting for the behavior of women with regard to water. Next we turn to an examination of the women's role itself.

## CHAPTER THREE

### WOMEN AND DOMESTIC WORK

In this chapter we look at the daily tasks performed by women in Babil and Kafr Shanawan, both from an anthropological and from an environmental perspective. The focus is on the place of women of different ages and marital statuses within the household structure. We also give a brief account of a typical day in a peasant woman's life, including the prominent variations which might serve as a guideline in formulating planned change for later programs which focus on women's participation with regard to water use, environmental sanitation, and hygienic standards. The description gives an account of all the daily activities women must pursue and accomplish. It provides the time element and suggests suitable times to approach women should planners aim at introducing educational programs or income-generating activities. Moreover, it is important to give an account of the magnitude of women's daily activities as a verification of the findings of studies conducted in other developing countries (White, 1972; Elmendorf, 1981; Roark, 1984). The time analysis is preceded by a general discussion of women's role in household work.

#### The Family

The structure of the traditional peasant household has undergone change. However, some of the basic elements persist whether the household is based on a nuclear or an extended family. Definite jobs are assigned to each family member according to sex and age. Men have different obligations from women within the household, and among women, responsibilities vary according to age and marital status. Senior males usually provide food, clothing, schooling, etc. for all the family members. On the other hand, women are responsible for all household chores and for the socialization of the children.

There is usually a hierarchy within each household affecting the roles and functions of women in their ongoing daily house chores. This hierarchy is organized differently in extended and nuclear families. In extended families, the eldest women, i.e. the mother-in-law and the eldest son's wife, control and divide the responsibilities of work among the rest of the women within the household.

The eldest women supervise the work. Most of the work is delegated to the youngest daughter-in-law, who is expected to attend to most of the daily chores, such as fetching water, laundering, washing utensils, disposing of used water, cooking, etc.

In nuclear families, the mother delegates and divides the daily work among her daughters. If she has no daughter, she carries out the daily activities herself. In some cases, the eldest daughter drops out of school at an early age in order to help her mother with the housework.

Girls must follow their mother's instructions for all housework. Even when educated young girls would prefer not to wash in the canals, they must obey if their mothers insist.

Women generally sponsor the socialization of the children. In the extended family, the senior woman shares in the process with the actual mother, while in the nuclear family, it is the mother's duty alone. Girls at a very early age, 8 to 10 years, help with the simple housework that does not require strenuous effort, such as washing a few utensils, looking after younger siblings, cleaning vegetables, sweeping floors, etc. But by the age of 13 or 14, more responsibility around the house is delegated to them; in fact, they begin to maintain the same work load as the adult women. Mothers are proud of the training procedure, since it enables their daughters to master all housework skills before marriage. Such training assures that the daughter will be an asset when she gets married and moves to her new house.

Once a daughter gets married, she assumes full responsibility and is expected to attend to most of the daily chores in her husband's residence. Her work load will only diminish once she gives birth, especially if she has moved into an extended family.

Although women spent most of the day attending to a heavy work load in mostly unsanitary conditions, their work is not recognized or remunerated. They are considered by the Egyptian labor force as unpaid family help.

### **A Typical Day in the Life of a Housewife**

A typical day's work for women entails accomplishing their daily chores, looking after their immediate family, and sharing in social activities, e.g. visiting the sick, having out-of-town visitors, attending or helping in a wedding or funeral, etc.

An ordinary day in a woman's life is divided into three periods:  
1) mornings - from the time she wakes up until around 1 p.m.; 2) early afternoon-

from around 1 o'clock until close to sunset; and 3) evening - from sunset until sleeping time.

**Morning.** Part of the morning is spent on chores carried out in the house, while other tasks are performed outside the house. At least one female member of each household goes out daily within the village to keep up the house work, i.e. fetching water from public standpipes, getting rid of used water, washing utensils and clothes in the canal, and purchasing daily food supplies, if needed.

**Duties performed before leaving home.** Women ordinarily wake up early to attend to livestock, or to help dress and feed young children going to school, or whenever they have work in the fields. It was observed, however, that women nowadays do not start their day as early as they did before, especially wives of labor migrants. These women may begin their day at about 9 or 10 a.m. One respondent said: *"Peasant women have changed. They prefer to sleep late in the morning like city women."*

Once a woman is up, she prepares tea and a breakfast composed of low-fat cheese and bread for the family. She then helps her youngsters get ready for school. As soon as her husband and children of school age leave, she begins her house work.

First, if the woman has an infant, she might breast feed him, change his clothes, and then resume her work. If she has poultry, she changes the water and replenishes the food. For a family who owns livestock, a woman starts her day by cleaning the *zareeba*. She then puts away the family's night clothes and arranges the bed. Meanwhile, she starts to collect all used eating utensils from the previous night and all clothes that need washing. Once or twice a week, she prepares the dough for baking bread and leaves it to leaven. Dung cakes are made once or twice per week.

**Tasks Performed Outside the House.** The work inside the house usually lasts until about 10 a.m. Once a woman accomplishes these chores, she starts her work outside the house.

Some of the fundamental tasks performed daily are fetching the water from the different sources outside the house, getting rid of used water, and washing laundry and utensils. These jobs may require several trips back and forth, but as mentioned previously, women make use of the water source near their homes. Midmorning is the appropriate time for women to accompany a sick child, or an infant who needs immunization to the health unit. Once a week a woman frees herself to go to the weekly market. She either goes to buy or to sell her goods, i.e. vegetables and dairy products. Otherwise, she buys her daily supplies whenever needed. During the mornings she may share in reciprocal social

obligations - such as preparation for weddings, funerals, or circumcisions. Once in a while, women might go to a nearby town or village either to buy goods, or to seek medical help, mostly when children are sick. Husbands may accompany their wives on such visits. Once a month women go to the village cooperative to receive their ration of flour, rice, sugar and tea. When husbands are busy or away, women may take any livestock to graze in the fields.

**Early afternoon.** At around 1 p.m. women return home. They prepare a light lunch for children returning from school. The meal consists of leftovers or any available food at home. If a woman's husband is working in the fields, she may take lunch to him and return with some fresh vegetables for daily consumption or to sell to neighbors. She may collect some dry twigs for fuel. On baking day, she starts to bake the previously prepared dough with the help of other women from the household or neighborhood. Afterwards, she manages the storage of water, which requires cleaning and refilling of containers. Then she cleans at least part of the house by sweeping or washing floors with water (depending on the material the house is built with). Towards the late afternoon she starts with the preparation of the evening meal. Meanwhile, she either supervises or attends for the second time to changing and replenishing water for the poultry.

**Evenings.** Evenings begin shortly before sunset. Women are by that time through with their daily work. As soon as all family members are home, they are ready to have their main meal, after which the men may go out for evening prayers or social calls. During the evenings women may engage in some sewing or needle work, or may watch T.V., either at home or at a neighbor's house. Villagers do not sleep as early as they used to in the past due to the introduction of electricity and television.

A typical day in the life of working women, either as agricultural laborers or employees, differs between those who live in nuclear families and those who live in extended families. Working women in the latter group are relieved from their daily chores, as they are undertaken by one of the nonworking women in the household.

Those living in nuclear families, however, attend to all their house chores upon returning from work, following patterns similar to employed urban women. Regarding chores connected with water use, the majority use piped water installed in their homes, or else may secure the help of close relatives or neighbors in fetching water from outside sources. One woman said: *"You see - we work double: mornings in our job, and afternoons to catch up with our daily obligations. This is why it is difficult for us to attend meetings outside in the afternoons."*



In summary, it is quite obvious that women perform daily several strenuous tasks, such as fetching and carrying water, pumping water, carrying and washing laundry and utensils, baking, etc. They continue to carry on with the heavy work load in spite of their health state which is below standard due to frequent pregnancies and unbalanced diets. The majority of women, however, prefer to feed their children and husbands first, and eat the smallest share themselves. It was also observed that women rarely seek medical care. They continue to assume their responsibilities even in the hottest weather. In addition to the physical chores, women have emotional worries. They care for sick children, give medicine, feed them, and accompany them to formal or informal health practitioners.

In spite of all these responsibilities, the women rarely complain. Most village women are aware of the pressing need to improve village facilities, i.e. reliable sources of water, availability of a sewerage system, and an efficient disposal system in order to make life easier for them, but they nevertheless have neither voiced their concern nor attempted to demand a share in presenting solutions for existing problems.

It was quite obvious that the majority of women, especially in Babil, do not join in any supportive activities in relation to community development issues, nor do they feel an obligation to do so. They feel that men should act as mediators between them and the responsible bodies. Several respondents commented: *"It is enough for us to carry out the daily responsibilities."* Another woman declared: *"By nightfall I feel as if somebody is banging at my head as a result of carrying water back and forth during the day. I have no energy to do anything but sleep. Do you expect me to worry about bad conditions in the village?"*

Taking care of their families and performing their daily tasks were mentioned as first priorities for most respondents. They could not conceive of accomplishing these tasks and still finding the time to participate to community development. Respondents could not foresee how the management of their household chores, such as washing or getting rid of used water, could be related strongly to the sanitary conditions prevailing in their local environment. However, in the group discussion, women had several practical ideas for the improvement of existing environmental conditions, which will be discussed in Chapter 8.

## CHAPTER FOUR

### WATER SOURCES AND THEIR USE

In this chapter we examine the different sources of water in the villages and some of the ways in which and for which people use the water. There are different kinds of water, good for different things, and so a complex water economy exists. Each village has a public water system involving an elevated tank and pipes connecting some homes, but also public water standpipes. There are also private hand pumps, and of course the canals. Each of these sources of water has different implications for health. A further problem is the disposal of waste water and of waste in general.

The majority of villagers in the two study villages have access to piped water. A public distribution network supplies both villages either through public standpipes or house connections. Water analysis proved that some of the piped water sources were polluted during the summer months.

Hand water pumps are used only in Babil. Subsurface contamination due to the installation of some of the hand pumps close to sources of pollution was verified through laboratory analysis.

Irrigation canal water continues to be used heavily by women for washing utensils and clothes due to its soft properties in comparison to the ground water that supplies the piped and pump sources. Unlike ground water sources, canal water was found to be contaminated with faecal coliform and not suitable for domestic purposes especially drinking. Canals were not found to be infested with snails infected with bilharziasis during the two periods of analysis.

In both villages the ground water table is less than one meter below the surface, and it has risen recently due to the use of more water for irrigation and the deterioration of the drainage system. The high water table is an acute problem in both villages, but especially in Kafr Shanawan, where the level is even higher.

**Wells and Tanks.** Piped water was introduced to Babil in 1965. It is supplied by a public ground water source fed through a reservoir situated in an adjacent village one kilometer away, which supplies two other villages as well. The principal water source is drawn from a deep well (about 60 meters in depth), which presently operates with an electric pump. Water is pumped to an elevated concrete tank of 60 cubic meters in capacity. This tank was once covered a mesh

screen, but at present is covered by a wooden lid. It is equipped with an overflow outlet which discharges to a nearby drain.

The tank is supposed to be scrubbed clean once a month by operators. The rural health unit of Babil and Kafr Hamam is responsible for inspecting this source. Samples are taken monthly to be analyzed in Shebeen Laboratory for their chemical and bacteriological content. If any sample proves to be bacteriologically unsatisfactory, according to the Egyptian Standards for Drinking Water, the tank has to be scrubbed and disinfected with a chlorine compound. The health sanitarians reported that two samples proved to be contaminated in 1984. During the hot weather from May to August, following Ministry of Public Health regulations, the tank is disinfected monthly. However, the distribution system cannot be disinfected, as the fire hydrants are located in such a way that washing water from the network would flood the streets. Nevertheless, this flooding could be prevented by connecting the outlet of these hydrants to a nearby canal or drain. Another problem is a fodder factory located 30 meters from the well tube. Wastewater from this factory seeping into the area surrounding the well could be considered as a source of pollution of the well water. The output of the electric pump is 43,200 liters per hour. This source is used by about 30,000 people in three villages. Assuming an average consumption of 50 liters per capita per day and a 10% loss, the required daily amount of water is 1,650,000 liters. Operating 12 hours daily, this pump can deliver 518,400 liters, which amounts to 31% of the daily consumption. If it were operated 24 hours a day, which is hardly possible, it would deliver 1,036,800 liters. This volume still would be 27% less than the needed amount. These calculations do not take into account the water quantity used by the public services in the community.

In Kafr Shanawan the public ground water source was constructed around 1952, and like Babil is supplied by deep wells. Recently the system was renovated to improve its efficiency and capacity and it now supplies one additional village. The pumps work either by electric or diesel power, thus minimizing the chances of failure. The capacity of two electric pumps out of three available is about 115,200 liters per hour. This source serves about 25,000 people. Under the assumption of the same conditions given in Babil, the required daily consumption is about 1,375,000 liters.

Two pumps can deliver 1,382,400 liters in 12 hours. This source is reliable and water is abundant.

TABLE 6

## SOME EGYPTIAN STANDARDS FOR DRINKING WATER

Parameters	Standard
<b>Chemical Characteristics</b>	
Dissolved solids mg/l	1500
Sulfate mg/l	400
Total Hardness mg/l	500
Chloride mg/l	600
Nitrate mg/l	45
Turbidity (ground) units	25
Turbidity (surface) units	5
<b>Bacteriological Standards</b>	
Faecal Coliforms per 100 ml	must be absent

Source: Ministry of Public Health Decree, 1975

The construction of the deep wells and the elevated water tank is the same as in Babil. Sampling of the water and procedures regarding the consequences of unsatisfactory bacteriological samples also follow the same practice carried out in Babil.

**Public Standpipes.** With the introduction of piped water, four public standpipes were installed in different areas within the village cluster of Babil. Women in Babil rely heavily on standpipes for their daily consumption needs, i.e., drinking, cooking and washing,

Standpipes, although vital for daily water needs, are neglected both by the body responsible for their maintenance and upkeep and by the women users themselves. As in other villages in Egypt, the areas surrounding the standpipes are usually littered with garbage and mud from the used water.

The standpipes were established close to canals, where excess water would drain easily, and along principal roads. At present, three out of the four public standpipes continue to be used by women; although designed with multiple taps, each has only one functioning tap. All three stands are designed to allow people to fill containers, and two of the three stands have a platform and a cement

elevated area large enough for women to rest their different water containers on while filling water.

The Ministry of Housing used to be responsible for the installation, upkeep, and repair of the water source, distribution network, and the public standpipes within the village. However, in 1979 the village councils were made responsible for the village water system.

Women feel that maintaining the standpipes is the business of the "government." They say: *"The government is the one responsible for it."* One woman said: *"Look, garbage is becoming so high by the standpipes that soon it will cover them!"* Another said: *"What shall we do? We cannot go ourselves to complain to the authorities. We tell our men, but it seems nobody listens to them either. We know it is a problem, but it is beyond our capacity."*

Despite the fact that women recognize the unsatisfactory conditions existing around the standpipes, they do not feel they ought to share or participate in improving these conditions. Another young woman told us:

*"The standpipe used within my neighborhood had suddenly become very muddy, obstructing the pathway to the canal which women use for waste disposal. I persuaded the women in the neighborhood to do something about it. We formed an assembly line, around ten of us, and started to remove all the dirt surrounding the standpipe. We know it will not last long because not all women care to keep the area clean; also, because we have no waste disposal system, what do you expect us to do with the leftovers? We just dump them wherever it is convenient for us - in the canals, by the standpipe or just any place."*

In Kafr Shanawan, only one of the three established public standpipes is in operation and the demand for it is minimal. The other two standpipes were closed down because they were constructed at a great distance from any drainage source, thus causing surplus water to form stagnant pools. Furthermore, with the installation of piped water in most houses, standpipes were not needed.

Analysis of water from the standpipes indicate that the values of chemical and bacteriological parameters are within the limits of Egyptian standards except for the first sample round in Babil where bacterial count and faecal coliforms were slightly higher than the standard values (see Table 7 for detailed results).

TABLE 7

**CHEMICAL AND BACTERIOLOGICAL QUALITY OF WATER SOURCES  
BABIL AND KAFR SHANAWAN  
(SPRING AND SUMMER 1985)**

Source Parameter	Public Tank (on leaving tank)		Standpipes		Hand Pump		Canal (upstream from washing site)	
	B*	K	B	K	B	K	B	K
<b>Chemical mg/l</b>								
Dissolved solids	625-644	480-535	633-681	435-555	631-707	441-484	227-264	302-213
Sulfate	35-34	32-42	28-76	45-22	28-16	28-14	10-22	7-41
Total hardness	360-560	300-480	357-530	300-450	340-492	267-500	90-263	135-313
Chloride	135-120	90-150	128-122	95-95	135-153	107-115	35-32	79-58
Nitrate	0.04-0.52	0.08-0.6	0.05-0.17	0.12-1.2	0.36-0.04	0.12-1.0	0.03-0.07	0.12-1.3
Turbidity; units	4.7-6	7-9	6.2-5.7	7-10	2-6.3	17.3-30	23-18.7	12.5-17.5
<b>Bacteriological</b>								
Total bacterial count/ml	19,090- 1000	44-10	5000- 629	580-30	125-155	222-300	39,837- 148,600	2,670- 97,926
Faecal coliforms	0-0	18-0	7-0	0-0	45-33	0-0	8,523- 115	156- 11,175

\* B= Babil; K= Kafr Shanawan

**House Connections.** Until 1970, the only source of piped water in Babil was the public stands. Since then the construction of a water main has enabled some villagers to connect water to their houses, but without proper drainage facilities. In the area served, most of the houses are built of adobe. Thus, the installation of a tap next to the doorway with no attachment to any drain system became the predominant pattern. About half (14 households out of 27 in our sample) constructed concrete basins built below the tap, or used a bucket or tin. In both cases unclean water (sullage) is emptied manually.

According to the records of the village council (January 1986), the number of villagers asking to install water connections in their houses has increased rapidly. We estimate that approximately 100 new connections have been made since our research began.

The average cost for water connection to the houses from the main pipeline is between L.E. 120 to 150. Individual water meters are installed in houses and the average monthly cost is P.T. 25-50 per month.

House connections are more common in Kafr Shanawan. At the time of our survey, 80% already had connected piped water to their houses. In Kafr Shanawan, the water mains reach all concrete houses, which also have septic tanks for drainage. These houses also have access to multiple tap connections located in the kitchen, hall, and latrine or bathroom. Only the few adobe houses have installed one tap next to the doorway as in Babil.

The Kafr Shanawan village council representative stated that water cost for villagers is highly subsidized by the government. He also said that the public government offices within the village are not charged for water use.

Water samples were drawn from the 46 subsample households in the two villages covering different water sources and storage procedures. Water samples were taken from the tap, if available, or from a storage vessel if piped water was not installed inside the house. Analyses revealed that the chemical parameters of the water samples fall within Egyptian standardized values. On the other hand, water samples were highly contaminated with bacteria and parasites, especially those of stored water (see Tables 8 and 9).

TABLE 8

**LAB ANALYSIS OF DIFFERENT WATER SOURCES  
COLLECTED FROM THE SUBSAMPLE (46) HOUSEHOLDS  
BABIL AND KAFR SHANAWAN**

SOURCE	BABIL (MARCH 1985)		KAFR SHANAWAN (APRIL 1985)	
	Tap water	Stored water	Tap water	Stored water
PARAMETER	$\bar{X}$	$\bar{X}$	$\bar{X}$	$\bar{X}$
<u>Chemical: mg/l</u>				
Dissolved Solids	502	667	536	588
Sulfate	29	42	39	33
Total Hardness*	324	377	359	361
Chloride	125	139	90	90
Nitrate	0.11	0.05	0.02	0.02
Turbidity ;units	4.7	2.7	3.9	4.5
<u>Bacteriological:</u>				
Total Bacterial Count per ml	229408	597100	41629	89700
Faecal Coliforms per 100 ml	14	1094	1	877

\*Total Hardness: a characteristic imparted to water by salts, such as bicarbonates, sulfates, and/or chlorides of calcium and magnesium which mainly prevent lathering and causes bad taste.



TABLE 9

**LAB ANALYSIS OF WATER SAMPLES COLLECTED FROM  
THE SUBSAMPLE (46) HOUSEHOLDS  
IN BABIL AND KAFR SHANAWAN  
FOR STAPHYLOCOCCUS AUREUS AND PARASITES**

Parameter	BABIL (March 1985)				KAFR SHANAWAN (April 1985)			
	Tap water		Stored water		Tap water		Stored water	
	No.	%	No.	%	No.	%	No.	%
<b>STAPH. AUREUS:*</b>								
positive	4	50	9	60	-	-	1	11
negative	4	50	6	40	14	100	8	89
<b>PARASITES:</b>								
negative	3	39	11	73	14	100	5	5
Amoeba	2	25	1	7	-	-	3	33
Ascaris	1	12	2	13	-	-	1	11
Bilharziasis	1	12	-	-	-	-	-	-
Entrobilus	1	12	-	-	-	-	-	-
Strongyloides	-	-	1	7	-	-	-	-
<b>Total</b>	<b>8</b>	<b>100</b>	<b>15</b>	<b>100</b>	<b>14</b>	<b>100</b>	<b>9</b>	<b>100</b>

\*Staphylococcus aureus: a species which usually inhabits the upper respiratory tract and skin and may cause septic infection of wounds, burns, eye, etc.

**Hand Water Pumps.** Privately owned hand pumps are another major source for water in Babil; they are common in Egypt. The hand pumps in Babil are dug in the soil to different depths, depending on the nature of the soil. Usually a pipe is inserted until it reaches clear, unsalty water, which might be 15 to 30 meters below the surface. Often, however, they are not dug deep enough to ensure that the water is not contaminated. The average cost for the installation of a hand pump is estimated at L.E. 200. Villagers install hand water pumps either in their backyards for their private use, or in the street in front of their houses for utilization by neighbors. Repairs are attended to by pump owners.

Hand pumps are referred to by the name of the owner and location in the village. Most of the hand pumps have a cement trough for cattle watering. Twelve of the 25 hand pumps in Babil are in areas not served by piped water, so women rely on them as a major source of water.

Hand water pumps are not as popular in Kafr Shanawan as in Babil. Most of the hand pumps are installed inside the courtyards. There are only two that are situated in front of the owners' houses for public use and they are at a distance from the main residential clusters. It was observed during the fieldwork, however, that they were not used much.

People expressed their dissatisfaction with hand pumps. However, the lack of other forms of water sources and the irregularity of piped water obliges them to resort to hand pumps. One woman said:

*"Although neighbors install hand pumps in the street for villagers' use, they nevertheless remove the handle, or else do not allow us to use it for washing so as not to dirty the surrounding areas. And if for any reason we have a misunderstanding with them, they will not allow us to use it. Other times if it breaks down, they are reluctant to fix it quickly. Another fact is that we do not like to use this water for drinking, because if the water stays overnight in the container, it becomes stale."*

The areas surrounding hand pumps were in better condition than the standpipe areas. Several respondents who used hand pumps as well as standpipes in Babil commented: *"We are usually careful not to dirty the areas surrounding the hand pumps for fear of the owners, but soiling the areas surrounding the standpipes is not important, since they are government owned."*

A total of 15 hand pumps were analyzed for water quality, 12 in Babil and 3 in Kafr Shanawan. The pumps selected for analysis were either pumps used extensively, or were located next to standpipes and are used when the standpipe water is cut off. The analysis of chemical parameters indicated that the values fall within the limits of Egyptian standards. However, some of the hand pumps, which draw water from sub-surface layers, were found to be contaminated with bacteria and parasites.

**Irrigation Canals.** The canals surrounding the village are mainly for irrigation. Nevertheless, women prefer to use the canals to attend to chores that require abundant water use such as washing utensils and clothes. The canals are also used for the disposal of solid waste and sullage, as well as drainage from public standpipes. Canal water continues to tempt young boys to swim during the hot summer months.

In Babil, the Ministry of Works has installed concrete steps in eight different areas by the bank of the canal. This undoubtedly encouraged women to wash there.

Despite the fact that most houses in Kafr Shanawan have access to piped water and waterflow is regular, the canals are used heavily for the same purposes as in Babil. The canal water is softer than the piped water and therefore easier to use with soap. Also, the severe problem of the high ground water level in Kafr Shanawan and the lack of a sewerage system make the use of piped water a problem.

Water samples were obtained from all irrigation canals in both villages. Sampling sites were chosen to represent the quality of water prior to domestic use by the women and remote from any sources of pollution. Laundry sites and polluted places, due to waste disposal, were also examined to find out the impact of domestic activities on the quality of canal water, assess the public health effects of using canal water, and try to determine why women have long insisted on using canal water even where standpipes are easily accessible or adjacent to the canal. The chemical analysis revealed that the values fit the Egyptian standards for drinking water. However, canal water was found to be high in turbidity and it is highly contaminated with bacteria and parasites due to waste disposal in the canals. Thus, canal water cannot be used for drinking purposes.

### **Environmental Assessment**

The environmental assessment of the three available water sources in both villages is based on field observations and results of the laboratory analysis. As stated earlier, the piped public water sources in both villages are derived from deep wells. Water is pumped to elevated tanks from which water is distributed to the public standpipes and some houses. Our data show that the water from the public tanks does not meet these sanitary requirements (see Table 7). The looseness of the cover, the irregularity of tank cleaning, and the lack of use of disinfectants during the summer season all affect the characteristics of the stored water. For instance, the rise of total solids, volatile solids, and total bacterial count suggest the possibility of contamination of water during storage.

Chemical data reveal that the most important differences between ground sources and canal water are the total solids, dissolved solids, total hardness, and chlorides. Ground water records higher values than the canal water, even after the canal water has been used for washing and laundering. For instance, ground water values may reach three to fourfold the values of canal water. These parameters discourage the use of ground water for domestic purposes as it produces

less lather formation and hinders the proper cooking of legumes. The excess of salts in water imparts a disagreeable taste.

A comparison between values in the ground water and those given by the Egyptian Standards for Drinking Water was completed. The ground water almost meets the total hardness standard of 500 mg./l, and sometimes it reaches levels higher than the standard in both villages. The remainder of the parameters do not meet the standards for domestic uses. However, where two sources of water are available and one is softer and more dependable than the other, citizens of both villages are inclined to use the former one.

From the bacteriological and parasitological points of view, the ground sources of water are more sanitary than the canal water. All samples from ground water were almost free from faecal coliforms, *Staphylococcus aureus* bacteria, and parasites. This means that in spite of the suitability of canal water from the chemical quality point of view, it is not suitable for domestic purposes, especially drinking. In addition, the possibility of contracting certain diseases associated with surface water contact, such as bilharziasis, is always present. The sanitary survey carried out for the sites of washing and laundering along the canals revealed the absence of snails, which are vectors of bilharziasis. This may be due to the scarcity of weeds in the canals, the swift current, and the utilization of an irrigation cycle (in which the canals are empty during 10 days out of every 15) which in turn may discourage the growth of snails. The use of soap and synthetic detergents during washing and laundering may also have a molluscicidal effect. Moreover, the absence of a sewerage system connected to the canal and the general avoidance of defecation and urination in these canals would make it difficult for snails, if present, to become infected with bilharziasis.

Construction of public water sources is supervised by the health sector, which is not the case with the privately owned hand pumps. In addition, the public water sources usually draw their water from deep wells that are remote from surface contamination, whereas the privately owned pumps are shallow ones, and hence, are more subject to surface contamination.

Subsurface contamination, i.e. deep contamination, is more frequent in the private water pumps because these pumps may be constructed anywhere in the house according to the preference of the owner rather than sanitary standards. Some of these pumps are very close to sources of contamination such as latrines, solid wastes, and poultry. It is important to note that owners are unaware of the health hazards that might result from being close to contaminated sources.

The use of certain water pumps more than others for domestic purposes is governed by the palatability of the water, i.e. taste, odor, and clarity. In Babil,

there are two hand pumps 50 meters apart; one is frequently used by the neighbors, while the other is not. Analysis of water from these two pumps proved that the preferred one has less dissolved salts (594 mg/l), chlorides (130 mg/l), sulfate (24 mg/l), and turbidity (5 units) in its water than that of the other pump (804, 190, 68, and 13 respectively). These parameters cause the disagreeable taste, odor and turbidity. On the other hand, the preferred pump water has a total bacterial count of 320/ml and faecal coliform bacteria of 45/100 ml, while in the other pump the water had a total bacteria count of only 40, and was free from any faecal coliform bacteria. Therefore, although the first pump is acceptable from the chemical point of view, it is not so from the biological perspective, which is the crucial parameter.

**Disposal Systems.** Disposal of any waste material, especially septage, into the canals is strictly prohibited by Egyptian law. The disposal of septage into drains is allowed after proper treatment. The use of septage and manure as organic fertilizers is restricted to crops not to be eaten raw, and only after allowing a certain period of time to elapse. Diseases which can be transmitted through the unsanitary disposal of these wastes include viral diseases such as viral hepatitis and poliomyelitis; bacterial diseases such as typhoids, paratyphoids, and bacillary dysentery; and parasitic diseases such as ascaris and amoebic dysentery. In addition, contamination of ground water occurs through the chemical and biological contents of these waters. This is especially dangerous for the privately owned shallow hand pumps.

Like most villages in Egypt, Babil has no sewerage system. The only available system for septage evacuation is administered by the village council serving all seven villages in the area. The evacuation is done by a large truck equipped with a motor for suction, which serves Babil once every ten to fifteen days. The cost per truckload is approximately L.E. 2. Mosques, health units, and schools currently have priority for this public utility. Public facilities pay no charge for the service. Villagers residing along the main roads may obtain a similar service if time permits.

However, most of the villagers residing in the cluster area have little or no chance of using this service, and rely on the private sector. Private emptying is carried out by a few out-of-town laborers. Laborers empty septage tanks with buckets attached to long ropes. The buckets are then discharged into a donkey-drawn cart. The carts are small, and it requires ten or more cart loads before the tank is empty. The laborer then usually dumps the septage into the nearest canal or drain. The cost for each cart load may amount to L.E. 5 or more.

There is no system for solid waste or sullage collection in Babil, while in Kafr Shanawan there is a regular solid waste collection system. A large cart pulled by two mules passes daily down the main streets in the village.

Inhabitants of Babil have resorted to their own acquired system of recycling most of their waste materials. The majority use leftover food to feed poultry, and they use waste materials for fuel. Empty containers are thrown either in the canals or streets, as are dead animals, feathers, dirty water, etc. It is interesting to note here that villagers in Babil expressed the need for a sewerage system as their most pressing problem and have not stressed the problem of solid waste.

In Kafr Shanawan, on the other hand, all respondents without exception expressed the urgent need for an efficient system for the collection of dirty water from the houses. Several women said:

*"Long ago a donkey cart used to pass by the different houses to collect used water. We wish that this system could resume. We feel that at the moment this is more important than garbage collection because this is one of the main reasons that force us to wash in the canal."*

Another woman said:

*"The content of our garbage is not a problem because we use most of it. But the employed women who raise no poultry are the source of the troubles, since they get rid of all their garbage in the streets instead of the canal. Moreover, their food consumption is different: they use more canned food. Hence, they are more responsible for the accumulation of solid wastes that cause the bad odor in the streets."*

The disposed waste usually includes sullage (wash water), septage (urine and stool), solid wastes, and animal wastes (manure). Sullage and septage disposal are the most urgent problem in both villages, especially in Kafr Shanawan.

Usually the sullage is thrown into the streets, especially in Kafr Shanawan. In this village, the high ground water table causes flooding of latrines and the formation of a number of stagnant water ditches. These ditches are favorite breeding places for *Culex*, a species of mosquito which flourishes in polluted water (Feachem, 1984). It can transmit filariasis (elephantiasis) and Rift Valley fever. This species has been proven to be the arthropod vector responsible for the outbreak of Rift Valley fever in Sharkeya Governorate, Egypt, during 1977 (Bres, 1978; El-Gebaly, 1978).

The use of animal wastes (manure) in making dung cakes, which are left to dry in the open, is one of the causes of fly breeding in the two communities. Dung cake preparation is a health hazard to the women making them. They are exposed to the possibility of infection by tetanus, septic

conditions of the skin, eye diseases, gastrointestinal diseases, etc. Tetanus infection requires a break in the skin, preferably a deep puncture because it is an anaerobic bacteria.

Solid wastes are disposed of mostly in the streets, canals, fields, or burned in the oven. The first two methods, however, cause the nuisance of fly breeding and foul odors. Flies can transmit so many viral, bacterial, and parasitic diseases affecting the skin, eye, and gastrointestinal tract (see Figure 2).

### **Physical Environment**

**Streets and Alleys.** In neither village is much attention paid to the conditions of streets and alleys, either by the villagers or other responsible bodies. In the village streets, stagnant water, solid wastes, animal dung, dead animals, empty containers, and children's feces may be encountered.

There is no regular system for cleaning or sweeping streets. Occasionally a fine of L.E. 2 to 5 is collected from villagers who throw dirty water or pile manure in the streets. One respondent said, "*The street condition reflects the cleanliness of the women living in the area. Women who take the trouble to clean their houses will also clean the area in front of their door.*" Another one said, "*We usually clean our street whenever there is a wedding or funeral.*"

As Babil has no regular solid waste collection or household waste containers, the impact is reflected in the fly index shown in Table 10. This table shows the relation between the fly index outside the houses and the presence of a waste container. Streets where houses do not use containers, and where the residents throw their wastes into the streets, exhibit a far higher fly index. In Kafr Shanawan, on the other hand, the high ground water table which is responsible for stagnant water ditches, combined with the disposal of sullage into the streets, has in addition to the presence of flies, encouraged the breeding of mosquitos. The prevalence of garbage, dung, and infant feces in the streets enhances the breeding of flies.

FIGURE 2

SOLID AND SULLAGE WASTE DISPOSAL

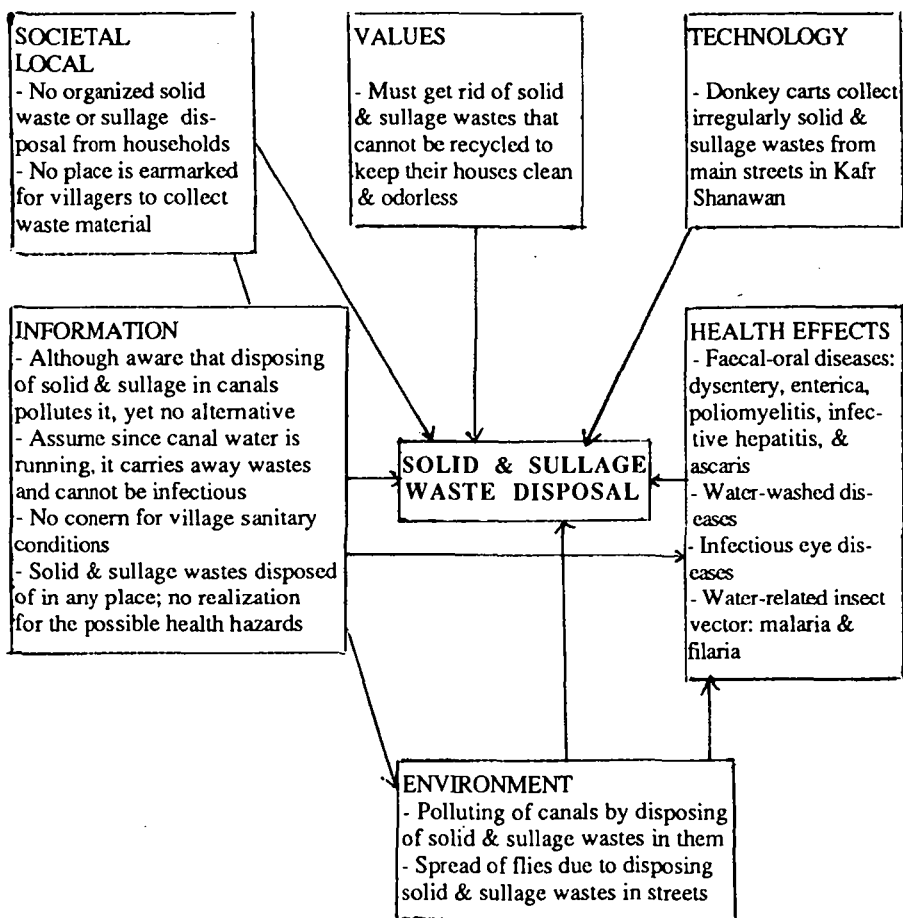




Table 10

**EFFECT OF PROVISION OF SOLID WASTE  
CONTAINERS ON THE FLY INDEX  
OUTSIDE THE HOUSES (SUBSAMPLE)**

Solid Waste Container	BABIL (March 1985)			KAFR SHANAWAN (April 1985)		
	$\bar{X}$	SD	Sample Size	$\bar{X}$	SD	Sample Size
Present	110	-	5	110	-	16
Absent	165	86	18	110	-	7
t	1.406			-		

**Stagnant Water.** Both villages have some pools of stagnant water. Babil has two stagnant areas located in the middle of the village. One is an irrigation canal that is hardly used and is dry throughout most of the year, and the other is a stagnant pool not used at all. Both are used heavily for solid waste and sillage disposal purposes.

In Kafr Shanawan stagnant water appears in different areas at different times depending on the condition of the water main and the level of the water table. Pools may also be due to the high ground water table and the disposal of sewage by infiltration through the soil from the different types of latrines. These swampy areas are located within the residential parts of the villages. Needless to say, these sites are breeding places for mosquitos, whose larvae have been recovered from one of the stagnant water ditches in Kafr Shanawan.

**Cemeteries.** In Babil, the cemetery is located in the middle of the village, whereas in Kafr Shanawan, it is 80 meters east of the residential area. Both cemeteries are located on an elevated area to avoid the high ground water table. However, these cemeteries may be one of the causes of the pollution of ground water (especially in Babil), particularly for nearby privately-owned shallow hand pumps because of the seepage of different pollutants from the decomposition of the

dead bodies. According to Egyptian law, all cemeteries should be located at least 200 meters away from residential areas and 100 meters from ground water sources.

### **Conclusion**

Results presented in this section pertaining to the existing facilities and the standard of community hygiene within the two villages indicate that they suffer from: 1) pollution of most water sources; 2) lack of maintenance of water sources, 3) lack of a proper disposal system for solid wastes and sullage, and 4) lack of a sewerage system.

## CHAPTER FIVE

# WATER AND SANITATION PRACTICES

The presentation in this chapter is based primarily on the analysis of anthropological data. We review the relative importance of each water-contact practice and the reasons why women behave as they do. These findings are a step forward in understanding the perceptions and behaviors related to the existing village environmental conditions.

In examining each pattern of behavior, an effort was made to describe precisely what women and associated members of the household do each day and how this may vary from household to household and between villages. The outcomes of their practices were seen in terms of: 1) effort and energy; 2) time and convenience; 3) health as reflected in the absence of disease; 4) environmental effects, as evidenced in the quality of air, water, and soil in and around the household. These combine to shape the productivity and health of the household.

### Domestic Hygiene

Water is necessary for the achievement of most of the daily domestic chores conducted by women. This chapter presents information on the behavioral patterns of women in handling and utilizing water for domestic needs. Their use of water includes drinking, cooking, laundering, washing of utensils, house cleaning, and watering of animals. Each domestic event related to water use will be discussed separately covering the following topics: 1) water source utilized; 2) by whom, how and in what manner water is fetched from the source; and 3) storage procedures.

Women in Babil and Kafr Shanawan are similar to those in other developing countries, in that they are the main procurers and managers of water for domestic and personal use. In each pattern of water utilization, various considerations influence the women in deciding what to do in their particular circumstances. Seven major sets of factors were taken into account: 1) the local environment of surface and ground water availability and quality, and available drainage; 2) local organization and institutions for dealing with water; 3) available technology, such as pumps and washing machines; 4) information and educational facilities to which the villagers have access; 5) the time and energy expended on various practices; 6) social values held by the women and men of the community;

and 7) perceived health effects as measured by reported mortality and prevalence of disease.

Water contact occurs on a daily basis for at least one or more women within each household. At least one type of water source (house connections, standpipes, canals, hand pumps) is at a fairly close distance to most of the inhabitants, but perhaps not the particular source they would prefer to use. Women generally do not walk more than 300 to 500 meters to reach one of three water sources within the village.

### **Drinking Water**

W.H.O. reports state that 80% of all diseases in the developing countries are related to unsafe drinking water and inadequate hygiene (Mosley, 1980; Wijk-Sijbesma, 1985).

Because the woman, as mother and housekeeper, determines the appropriate hygienic use of water, her participation is vital in efforts to halt the cycle of infection, especially for diarrhetic illnesses resulting from the faecal contamination of foods and household water (Elmendorf, 1981).

In both villages, drinking water receives the best care possible in respect to source, fetching, and storage. Most respondents stated that it is important for drinking water to be clean, their perception of cleanliness being that the water must be clear and free of odor. Villagers are usually concerned with the taste and smell of their water. Therefore, the responsibility of fetching and storing water is usually delegated to the cleanest and most energetic women within the household. In the extended family, the mother-in-law delegates the most appropriate candidate, regardless of status, for this job.

**Water Sources Used.** Most villagers prefer to use piped water for drinking. They obtain it either from the installed piped water system in the houses (29.6% of the houses in Babil and 81.5% in Kafr Shanawan have house connections) or else from the public standpipes. In Babil, a few people resort to hand pumps for their supply of water, either because they live at a distance from any pipeline, or because of the irregular delivery of water in the pipelines. The majority of respondents, however, stated that piped water is the most suitable for drinking because: 1) piped water is clean, since it is treated; 2) it is free of microbes due to the disinfectants the government adds to the water to insure its purity; 3) in spite of this, it does not develop a bad taste or odor even when stored for a long time, unlike hand pumped water; and 4) it is accessible reliably.

A small minority, mostly elderly women, persists in using canal water for drinking purposes, in spite of the availability of piped water in their houses. As one of the respondents in Kafr Shanawan stated: "*The canal water is as sweet as honey; and it quenches one's thirst unlike piped water of which no matter how much you drink, you are still thirsty. I've been drinking from the canal all my life, and as you see, I am healthy in spite of my old age.*" It is important to note that piped water supply in both villages depends on a ground water source, which is slightly salty in taste.

Most of the respondents who use the standpipe water for drinking live fairly close to these stands; hence, distance was not mentioned as a problem. On the other hand, distance is a problem for the few villagers in Babil who live in the new residential area at the outskirts of the village, and who have no piped water connections and are thus obliged to use hand pumps for their daily supply of drinking water.

Villagers in Babil expressed the following major constraints with regard to the use of standpipes for drinking water, since most of the houses do not have access to water as in Kafr Shanawan: 1) Water is obtained on a first-come-first-served basis. Women must wait their turn regardless of what purpose that water will be used for. The only exception is for elderly women who are the minority. 2) Low water pressure is common. Therefore, it takes a long time to fill the containers. 3) It takes a long time to wash the water container at the stand prior to filling it. 4) Provision of water is irregular. The water is often cut off and women waste their time waiting by the standpipes hoping that the water will shortly resume.

**By Whom, How, in What is Drinking Water Procured from its Source.** The fetching of drinking water is one of the most important daily chores for all households, except for those who have installed piped water in their houses. Hence, it is a more common chore in Babil.

Adult females or older siblings (age 15 and over) are usually responsible for both the fetching and storing of drinking water, regardless of educational level or economic status. In normal circumstances, fetching water does not exceed 20 to 30 minutes per load; and in some cases, women make several trips a day depending on their consumption needs. The preferred time for fetching water is between 9 a.m. and 12 noon. The consumption of water increases during summer months.

Almost all females in both villages use similar containers for fetching drinking water. The typical container is made of galvanized tin. It has a wide opening with no cover, and its capacity is approximately 20 to 22 liters. A few

women use a big plastic basin or an aluminum container, usually smaller in size (Figure 3). Women bend to place the container under the tap and stand in an upright position while filling.

Women generally are aware of the importance of drinking clean water, consequently they take great care to ensure minimum contamination while fetching water. The first task at the standpipe is to wash the container with soap and rice hay and to rinse it thoroughly before filling it. Moreover, women try to go at times when the standpipes are least crowded, especially with other women who are attending to their washing, in order to avoid contact with used water. They are not reluctant to express their concern and other women respect that to the extent that they may be allowed to advance their turn in filling their containers.

**Water Storage and Cooling.** Traditional water storage practices do not necessarily disappear, even when the water supply becomes more accessible. We observed in both villages that when water finally is delivered to the house, distribution and storage remain under the control of the women of the house. Regardless of whether tap water is available in the house or not, nearly all women store drinking water in one form or another. However, the reason for storage may differ. In some cases, water is stored to cool, while in other cases it is stored to insure availability when water is cut off. Others may store water for the simple reason that they do not have access to any other source at home.

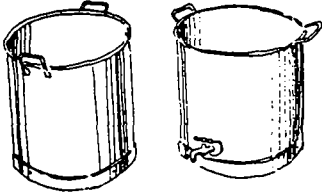
The containers used for storage of drinking water vary according to their function. Cooling containers differ in material, shape, and size. They are made of clay, glass, or plastic and are usually narrow necked, while those used for storage are larger, have a wide opening, and are made of either aluminum, zinc, galvanized tin, or copper. The same household may use more than one type for water storage. It is important to note, however, that containers used for fetching water are not used for storage.

Three popular types of containers are used for cooling drinking water:

1. *Ollah*. The *ollah*, manufactured locally out of porous clay, is one of the oldest traditional methods used for cooling water in all of rural Egypt and is used mainly during summer months. Its capacity is approximately one to two liters. It is narrow-necked, with one opening about 7 centimeters in diameter, and costs around P.T.30 each. It is fragile and is replaced immediately whenever broken.

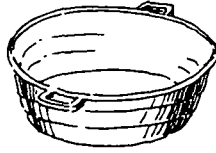
Residents of all house types in both villages use the *ollah* extensively, regardless of whether there are taps within the houses or not. Since they are small, most households own three, four or more *ollahs*, and they are refilled continuously. *Ollahs* are usually kept in the coolest and most shaded place in the house, either

FIGURE 3  
**CONTAINERS**

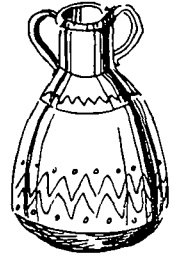


**Bastellas**

To carry water



**Plastic**

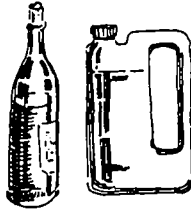


**Clay**

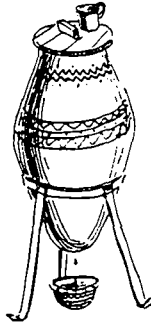


**Oullah**

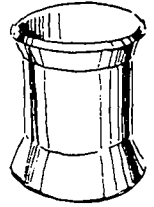
To store water



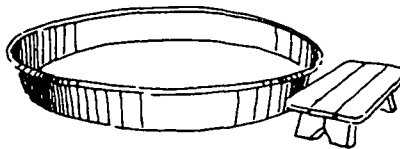
**Bottles**



**Zir**



**Aluminum**



**Basin**

For washing

Drawings by Architect Mohamed Moheeb

on the window sill or on a table in the courtyard. They are arranged on an aluminum tray, and in most cases are covered individually with plastic covers or all together with a piece of clean cloth.

It is the responsibility of the senior females within the household to look after the cleaning of the *ollahs*. From the inside they are cleaned by rinsing with a little water before refilling. Once a week, however, they are cleaned carefully from the outside by applying some red brick dust or flour, or just soap and water to clean out any growth of fungus.

*Ollahs* are used for communal drinking, and all family members, regardless of sex or age, may use the same one. People drink from the *ollah* by lifting it up to the mouth and taking one or two gulps of water.

The *ollah* is refilled directly from the tap water whenever available in the house, or from stored drinking water. The water is scooped out from the large storage container with a plastic or aluminum cup into the *ollah*.

Analysis of water samples taken from *ollahs* revealed that (from the bacteriological point of view) the water stored in *ollahs* is less contaminated than water stored in large containers. It contains no faecal coliforms. This may be attributed to the *ollah's* small capacity, which entails frequent cleaning.

**2. Bottles.** In some households, glass or plastic bottles with one or two liter capacity are used instead of the *ollah*, or both types of containers may be used at the same time. Bottles are more common in the concrete houses, since few own refrigerators (15.6% in Babil and 21.4% in Kafr Shanawan). Bottles are preferred since they are cooled in refrigerators.

As with *ollahs*, the villagers drink directly from the bottle, and it is refilled whenever empty. The bottles are cleaned from the inside with soap and water once a week. Bottles are then placed in cool spots as the *ollahs* are, or else in the refrigerator by those who have one. We noticed that most households owning refrigerators cool water in them during the summer months.

**3. The *Zir* (clay jar).** The *zir* is another traditional water cooling container used extensively all over rural Egypt. It is made of porous clay with a wide opening and comes in different sizes. In these villages, the *zir* is used less frequently than the *ollah* or the bottle. The small *zir*, with a capacity of approximately 20 liters, is more popular among villagers. On the other hand, the *zirs* are now used for cooling purposes, they now are plastered from the outside to allow for storing water (El-Sebaic, 1981). They are kept in a cool and shady area within the house, mostly in the courtyard or hall. A small *zir* can be bought for approximately L.E. 2 1/2-3.

Whenever someone wants to drink from the *zir*, the entire hand using the sole cup available is dipped into the container. They are washed in the same



manner as the *ollah*. However, they are refilled and washed less often than the *ollahs* because of their greater capacity.

**Containers Used for Storage of Drinking Water.** The containers, used as reservoirs for the storing of drinking water, are predominantly made of aluminum, either with or without a tap attachment. All containers are covered with a loose or a fitted cover. Their capacity is approximately 25-30 liters. Water is emptied from its tap into the cooling containers, and for those without a tap, a plastic or aluminum cup is used. Prices of storing containers range from approximately L.E. 4-6.

Water storage containers are placed in a variety of places around the house. Some villagers may keep them in the visitors' room, the bedroom, the yard, or in the hall close to where they attend to their cooking. The cleaning of the storage containers is mostly attended to in the house. Leftover water, soap, and a *loufa* or rice hay are used for scrubbing the inside of the containers, after which they are rinsed thoroughly with water.

Miller (1981) found that different pattern in their study of houses in some villages in the Delta and Upper Egypt. Only 2.5% of the houses had piped water installed. Also, the number of citizens per standpipe was 229, while in the current study it was found that in Babil there are 952 citizens per standpipe. This discrepancy may be attributed to the time factor, since in recent years more rural Egyptians have introduced piped water into their homes, and thus do not have to depend completely on standpipes.

For whatever reasons, water is stored in virtually all households. The effect of storing water on the different biological characteristics reveals that the total bacterial count and faecal coliforms are higher in stored water than in tap water. It is interesting to note, however, that the longer the storage time, the less the bacterial count. This finding applies to both villages. After about 24 hours, stored water begins to show the same characteristics as tap water (see Table 11). This result may be attributed to the fact that bacterial count is reduced due to sedimentation, consumption by other organisms such as protozoa, and the diminishing supply of nutrients. These results are in congruence with the study carried out by El-Attar et. al. (1982) in a Nile Delta village. These bacterial and parasitic parameters, as has been shown before, are regarded as indicators of pollution of drinking water and may cause some disease.

TABLE 11

**EFFECTS OF WATER STORAGE DURATION ON  
THE BACTERIAL AND PARASITIC CONTENTS  
OF STORED WATER (46 HOUSEHOLDS)**

		not stored	stored 6 hrs.	stored 12-23 hrs.	stored 24hrs.
<b>Kafr Shanawan</b>					
Total bacterial count:	mean	40,195	233,263	33,720	5,093
	/ml SD	42,990	36,731	53,443	2,545
Faecal Coliforms:	mean	1	2,126	504	--
	/100 ml SD	5	1,808	777	--
<b>Babil</b>					
Total bacterial count:	mean	4,728	177,382	110,067	
	/ml SD	1,943	173,311	186,088	
Faecal Coliforms:	mean	21	685	48	
	/100 ml SD	60	1,304	82	

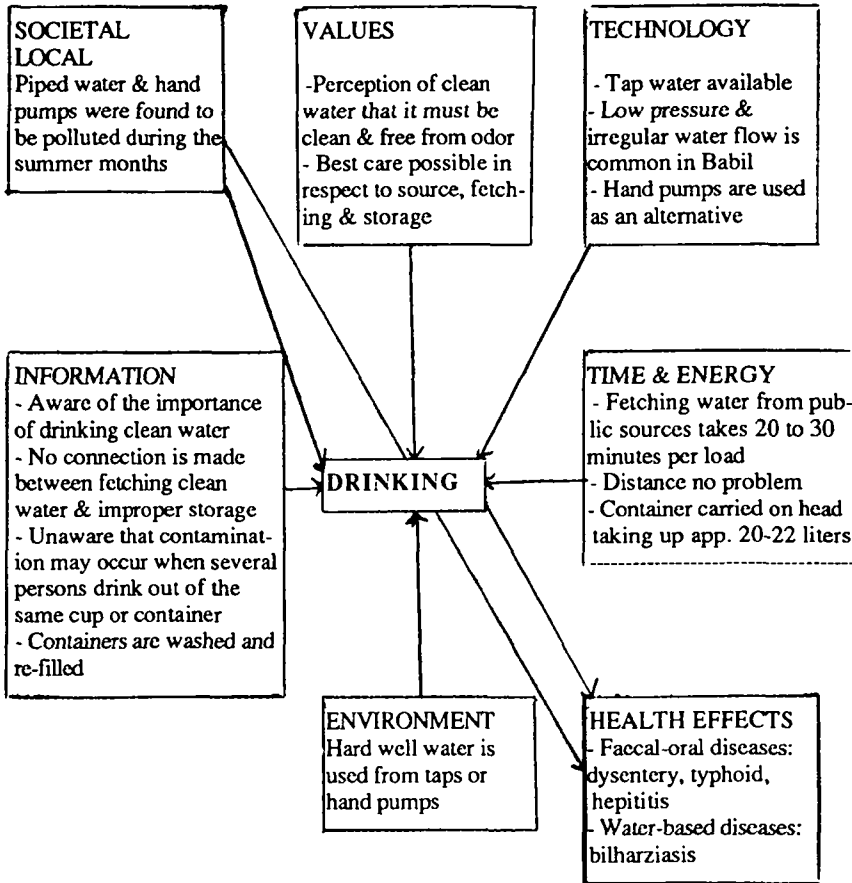
From the above, it becomes evident that patterns of water use for drinking purposes are affected by a multitude of factors all of which having a bearing on the health condition of the family as well as reflecting shared values and available technological facilities (see Figure 4).

### Laundry

Laundering is one of the most important chores of women in both villages. Mothers are obliged to teach their daughters the skill of washing clothes at a fairly early age (8 to 10 years). First, they are instructed in washing a few objects and then gradually assume more responsibility. By the time they reach the age of 15 or 16, their training is completed, and the young girls start to handle the entire family laundering. Generally, the heavy laundering is attended to by the wife or daughter-in-law, and only occasionally are the younger girls involved.

Because there are accepted standards among most women regarding the importance of producing "clean" clothes as an end result of their efforts, women take great care in washing clothes and try to maintain a good reputation among their neighbors by retaining clean and bright laundry.

FIGURE 4  
DRINKING



The women's concept of clean clothes refers to color and brightness; therefore, white articles ought to be extremely white and spotless and colored items bright and free from stains. To achieve this standard, different steps and cleaning aids are used, such as rubbing several times and using soaps (powdered or flaked at home), detergents, and other cleaning aids.

Several prominent behavioral patterns were observed in relation to laundering. Most respondents use either aluminum or copper basins of different sizes, both for washing and rinsing clothes. Most women follow the same process in washing clothes. First, the articles are washed with soap once or twice depending on their degree of dirtiness, and between each wash they are rinsed. White clothes are usually boiled separately. Boiling clothes is practiced by the majority of the women who wash at home, even when they use washing machines. Those who wash in the canal might do without the boiling process. White clothes are boiled in aluminum containers over kerosene stoves for a period of 10 to 15 minutes. Detergents and potash are usually used for brightness, while blueing is added to the last rinse.

Laundering in the majority of cases is done near one of the water sources. If at home, the washing is done either in the courtyard or in the hall of the house, and in a few cases, especially in Babil, washing is performed in the street in front of the house.

The preferred time for laundering is between 9 a.m. and 12 noon, when the sun is shining and hot, since it is very important to dry the clothes in the sun. Even if for any reason clothes are washed in the evening, they are not hung until the next morning when the sun is up. Washed clothes are hung on lines or on heaps of straw, either on the roof, in the yard, or in the street in front of the house.

The frequency of laundering varies according to the number of individuals within the household and the presence of younger children who soil their clothes more often. Fridays stand out as the most popular day for laundering in both villages, because villagers are in the habit of changing clothes - children's school clothes, husbands' and wives' clothes, and bed sheets or spreads, if any - on Thursday or Friday. Women who have younger children may wash daily, or every other day, depending on the needs of each family.

The washing process may last one-and-a-half to two hours, regardless of whether women wash at home, by the canal, or by the standpipes. Fetching the water from an outside source is an additional burden for those who wash at home.

**Water Sources Used for Laundering.** The predominant water source used for laundering in both villages is the canal, regardless of whether the women have access to piped water or not. The pattern is for women either to wash

in the canal, or else bring canal water home. Very few women in Babil use piped or pumped water for laundering.

The research findings indicated the following patterns in relation to the actual water sources used by our respondents. Of the 46 cases in the subsample, 30 wash directly in the canals (20 in Kafr Shanawan and 10 in Babil). The remaining 16 wash at home. Of these, four live in Kafr Shanawan - three live in concrete-roofed houses and one in an adobe house. The four families were found to use tap water. In Babil, 12 families wash at home and procure the water from different sources - four use tap water, three of whom live in concrete-roofed houses and one in an adobe, while the remaining eight families fetch water from an outside source (two from the standpipes, four from hand pumps, and two from the canals). These eight families live in adobe houses.

We observed that fewer women wash in the canals in Babil. This may be due to the factor of distance: canals in Babil surround the village and are close to the residential area. In fact, many of the houses are located right by the canal. Hence, it is less of a burden for the women to carry water back and forth from the canal to the house. The new residential areas, which are at the outskirts of the village far from the canals, depend mainly on hand pumps for their supply of water.

The situation is quite different in Kafr Shanawan. The main canal used for laundering is at a distance from most of the houses in the village. Thus, it is easier for women to wash directly in the canal rather than carry the water to the houses.

Another reason given by most women in Kafr Shanawan for their preference for washing in the canal is the problem of the high ground water table in the village. This causes the overflow of the septic system, which in turn forces the villages to evacuate the septic system more frequently. This emptying process is costly and difficult to manage.

The apparent preference among women in utilizing canal water for laundering has both environmental and social implications. The following reasons were given by most respondents for their persistence in using the canal for laundering:

- 1) In the canals soap suds are formed quickly and less soap is needed.
- 2) It cleans and brightens clothes faster and better.
- 3) During the summer months the water is warm; thus, there is no need to boil clothes.
- 4) Fetching water for laundering is one of the toughest and most time-consuming tasks, as it entails the carrying of water several times in a row besides going back to the canal to get rid of the used water. Used water is either thrown back into the same canal, or else thrown into the street or a nearby alley. The latter act undoubtedly bothers

most of the neighbors. 5) When washing at home, several containers are needed: one for washing, one for rinsing, one for holding clean water, and another for dirty water. Also, the washing occupies a great deal of space in the house, while washing at the canal requires only one basin for all purposes. 6) Washing by the canal saves time, since the whole job can be undertaken at once and in the same place, washing several times and rinsing. 7) By washing in the canal, houses stay clean, and fewer containers and less soap is consumed. 8) The work load seems lighter while at the canal because the women have a chance to socialize with one another while working, especially in the summer months when their daughters, who are on vacation, assume more responsibility at home.

The following quotations may exemplify some of the women's opinions:

*"I prefer to wash in the canal because it is less strenuous. If I wash at home, I'll have to walk back and forth at least four times carrying the clean and dirty water, especially since I have no water at home."*

*"Thank God I have a water connection at home. nevertheless, I prefer to wash in the canal so as not to dirty my house, since the septic tank we have is small. Therefore, I don't want it overflowing at short intervals."*

*"Canal water washes a hundred times better than piped water; since it is always running, it is never cut off and thus is abundant. It makes soap suds easily, while the process of rinsing is much easier due to the abundance of water."*

On the other hand, a few women in both villages expressed their reluctance to wash clothes in the canals for the following reasons: 1) Some have younger children and cannot find someone to babysit while they are at the canal. 2) Some husbands, especially the educated ones, do not allow their wives to wash at the canals. If the husband holds a prominent position, he feels that because of his social or economic standing it is improper for his wife to use the canal. 3) If the woman is an employee, she may feel that it is against her professional standing to be seen using the canal for washing. 4) It is too tiresome for elderly women to wash in the canal. 5) Those living at a distance from canals prefer utilizing other water sources that are closer to their homes, i.e. hand pumps, standpipes, or taps within the house.

Some of the women who are not allowed (by their husbands) to wash at canals still believe in using canals, and in most cases hire help to wash certain objects such as sofa covers and carpets, which need plenty of running water. The same principle could be applied to the washing of utensils.

Some school girls are reluctant to wash in canals, since they have learned at school about the pollution of canals and the consequent risk of contracting disease, especially bilharziasis. Nevertheless, they are obliged to obey

their elders. When a girl's mother tells her to go to the canal, she cannot disobey, especially if there is no feasible alternative. Moreover, most of the girls consider going to the canal as an outlet in that it gives them a chance to get out of the house and socialize with friends.

**Washing Procedures in the Canal.** Women washing clothes try to cluster together at a distance from those washing utensils. In Kafr Shanawan there are about three washing areas, while in Babil each of the three canals has three or more washing areas. Stairs leading down to the canal are found in most canals, thus facilitating washing while standing. Some women may sit by the banks and wash, while others submerge their feet in the water to attend to their washing and rinsing. The majority prefer to stand on a stone or the stairs in the canal while washing.

Analysis of the canal water and of the ground water sources for both piped and hand pumps confirmed some of the reasons mentioned by the respondents for preferring canal water for their washing.

The different sources of water used for domestic purposes in Babil and Kafr Shanawan are shown in Table 7. The most striking feature observed in both villages is that around half the water used for laundering (47.6% in Babil and 52% in Kafr Shanawan) and washing utensils (45.6% in Babil and 64% in Kafr Shanawan) is derived from canals. Water used for other purposes comes from piped water or hand pumps, both of which use ground sources. This behavior may be explained by the fact that canal water is much softer (total hardness is 80 mg./l) than that of tap water (total hardness is 340 mg./l, Table 7). Especially during the summer, the tap water is harder than the official Egyptian standard (560 mg/l. rather than 500 mg/l.). Hence, women may be justified in washing with canal water.

In conclusion, women's justification for resorting to the use of the canal water for laundering explicitly revolved around the following factors: 1) better quality due to its softness; 2) an abundant quantity for both washing and rinsing, which require plenty of water; 3) it is available at all times and free of charge; and 4) washing at the canal is less time consuming, since it reduces trips back and forth (see Figure 5).

**Washing Machines Used for Laundering.** A total of 64.4% of the households in Babil and 58.6% in Kafr Shanawan own washing machines, but they are not used for the entire process of laundering. Women believe that washing machines cannot clean the rural dirt. Prior to machine washing, women wash by hand at least one turn, either in the canal or at home, after which the clothes are

washed in the washing machine, and then removed and boiled before the last rinse. It is evident that this procedure adds more work to the washing process, instead of simplifying it. Another drawback, especially in Babil, is that electricity is cut off often, thus minimizing the efficiency of a washing machine.

In spite of the fact that electric current is cut off quite often in Babil, a higher percentage of the households there own washing machines. This may be due to the fact that more people in Kafr Shanawan depend on canals for washing, because of the higher water table, which limits, to some extent, the use of washing machines because of the surplus water problem. Washing machines, therefore, are regarded merely as a status symbol rather than technology to facilitate the washing procedure.

### **Cleaning the House**

The mode of cleaning the house floors relates closely to the type of house. Those who reside in the red brick houses use water in house cleaning since their floors are tiled or are plastered with washable material. Those living in adobe houses use hardly any water for cleaning, since they have dirt floors. Another important factor which limits the use of water is the fact that water may destroy the walls that are built with no foundation, and that the use of water may add to the humidity that already exists in the adobe houses. Occasionally, however, some water may be sprinkled to hold down the dust prior to the daily sweeping.

Most people clean the floor with water alone, but some add detergents to the water. An old cloth is used in scrubbing the floor and the same cloth is squeezed and used again to dry the floor. An old container is put aside just for cleaning the floor. Women bend down completely while washing the floors. Their hands are in constant contact with both the cloth and the floor.

There is no preference as to the source of water used for cleaning the floors. The majority use any leftover water that is at hand, i.e. water may be used more than once in the house. House cleaning is done on a weekly basis, but sweeping the floor (yard and visitors' room) is carried out daily. Several respondents in both villages mentioned that they use insecticides to fight the spread of mosquitos and flies in their homes.

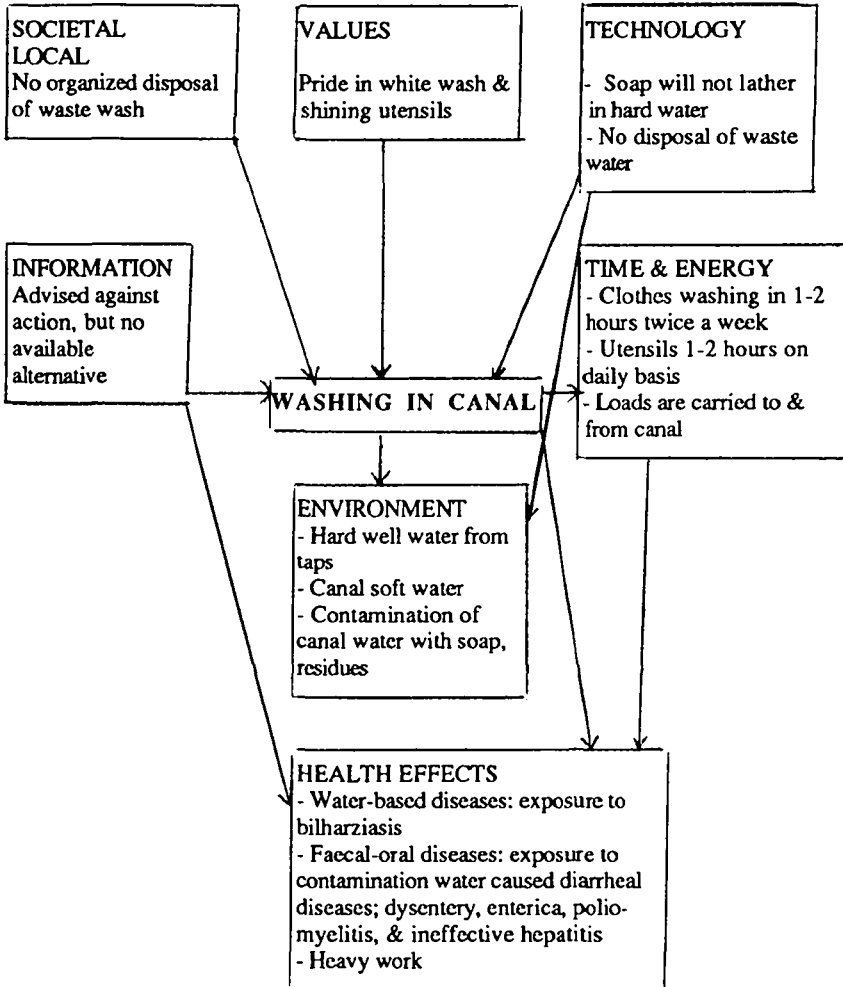
### **Livestock in Relation to Domestic Hygiene**

Livestock and poultry are highly valued in rural Egypt since they are essential both for income and for household consumption (Tables 12 and 13). Poultry was raised by 79% of the sample; types included chicken, ducks, geese, and pigeons. Livestock included water buffalo, cows, donkeys, goats, sheep, and



FIGURE 5

UTENSIL & CLOTHES WASHING



rabbits; 53% of the sample households had a *zareeba* or stable. However, most households raise these animals on a small scale, in part because of the high cost of feeding them. Poultry is nearly as common in red brick houses as in adobe houses, but *zareebas* are considerably more common in adobe houses. One reason for this difference is that red brick houses have raised foundations, which makes it difficult for animals to enter. Thus they often have a separate room with an independent entrance for large animals.

One respondent said that "*Cattle are like children; they need to be looked after. Therefore, we take very good care of them just as if they were our own children.*"

TABLE 12

**Percentage of Poultry Raisers (N=312)**

House type	K.S.	Babil	Total
Adobe	76.9	84.8	82.6
Red brick	69.9	86.9	75.9
Total	71.7	85.6	78.8

TABLE 13

**Percentage of *Zareebas* by House Type (N=312)**

House type	K.S.	Babil	Total
Adobe	59	77.3	72.5
Red Brick	26.5	60.7	38.5
Total	34.9	71.3	53.3

**Water Use for Poultry and Cattle Watering.** Water usage for poultry and cattle raising at home is limited to animal watering and the cleaning of utensils used for cattle feeding. Elderly females within the household are usually responsible for this task, since handling of water for livestock raising requires greater care.

Water coming from any source can be used if the containers are clean. Cattle are taken outside at least once a day to be watered, either in the canal, or at the water pump where a trough is constructed for this purpose. Hence, water consumption at home is minimal. However, the basin needs to be refilled daily. Water is also set out for the poultry every day; a container is put in a corner of the house where the chickens can easily reach it.

All leftover water and food are emptied from the containers. The containers are then rinsed thoroughly with the available water, regardless of the source. Soap or detergents are not used for fear that they may harm the cattle. In preparing the food, women are careful and watchful to remove straws or other objects that might cause cattle to choke.

Cattle bathing, which is limited to summer months, is a man's chore. Cattle are taken down to the canal to be washed and cleaned.

### **Cleaning the *Zareeba***

The *zareeba*, or stable, in an adobe house is a room within the house with an entrance door opening into the inner space of the courtyard. Ordinarily, *zareebas* are very poorly ventilated through a high open window not larger than 50 cm by 50 cm. However, not all *zareebas* have such an opening. Because *zareebas* have no separate entrance, animals and people come and go by the same door. The house *zareebas* are used mostly in the winter; in summer, livestock is kept in a shed in the fields.

Cleaning the *zareebas* takes first priority over all house tasks. Women attend to this task, which includes removing the dung for later use in dung cakes and replacing dirt wet with animal urine with dry dirt. Wet dirt is usually piled up in a corner of the *zareeba* until it accumulates, and then every three or four days it is carried to the fields to be used as fertilizer. Women are also responsible for cleaning the feeding and watering containers as mentioned previously. Men, on the other hand, share the responsibility of loading and transporting the natural manure (wet dirt) to the fields.

Men share with women the responsibilities of grazing, watering and washing of animals.

## **Poultry Raising**

The majority of households in both villages raise poultry for the following reasons: 1) almost all poultry eat leftover food besides grain; they are not a financial burden; 2) poultry raising is an income-generating activity especially for the women who use the extra money to buy personal items; 3) poultry is the main protein dish that villagers depend on; moreover, the consumption of eggs is quite common.

Poultry are kept on the roofs or are left to wander around the house. Pigeons are kept in the courtyard in old clay jars or tin cans hanging from the ceilings.

Adolescent girls are trained to care for the poultry, as it requires little skill. They supply the poultry with clean water, leftover foods and occasionally sweep out the unused dirt. Pigeon manure, however, is sometimes used for fertilizing.

## **The Making and Storing of Dung Cakes**

The processing of animal dung for fuel whether for household use or for marketing is widely practiced among rural women in Egypt. The situation is similar in the two villages. This chore is carried out by the women, while young girls are rarely asked to help. Findings of the sample survey indicate that in Babil 50% make dung cakes at home, 40% buy them, while 10% do not use them at all. In Kafr Shanawan, on the other hand, 29% make dung cakes at home, 62.5% buy them, while 8.5% do not use them.

Dung cakes are made mainly from cattle dung mixed with straw and water. The mixture is patted into flat round shapes nearly 50 cm. in diameter, after which they are left on the roof or in front of the house to dry. Most dung cakes are processed during the summer months, since they require strong sun for drying. Once they are dry, they are stored on the roofs for use whenever needed.

Dung cakes are used mainly for oven fuel while baking. People believe that proper baking requires them. They do not produce smoke like other fuels; their fire is strong and stable and lasts longer; and at the same time they are less expensive than other fuels.

All families who own cattle process dung cakes while others buy them for P.T. 5 to 10. Making dung cakes is the responsibility of all the women within the household, regardless of status of educational background. One respondent said, *"I know of a secondary school teacher who wakes up early in the morning and makes dung cakes before she goes to school."* Another woman commented, *"The*

*well-bred girl who was nursed by her mother should not resent helping with the processing of dung cakes.*" The few who refused to help are considered disobedient.

Several of the young school girls expressed their disgust at the idea of making dung cakes. They said this is something they do not want to learn at all.

The presence of cattle, sheep, and poultry inside the house could be associated with some of the health hazards prevalent among household members. The relation between the presence of a separate room for animals and the fly index is illustrated in the case of Kafr Shanawan. Houses which had a separate room for animals were found to have a fly index of 163/sq.m. as compared to the high index of 232/ sq.m. found in houses that had no such arrangements. The close contact with animals exposes peasants to the hazards of infection with zoonotic diseases, e.g. tetanus, tuberculosis, and gastroenteritis.

The mode of transmission of these diseases may be through inhalation (air borne and droplet infections), especially during the cleaning of the *zareeba* where the dirt, laden with causative agents, is blown into the air. Moreover, the practice of making dung cakes from manure may facilitate transmission of tetanus, as well as infections transmitted through direct contact, such as eye and hand infections. If the woman does not wash adequately after the cleaning, her hands can spread fecal organisms.

Data indicate that water containers placed close to where birds or mammals are kept record a higher total bacterial count and faecal coliforms than those placed away from animals or poultry. This is especially true if the container is not covered, or if water is drawn by dipping the cup into the water. This cup is usually placed where birds come in contact with it or where their droppings may fall on the cup.

In Babil and Kafr Shanawan, houses maintaining a separate room for animals show a lower tendency toward some disease transmission than other households raising animals in the same house. Respiratory, gastrointestinal, eye, and other febrile diseases are especially higher in the latter houses. These associations may be explained by the fact that animals and poultry are reservoirs for many causative agents for zoonotic diseases. Close contact and sharing houses with animals and poultry enhances the transmission of these causative agents responsible for many diseases, such as respiratory and gastrointestinal diseases.

### **Latrines**

According to Feachem (1983), "A clean water supply close to the home and a hygienic toilet are believed to be among the cornerstones of the environmental and social change that produced the dramatic decline in infectious

disease in Europe and North America over the past 130 years." Feachem also stressed that excreta disposal is the most important area that needs to be improved, since it has a direct effect on the mechanism of disease transmission. Within this framework, it is essential to consider the manner of excreta disposal practiced in the studied villages.

In both villages, over 90% of all houses contain some type of latrine. New houses have installed latrines as part of the house design, while several adobe houses built without latrines had them installed at a later date. A few adobe houses, however, remain without latrines.

The fact that most houses have latrines does not imply that all the family members use it. Observations of the habits related to the use of latrines indicate that these habits are affected by the age and sex of the individual, as well as the type of houses they live in.

**Location, Use, and Condition of Latrines According to Type of House.** The material used in house construction, whether adobe or red brick affects to a great extent the location, use, and the type of latrine .

**Adobe Houses.** In the adobe houses, latrines are used mainly by women, although some prefer to defecate on the roof. Home facilities being inadequate, men are more inclined to use the facilities at the mosque. Most pre-school children, regardless of their sex, are instructed to defecate in the street. Latrines in the adobe houses are located in the inner section of the courtyard below the staircase going up to the roof. A loose small wooden door opens into a dark, unventilated room approximately 150 by 150 cms. in size. The latrine opening is around 30 cms. in diameter, and it is located in the middle of the room; the opening may be round, triangular, or oval. On each side of the opening one brick is placed, upon which the feet are rested while squatting, since the squatting position is the predominant manner for defecation. The floor of the latrine is usually plastered with cement. A tin container full of water is placed either inside or by the door of the latrine for rinsing after defecation.

Women are responsible for cleaning the latrines, which are cleaned once a week or every other week. Little water is used in cleaning the area surrounding the hole of the latrine. Two reasons were stated for the minimum use of water: 1) to avoid overflowing, since the disposal system is not efficient - there is no drainage, so it is not possible to absorb more than a very small amount of water; and 2) to avoid disruption of the mud walls which might be affected by the seepage of water.

It was observed that the general hygienic standards of the latrines in the adobe houses are extremely poor. For instance, latrine openings are left uncovered allowing bad odor to infiltrate most of the house. In addition, latrines are poorly lit, unventilated and swarming with flies and mosquitos. Generally, the upkeep is very poor. It was observed that compared with other parts of the house, people were least concerned about the standard of upkeep and cleanliness in the latrines.

### **Red Brick Houses with Concrete and Wooden Roofs.**

Women continue to be the main users of the latrines. However, men are more inclined to use their home facilities than the mosque. Some families may instruct their children to use the latrine, yet defecating in the streets continues to be the main practice, regardless of the type of house. Latrines in concrete houses are similar to adobe houses with few exceptions. Concrete houses have an improved disposal system. Latrines are ordinarily situated in the rear end of the house. Their size is similar to the latrines in the adobe houses; yet they have a well-fitted wooden door and better ventilation through a small high window. Whenever piped water is connected to the house, a water faucet is placed in the latrines at a lower height (30 cms.).

A latrine is included in the house plan upon construction. The latrines are placed at a distance from the bedrooms on the southern side of the house. The explanation given by most respondents for this choice was that once the latrine is in the southern section of the house, bad odors will not reach the bedrooms in the northern side. Observation, on the other hand, shows that the odor of latrines spreads through the entire house.

The slab surrounding the holes of the latrine is usually tiled. The slabs, made of cement-based tiles, are bought in the village or any close-by town. Each slab costs between L.E. 25-35. A few respondents living in the concrete-roofed houses have an additional flush toilet, which is used mainly by visitors.

The majority of women clean the latrines once a week. As in the case with adobe houses, water is used with caution to avoid overflowing of the latrines. Only a few women use disinfectants, brushes, soap, or kerosene in cleaning the latrines.

It was observed that although the condition of the latrines in the concrete house is slightly better, yet they rate below hygienic standards. This is mainly due to the fact that the concept of cleanliness for village women, regardless of the type of house, is almost the same.

It is obvious that the latrines have lowest priority with regard to upkeep and cleanliness. This, however, does not rule out the fact that women are often

subject to environmental constraints, such as lack of a disposal system, dirt floors, and limitation in water use.

The common type of latrine present in the two villages is a pit latrine -- 43.4% in red brick and 27% in adobe houses in Babil, and 62.3% in red brick and 62.6% in adobe houses in Kafr Shanawan. The different types of latrines found in the two villages have some advantages and some disadvantages. The following is a brief discussion of the most common of the most common types found.

The pit latrine is a hand-dug rectangular or circular hole in the ground found mostly in adobe houses. The walls of the hole are lined with red brick and is covered with a slab (latrine seat, placed directly over the pit). Liquids are penetrated out of the latrine pit to the ground water. After long usage, the solid contents of the latrine have to be emptied. Some of the advantages of the pit latrine are that they are simple, cheap, practical, and easy to construct in the soil of the Delta region. Moreover, the solid contents can be utilized as manure. On the other hand, some of the drawbacks are that pit latrines are odorous, attract flies, and contaminate the ground water, especially in places where the water table is high.

The second type of latrines is a septic tank with a trench. It consists of a watertight septic tank connected to a trench of concrete walls with a bottom that allows for seepage of liquids. The solid particles precipitated into the septic tank after long usage are evacuated. This type has the merit of being usable for longer durations before requiring evacuation, but it is more expensive than the pit latrine. Moreover, septic tanks and trenches may also contaminate the ground water.

The least used type of latrine is large-sized septic tank consisting of three interconnected compartments leading to a cesspool where the liquids penetrate the soil. It is the type commonly used in schools and mosques. It has some advantages in that it can accommodate larger volumes of waste water and solids. It is less frequent than the previous types. The main disadvantage is its prohibitive high cost.

Another type of latrine is a barrel placed in a pit dug in the ground. This type has to be evacuated more frequently due to its small capacity; but it is the cheapest type of latrine and contamination of ground water is less likely to occur. Its main disadvantage is that it is highly odorous which discourages regular use. Furthermore, due to its small capacity, cleansing by water is not feasible and only adds to the offensive odor and attracts more flies (see Figure 6).

### **Personal Hygiene**

Personal hygiene is an important factor in the transmission of water-related diseases. Intestinal infections are usually related to low levels of



personal hygiene and environmental sanitation. Moreover, social factors such as housing, crowding and personal hygiene are important factors which facilitate the transfer of agents.

Within the framework of this study, it is important to give an account of the behavioral patterns of rural women and their concepts of personal hygiene.

Women's hygienic standards and cleanliness are influenced by the teachings of Islam. Purification is observed mainly as a religious function and one must be clean in order to pray. Women's purification consists of ablution - that is washing of hands, face, mouth, ears, and feet with water before prayers, and taking a complete bath after sexual intercourse, menstruation and childbirth. Hence, purification is observed daily by those who pray. The use of soap is not a requirement for ablution.

**Hand Washing.** Hand washing is one of the important practices that reflect the standard of personal hygiene. We observed during the intensive study of 10 cases that most women did not wash their hands as a regular practice in everyday life.

Soap, although found in most households (by the sink in the concrete houses, or by the water container in the adobe houses), was scarcely used. The bar of soap generally looked dry and unused.

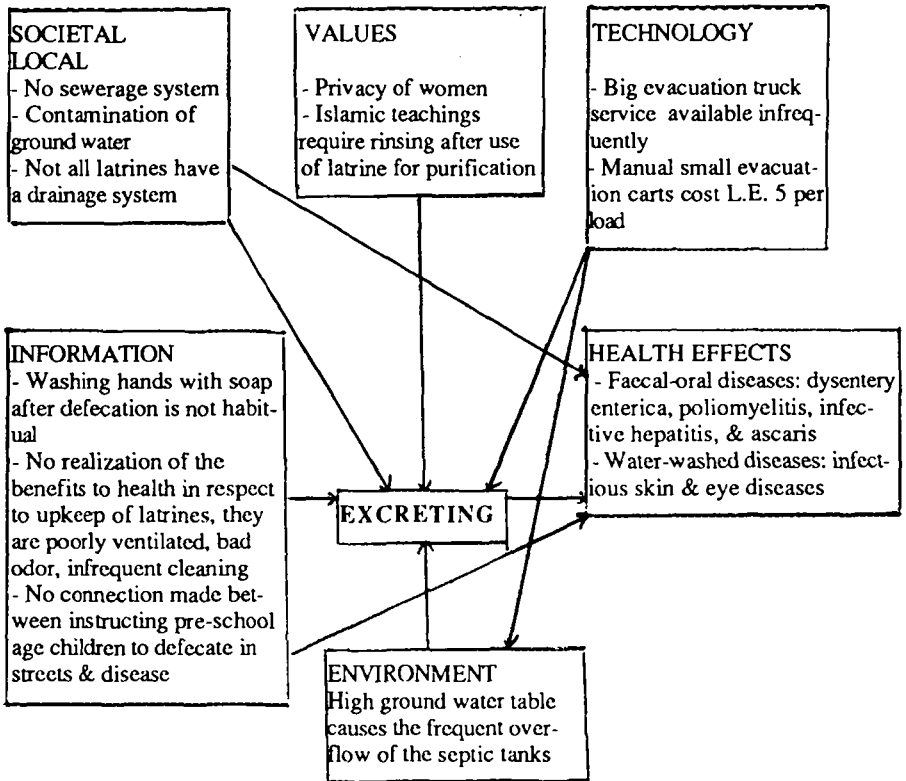
Some women, however, pointed out that washing hands with soap is essential in the following situations: 1) after handling things with a strong odor, e.g. fish, kerosene; 2) before preparing the dough for baking and before attending to dairy chores; 3) after defecation; 4) after cleaning the *zareeba* (this was mentioned by very few women); 5) after eating any food that is greasy, but seldom before eating it. The majority, however, stated that washing hands with water only is sufficient prior to food preparation.

**Hand Washing with Regard to Infant Care.** It was observed and reported by most respondents that washing hands with soap is not a common practice before breastfeeding or preparing the food for infants. One woman said: *"My breast is clean since it is covered. I pull out my breast to nurse the baby without touching the nipple. I may just rub my hands on my clothes, or wash them with a little water after working in the house."* Similar behavior was observed when preparing the bottle or supplement foods for infants.

When infants defecate, mothers change their underpants and neglect to wash their hands before resuming house work.

There is a direct relationship between failing to wash one's hands before and/or after performing certain activities and disease transmission. An example would be the link between food handling and defecation, on the one hand, and the

FIGURE 6  
EXCRETING



prevalence of eye and gastrointestinal diseases, on the other hand. The mode of transmission may be direct contact or through faecal-oral routes.

**Ablution and Bathing.** Clean water must be used for ablution and must be kept in a clean container as well. Women refrain from soiling their clothes after ablution in preparation for prayer.

It was observed in both villages that older peasant women observe prayer regularly. One woman commented: *"It is hard to keep pure if you are looking after infants, and they keep wetting themselves while we carry them and get us dirty. Thus, we start to pray regularly only after the children grow up."*

Women stated that they usually bathe for two reasons: 1) for general cleanliness; they bathe once or twice a week, soap is used, and the hair is washed too (elderly women do not bathe as often); or 2) for purification; soap is not used, but the body and hair are rinsed.

Women living in adobe houses either bathe in their bedrooms or in the storage room, while those living in concrete houses may use the latrines or the bathroom. A big copper or aluminum basin is used. While bathing, the women may stand or sit in the basin and a small container is used for pouring the water. Hot water is used in winter only.

Women wash their faces with water only in the morning or after they have completed their house work. They are careful, however, not to have any offensive body odor, and upon marriage, extra body hair is removed regularly.

One respondent said, *"It is only when I bathe and change my clothes after a strenuous day's work that I feel relaxed and ready to face another hectic day. Taking a bath takes away all the tiredness of the day."*

Bathing is one of the requisites for good personal hygiene. Also, it is one of the religious rites in Islam. Its importance lies in the washing of dirt off the entire skin surface, thus minimizing water-washed diseases, such as infectious skin and eye diseases and particularly parasitic diseases (Feachem, 1984). Water quantity, rather than quality, is of prime importance in removing skin dirt. This effect is aided by scrubbing the skin with the loufa, and by frequent bathing. "Frequent" here means that, taking into account the regularity of the water supply, a bath twice a week in summer and once a week in winter is a minimum requirement (see Figure 7).

**Women's Attire.** It was observed that the majority of women are well groomed and neat, particularly when they go out. However, they neglect their appearance while they attend to their daily chores, both in or out of the house. Ordinarily, they wear their old clothes while working and tend to change

underclothes every other day or twice a week. Women generally wear long, loose dresses, and they always cover their hair when they are out of the house.

One woman commented: *"Nowadays we are more concerned with what we wear and how we look. We have learned a great deal from watching T.V. programs. We realize now the importance of good grooming and personal cleanliness."*

It is interesting to note that from 1969 to 1971, a member of the research team was involved in another research project in Kafr Shanawan, and her observation confirms the trend for the improvement in women's attire. This is apparent in respect to their general appearance and in the choice of clothes. Young women nowadays wear colorful clothes instead of the dark ones that they used to wear outside the house.

Some of the factors that lead to the changing attitudes regarding personal appearance could be summed up in the following points: 1) watching T.V. had a direct effect on women's desire for improving self-image; 2) male laborers who migrated to Arab states brought for their wives a variety of colorful material and night gowns; 3) men who are influenced by T.V. programs expect their wives to look neat and well dressed always; 4) peasant women strive to imitate employed village women who are more careful about their attire.

It was observed that females of marital age and married women are concerned with their general appearance, since good grooming is used as a means to attract suitable suitors, while after marriage it is used to retain the interest of the husband.

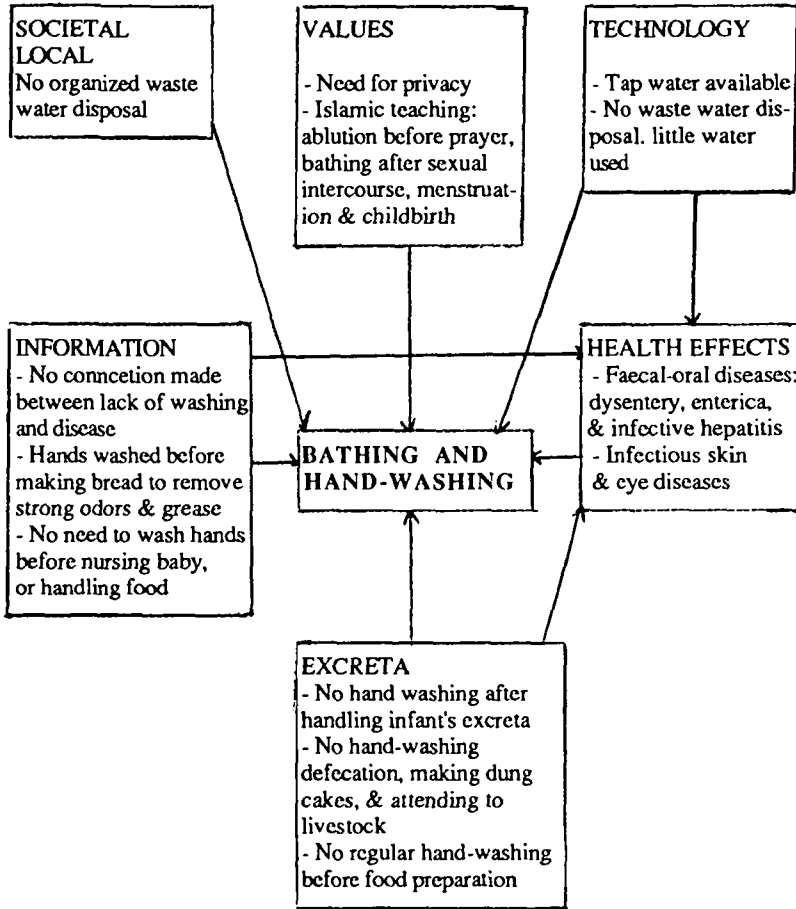
Observation and respondents' reactions emphasized that peasant women in both villages are aware of the importance of personal hygiene, neat appearance, and proper attire in fulfilling their marital obligations. They try to maintain these standards, although they may find it difficult to look proper or neat due to their heavy work load and the constraints of the surrounding environmental conditions.

## **Conclusion**

A summary of the findings is described in this chapter (see Table 14) regarding the behavioral patterns of water utilization and the sources predominantly used for the different daily functions. Patterns of water use are generally similar in both villages under study, as well as the mode of water contact of women, men, and children.

FIGURE 7

BATHING AND HAND-WASHING



The detailed description presented in this chapter covers behavioral factors which intervene between knowledge and action. The relative importance of each water contact practice and sanitation procedure was specified, as well as an account of why, where and when people behave as they do. It is evident from the findings that women's behavior is based on their interaction with environmental and sociocultural variables that are the end products of the existing sanitary conditions. That is, preference of water source affects and is affected by availability, house type, personal hygienic standards, waste disposal system, food preparation, child care, etc.

In accordance with the findings of other social studies regarding water use (White, 1972; Elmendorf, 1982; Roark, 1984), the Egyptian situation confirms that women play key roles in water use and management.

The preceding findings support the evidence that behavioral patterns of respondents in both villages, as related to water utilization for domestic demands, revolve around the available water sources within the villages, and are determined by the existing environmental constraints.

Similar to the findings of other studies, "women in their choices of water sources, make reasonable decisions based on their own criteria of access, time, effort, water quality, quantity and reliability" (Wijk-Sijbesma, 1985). In both villages, almost all water contact procedures applied for domestic use are sustained by careful and rational decisions. Women adapt according to the perceptions they have acquired, either through the socialization process, or by adjusting their behavior to be in harmony with the prevailing surrounding environmental conditions and possibilities.

TABLE 14

**SUMMARY OF FINDINGS INDICATING WATER  
CONTACT AND PERSONAL USE ACCORDING  
TO SEX AND AGE IN BOTH VILLAGES**

Application Task	Water Source	FREQUENCY/USAGE		
		Females 15-above	Males 15-above	Children
<b>Domestic Use</b> Drinking	pipd*/pump	daily/fetch- store-use	use only	use only
Food preparation	pipd/pump/ canal	daily/fetch- store-use	use only	use only
Washing utensils	canal/piped/ pump	daily/majority at source	-	-
Livestock watering	canal/piped	daily/change water	-	-
Washing cattle	canal	-	during summer	-
Laundring	canal/piped/ pump	often majority at source	-	-
House cleaning	any water	weekly if floor tiled or cemented	-	-
Cleaning water containers	pipd/pump	often majority at home	-	-
Getting rid of used water	canal/street	daily	-	-

TABLE 14 (continued)

Application Task	Water Source	FREQUENCY/USAGE		
		Females 15-above	Males 15-above	Children
<b>Personal Hygiene</b>				
Ablution	pipd/pump/ canal	older women 5 times a day	5 times a day mostly in mosque	13 and boys in mosque
Bathing	pipd/pump/ canal	once or twice a week with soap	did not research frequency at home or mosque	once or twice a week or in canal during summer
<b>Hand Washing Before</b>				
Cooking	pipd/pump	irregularly	-	rarely
Feeding infants	pipd/pump	irregularly	-	-
Eating	pipd/pump	irregularly	more regular- ly than women	rarely
Processing data products	pipd/pump	regularly	-	-
<b>Hand Washing After</b>				
Defecation	pipd/pump	irregularly may use soap	did not research	rarely
Making dung cakes	pipd/pump	regularly	-	-



TABLE 14 (continued)

Application Task	Water Source	FREQUENCY/USAGE		
		Females 15-above	Males 15-above	Children
<b>Hand Washing After:</b>				
Eating greasy food	piped/pump	regularly with soap	regularly with soap	regularly with soap
Handling items with bad odor	piped/pump	regularly with soap	regularly with soap	regularly with soap
Cleaning <i>zareeba</i>	piped/pump	irregularly	-	-

\* Water sources used are ranked in descending order

## CHAPTER SIX

### FOOD PREPARATION, UTENSIL WASHING, AND STORAGE PROCEDURES

Food handling and eating habits constitute an important component of the health status of the individual. Improper food handling affects the transmission of diseases such as diarrhea and worm infections.

The material presented in this chapter is based on the anthropological data and covers the following: food preparation, utensil washing, fuel used for cooking and baking, storage, mode of eating and improper food sanitation practices.

Food preparation is an important daily task performed by women in both villages. One of the important capabilities women strive to attain is the skill of cooking, since the ability to prepare tasty food is one of the traits of a clever wife.

In both villages, the majority of women cook one meal a day, either at noon or in the evening which is more common. Cooking is not time consuming, since daily meals constitute one or two varieties of food at most. On Thursdays and Fridays, more food varieties may be included, especially proteins such as meat, fish or poultry.

In a study out in Babil by Assaad and El-Katsh (1981), the following information on villagers' diet was reported: "Regardless of age, sex, or educational status, the respondents depended on carbohydrates as the basis of their diets, i.e. bread, rice, potatoes, fava beans, *tamiya*. meat, poultry and fruits were purchased on special occasions; a minority reported eating meat and poultry or fish once a week. Cheeses (old fermented, and the fat-free variety), onions, radishes, and tomatoes were important items of the daily diet. Strong highly-sweetened tea is drunk by old and young several times a day."

**Water Used for Cooking.** Generally speaking, drinking water is also used for cooking. However, some villagers prefer to use canal water for cooking dry beans and lentils. They claim that cooking with piped water takes a longer time and changes the taste of beans due to the hardness of the water. Women justify the use of canal water by saying it cannot be harmful since the water is boiled and is obtained early or late in the evening from upstream where nobody is washing or polluting the canal.

The rationale for using canal water to cook certain legumes may be based on reasonable assumptions, as revealed by the analytical tests performed. The total solids, hardness and chlorides in canal water (279 mg/l, 80 mg/l, and 35 mg/l respectively) are much lower than that of the public source and hand pumped water (653 mg/l, 135 mg/l, and 140 mg/l, as given in Table 7). The presence of these substances in excess constitutes hard water, and hinders the proper cooking of legumes such as beans and lentils.

**Mode of Cooking.** Women ordinarily peel all vegetables with coarse skin, then rinse them in a little water in any cooking pan. On the other hand, vegetables that require plenty of water, such as lettuce and moulukhia leaves, are washed in the canal. Fish is also cleaned in the canal for the same reason.

It was observed that while cooking, women economize with the use of water. Hence, they may use the same water for several tasks. Women may wash several kinds of vegetables with the same water, and they may use the same water to rinse a dirty cup or plate. For kneading dough, however, women are careful to use the cleanest water, which is that used for drinking.

**Cooking Areas.** The place of cooking within the household differs according to the type of house construction.

Respondents living in the adobe houses cook their daily meals in the courtyard where most of the latrines are found. Cooking is generally done on the dirt floor. Women sit on the floor close to stored water, the cooking pans, and the oven. Poultry may be running around them, and the *zareeba* is in close proximity.

Some of the families who live in adobe houses in both villages (29% in Kafr Shanawan and 26% in Babil) attend to their cooking either in a bedroom or in the storage room. Cooking takes place on the floor where stored water and utensils are found.

For those living in red brick houses and having tiled or cemented floors, cooking patterns may differ. Most frequently (41% in Kafr Shanawan and 43% in Babil), the preparation of food is done in at the hallway, and again the majority place all needed materials on the floor except for a few who use tables. Only a few families in both villages have allocated and make use of a special place (kitchen) for cooking.

**Washing of Eating and Cooking Utensils.** Washing utensils is another chore that women pursue on a daily basis. Responsibility is delegated to one or two females to one or two females within each household. The chore in

most cases falls on the youngest daughter-in-law, eldest daughter, or youngest school girls during vacations. This job does not require much skill but demands more time and patience.

Most utensil washing is attended to outside the houses, i.e. in the canals, or by pumps or standpipes, except for families who reside in concrete-roofed houses and who have installed water pipes or have employed women who wash at home. The washing of utensils, whether inside or outside the house, is carried out in the same fashion.

Utensils used throughout the day are piled in a big basin, either in the yard, hall, or close to the area where cooking is performed. Occasionally, glasses or plates may be washed separately at home for immediate use.

The optimal time for washing utensils is between 11 a.m. and 2 p.m., because by that time, all used utensils have accumulated, and housewives are ready to resume their cooking for the evening meal. Time spent in washing ranges from one-and-a-half to two hours or more depending on the quantity of utensils being washed.

Before washing, all used utensils - glassware, cutlery and spoons, and aluminum or copper containers of different sizes - are piled into a large basin, which women and young girls carry on their hands to the canal. The amount of utensils varies according to the number of persons within each household and the day of the week. The largest number of utensils is usually washed on Fridays because most families cook the main meal of the week on Thursday.

When at the canal, women start by scrubbing the less dirty items, then the greasier ones, after which all utensils are rinsed in the same order. Most glassware and cutlery are scrubbed first, with soap and rice hay instead of the *loufa*, while greasy and soiled utensils are scrubbed very intensely with either oven ashes or regular mud obtained from the surrounding area. Other women may scrub utensils twice, using soap and rice hay. Rinsing is done thoroughly and for several times until everything becomes bright and shining. In a very few cases, those washing at the canal may rinse their utensils at the standpipe before use.

It was noticed that the majority of respondents prefer to use oven ashes or regular dirt for scrubbing all the aluminum utensils, because it gives them a glittering look and keeps them shining like now.

**Water Sources Used for Utensil Washing.** By and large, the observation of the team indicated that cooking and eating utensils are washed at the canals in both villages. Findings of the subsample verified this observation during the field work. Of the 46, 33 (20 in Kafr Shanawan and 13 in Babil) washed in the canal. The six who stated that they either use hand pumps or standpipes reside in

Babil, while 3 in Babil and 4 in Kafr Shanawan washed their utensils at home using tap water.

The respondents gave various justifications for using canal water in washing utensils. An employed woman said: *"Of course, we all know that canal water produces the most glittering and brightest utensils. I always notice women carrying their bright washed utensils and I envy them. I wash at home and my utensils never shine that way, but I am forced by circumstances; I don't have the time, and it is not proper for my social image."* Another informant said: *"Piped water tarnishes utensils. We recognize pots washed with piped water because they lose their glitter."*

In addition, there are practical reasons. 1) All respondents, even those who do not use the canal for washing, agreed that canal water surpasses other water sources in cleaning and brightening cooking utensils, especially the aluminum ones. 2) Another fact is that canal water helps form soap suds. 3) Rinsing utensils needs plenty of water; hence the canal is the most suitable water source. 4) washing in the canal consumes less time, since women do not wait for a turn as the case with other water sources. 5) Washing in the canal saves the women the trouble of carrying water back and forth. 6) Washing in the canal means less mess and more space at home.

It is important to note that the results of water analysis confirm the women's claim that the quality of water differs in the two sources. Canal water has less dissolved salts than the piped water; the salts cause the formation of tarnishing compounds when in contact with the aluminum.

**Other Water Sources Used for Utensil Washing.** Women in Babil tend as well to use standpipes and hand pumps for washing utensils. The procedure varies somewhat, especially at the standpipe, since the women must wait for their turn. The woman first scrubs all her utensils with the ashes and mud at a distance from the stand, after which she is ready for the rinsing stage. Each article is rinsed separately under the tap, thus taking more time than in the canal.

A very few women use tap water at home. They wash in a manner similar to canal washing in order to save water. All utensils are washed in one basin, and are then rinsed in another basin. Used water, in the majority of cases, is disposed of outside the house, either in the canal or down the street. This is a precaution villagers take in order to avoid the overflow of septic systems.

It is important to comment that while most of the respondents in the survey claimed to wash at home, in-depth interviewing and observation revealed contrary results. Most women tended to give expected answers instead of actual practices.

**Fuel Used for Cooking and Baking.** The majority of those residing in adobe houses cook in three ways:

1. **Ovens.** The majority of households own the traditional kind of oven found in all of rural Egypt. It is made of the same mixture used for constructing adobe houses and is used mainly for baking bread, since most families in both villages still bake all or part of their bread at home. Of those residing in adobe houses, 89.9% in Babil and 80% in Kafr Shanawan have traditional types of ovens while many of those living in concrete houses, (86.9% in Babil and 63.4% in Kafr Shanawan) have similar ovens.

Dung cakes are the major source of fuel for the traditional ovens. The majority of the ovens are placed close to the open space within the inner area of the courtyard that leads to the roof. A few have poor ventilation.

It is interesting to note that a new pattern is emerging in Kafr Shanawan, where communal ovens have been installed for the use of the whole neighborhood instead of private ovens which were not provided in some of the new apartment buildings.

The majority of respondents stated that they bake at least once a week, and it consumes the entire morning. Several women within the household, or in some cases neighbors, may help in the process. Great care is given to the dough; it is usually covered with a clean cloth to protect it from the flies and dust. Once the bread is baked, it is left to dry on a sofa or a bed; Then it is gathered into baskets or just placed on the top of cupboards and covered with a clean cloth. The amount baked varies with the number within each household. However, enough is usually baked at least one week.

2. The *Kanoon* is another traditional method of cooking used in rural Egypt and is found in most courtyards. It is built simply with two bricks about 20 cms. apart. Cotton straw or any old wood or dry twigs are used to kindle the fire. A *kanoon* is found in 33.3% of the houses in Babil and 20% in Kafr Shanawan, while in the concrete houses it is found less (11.5% in Babil and 3.6% in Kafr Shanawan). The device is used for certain types of cooking that require strong heat, i.e. cooking of meat and vegetables.

3. **Kerosene Stove.** All households own at least one type of kerosene stove, which is used for cooking, heating water, preparing tea, etc.

4. **Butane Stove.** These are found only in concrete-roofed houses (21.7% in Kafr Shanawan and 18.8% in Babil). They are not used much, since butane gas is difficult to obtain in the villages.

The type of fuel used in baking and cooking is associated with a difference in the health of those using it. In both villages, houses using fuel other

than butane or kerosene show higher incidence of some diseases, such as respiratory, gastrointestinal, and eye diseases.

These findings show that fuels such as solid wastes or dung cakes, especially if associated with poor ventilation, overcrowding, and a high fly index, increase the risk of contracting communicable diseases. This fact may be attributed to the irritating effect of some of these factors on the respiratory system and the eye. Gastrointestinal and other febrile illnesses also may be related to the high fly index associated with solid wastes and dung cakes.

**Food Storage.** The manner of procuring food supplies is the same for both villages. Most fresh foods, poultry, cheese, butter, and spices are bought once a week during the village market day. Other foods are bought seasonally or monthly, i.e. flour, rice, wheat, sugar, tea, onions, garlic, etc. Additional food stuff may be bought daily from the few available stores within each village. Because women are aware that leftovers may spoil if left for a long time, they try to cook just enough for their daily consumption.

**Dairy Production.** All those owning cattle are involved in dairy production. This task is also performed by women and is not left to young girls.

Most respondents claimed that this task requires hand washing prior to attending to chores connected with dairy production.

The containers which are used are all made of clay. Containers are first rinsed out with drinking water, after which containers are placed in a fairly hot oven to dissolve the fat before use. The chores connected with dairy products start with milking cows twice a day, milk separation for butter and cheese is carried out every other day; processing of fat-free cheese is attended to every other day; and the processing of butter and cream is also performed every other day.

**Improper Food Sanitation Practices.** Taking into consideration all the above mentioned practices in food preparation and storage, the following are some of the health hazards that villagers might be exposed to as a result of improper food sanitation.

Food quality may be affected during preparation, storage, and handling of leftovers. The storage of raw food items is usually done on the floors where the humidity is high. Subsequently, spoilage of these items by vermin, rats, and micro-organisms, especially fungi, is common. The latter agents are notoriously known for the production of some toxins (El-Gammal, 1985).

Frying is the most commonly used method for cooking animal protein. This practice, however, destroys many of the heat labile vitamins, such as B complex and C. Consequently, signs of deficiency in these vitamins, e.g. anemia, are commonly detected in both villages. However, this does not imply a direct causative relationship between overcooked meat and anemia. The latter is related to many other things, such as: 1) bilharzia, 2) hookworm, 3) high fiber content in the bread (oxylates), 4) drinking black tea (tanins), 5) very low intake of red meat (i.e. hemeiron), and 6) frequent pregnancies.

Vegetables and fruits washed in canal water may be contaminated with the bacterial and/or parasitic constituents of these waters, e.g. gastrointestinal disease organisms.

A number of respondents (68.8% in Babil and 63.2% in Kafr Shanawan) stated that leftover food is kept at room temperature and boiled only before eating. Boiling leftover food before eating kills most micro-organisms present in food. However, this procedure is not sufficient to destroy completely all the toxins produced during the multiplication of some bacteria. Therefore, to achieve the best results, food should be boiled before storage in order to avoid salmonella or food poisoning which causes gastroenteritis (see Figure 8).

Although copper utensils are still used for cooking, the trend at present is to use aluminum utensils. The main reason for using the latter is that they are easily cleaned and less expensive than copper. Eating plates and cutlery use differ according to occasions. For daily use, plates are made of glazed tin or plastic, and simple spoons are used. However, in the presence of visitors, porcelain plates and spoons of better quality may be used.

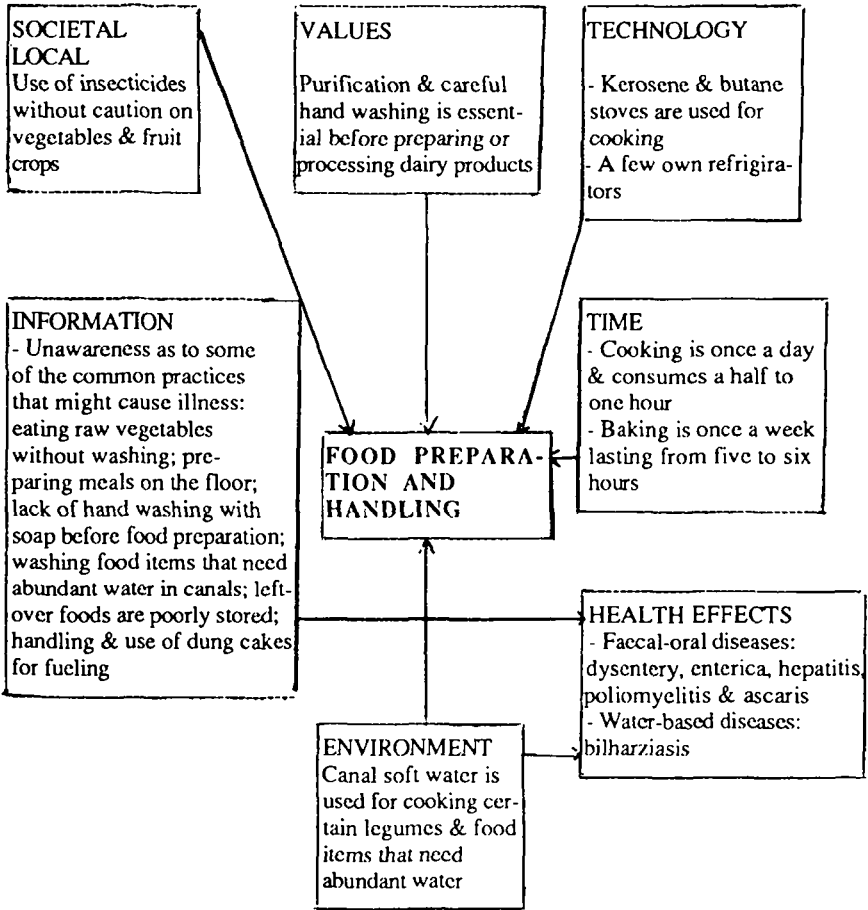
### **Conclusion**

Findings indicate that women in both villages generally do not pay much attention to following proper hygienic measures in relation to food preparation and handling, especially in respect to: washing of hands before food preparation, washing of raw vegetables thoroughly before eating, preparing food on the floor in proximity of poultry, and the mode of storing leftover food. This may be attributed to the fact, that most women are unaware of the health hazards related mainly to gastrointestinal diseases, that might reincounter their families if the minimal basic hygienic standards are not followed.



FIGURE 8

FOOD PREPARATION AND HANDLING



## CHAPTER SEVEN

# HEALTH CARE FOR INFANTS AND CHILDREN

Health care for infants and children is directly related to patterns of behavior in water use and sanitation. It has been tackled from several perspectives by different researchers (Mosley, 1980, 1981, 1983; Tekce, 1982; Feachem, 1984), who agree on the importance of sound health care practices and sanitary environmental conditions for child survival.

The present study is concerned with the role of women, since they are the most important agents in providing health care. Women also may function as intermediate hosts between infection and disease transmission, which may be a consequence of behavioral patterns relating to water use and sanitation. Moreover, high infant mortality rates are reported for both villages, as mentioned previously. This chapter will cover the following areas that are concerned with child health care: birth attendants, feeding practices, standards of personal hygiene, immunization, and care of sick children. The data collected during field observation will describe the common practices in child rearing that might contribute to disease transmission and child mortality.

### Childbirth

To date in most of rural Egypt, traditional midwives (*dayas*) deliver over 90% of all normal births. Normal childbirth is attended to by the *daya* in the home.

Most deliveries take place while the woman is lying on the floor, although in a few cases, the woman may deliver on a bed. Those using the floor usually spread a macintosh, an old sheet, or a blanket under themselves. The main reason for using floors is to avoid soiling their beds. *Daya*-s are supposed to boil the instruments used to cut the umbilical chord, but this does not take place in all cases (Assaad and El-Katsha, 1981).

In most cases where women deliver at home, there are unhygienic conditions such as a dirt floor, unsterilized instruments, and the failure of the *daya* to scrub her hands before delivery. These factors may be the cause for contracting diseases such as neonatal tetanus.

It is worth noting that several respondents, especially in Kafr Shanawan, expressed concern over the low hygienic standards of *daya*-s. In spite of this fact, women continue to seek their help in childbirth.

### **Infant Feeding**

**Breast-feeding.** Newborn babies are fed sugared water for the first three days. The mixture is usually prepared once a day; a piece of cotton is dipped into the water, and then a few drops are squeezed into the mouth of the baby.

Breast-feeding may start on the fourth day because most women believe that milk does not come down until the third day after delivery. Virtually all respondents (98% in the two villages), reported breast-feeding their infants for approximately 12 to 24 months. Their justifications were that: *"There is nothing like mother's milk. It is an easy method. It is an economical method, and it can serve as a means of birth control."*

It was observed that infants are breast-fed whenever they cry, and mothers tend to give them their breast without washing their hands first or cleaning their breast. One respondent, however, said: *"I ordinarily wash my hands before nursing my infant, because while suckling I caress his face and clean the dirt from it."*

**Bottle-feeding.** Few village women resort to bottle feeding. Some, because of certain ailments, are advised by their physicians not to nurse, while others do not breast feed their babies because they do not have enough milk.

Educated mothers are more liable to prepare formulas according to the specific directions, while the majority tend to use less powdered milk in preparing the formula to make the box last longer. Drinking water is used, and in some cases it is boiled, but in most cases it is heated only. It is then poured into a plastic or glass bottle with the powdered formula and then covered with a nipple. The bottle is shaken several times and given to the baby to suck. Nipples are washed mostly with water and only once a day.

Most mothers prepare the formula once a day. A few women claimed to prepare it before each meal, but the research team did not observe this. Mothers generally prepare the formula before attending to their daily chores, after which they delegate the actual feeding to the other women or older siblings within the household.

Prepared formulas are not protected from dust or flies and are left in any part of the house on beds, sofas, or floors. In a few cases older siblings may take one or two sips from the bottle whenever they feel like it.

**Pacifiers.** The use of pacifiers is not a common practice in either village. It was observed that use is higher among mothers who spend more time outside the house. Mothers who breast-feed their babies give them pacifiers between feedings. The majority expressed their reluctance to use pacifiers, for fear that it will be difficult to stop the habit eventually, or to keep the pacifiers clean.

The pacifier is usually attached to the infant's garment with a safety pin or may lie around close to where the baby is sleeping. The pacifier, we observed, is merely rubbed clean by the hand or the garment of the person who is giving it to the baby. Washing pacifiers with water or soap was not observed at all.

**Weaning.** Between the ages of six and eight months, mothers begin to give some solid foods to their infants by the method of "licking." This process is carried out by women who dip their forefinger in the dish, then allow the baby to lick the food off the finger. The food supplement usually consists of boiled potatoes, rice, cookies, a piece of liver, or eggs. By the age of two, the time for weaning, the child will have acquired a taste for the food prepared for adults.

### **Standards of Personal Hygiene**

One of the most important features observed during the study is the role of the mother-in-law or grandmother in the socialization process. The greatest responsibility falls on them, since they are not burdened with house work. Elderly women are usually responsible for feeding infants and changing their clothes when they soil them. Grandmothers help wean older babies. They also keep an eye on children who play in the street, toilet train, and teach grandchildren the basic concepts of cleanliness as they understand them.

The hygiene socialization process varies according to the age of children. Infants and pre-school children were observed to receive less care and attention than their siblings who go to school.

**Bathing.** Infants are not bathed frequently, especially in winter. In some cases, newly born babies are not bathed until it gets warm. The majority of respondents stated that ordinarily infants are bathed 40 days after birth, though they claimed that whenever pants are changed after defecation, clean water is applied to wash away the remaining faeces. We observed, however, that water is rarely used. Instead, women usually rub the baby's bottom with part of the soiled pants before putting on clean ones. One mother said: *"It is better not to bathe infants until they are three or four months old. By then they become strong enough to resist*

*catching cold. Meanwhile, I wash him after he defecates, and I wash his face. It is more than enough."*

Toddlers and older children, the moment they begin to walk and dirty themselves, are bathed once a week. In winter, however, they are bathed less frequently. School children received better care. Their bathing becomes regular, that is, once or twice a week. Sick children ordinarily are not bathed until they get well.

During the summer, school boys (age 6 to 14) may once in a while swim naked in the canal, which may be the source of bilharzia infection. A few girls between six and eight years of age were observed swimming in the canals. However, they were wearing galabeyas and swam at a distance from the boys.

**General Appearance.** Infants' clothing received considerable care. Almost all infants, regardless of sex, are dressed in galabeyas, long underpants, an undershirt, and one or two pullovers in winter, while during summer they wear lighter clothes consisting of a galabeya and an undershirt. Babies' clothes are ordinarily changed at least once a week, while underpants are generally changed whenever the baby defecates.

Pre-school age children receive less care in respect to their clothes. It was noticed that once a child starts to walk, his clothes are neglected. Children are dressed similarly to infants, with the exception that the majority of pre-school age children wear no underpants. It was also noticed that children generally are left bare footed while playing in the streets within their neighborhood. Bare feet make them able to get infected with hookworm when they step on a spot where another child has defecated. One respondent said:

*"Once a child starts to walk and run around, it is hard to keep up with his cleanliness because of the dust. I can change him often, but what is the use; he'll get dirty again. I am also afraid to make him wear shoes because he may lose them playing in the street. After the child is through with playing and is ready to sleep, I change his clothes and wash his face, hands, and feet before bed time."*

Once children reach school age, they start to receive more attention regarding their general appearance. School age children are expected to be better groomed; that is, clothes are kept cleaner and changed more frequently than pre-school aged children, and shoes are worn regularly. They also are instructed to wash their faces and hands before going to school in preparation for the morning inspection in schools.

**Toilet Training.** Toilet training for bowel movement, as reported by respondents, starts one month after birth. Infants are placed several times a day between the mother's legs in a sitting position. Usually this is practiced after the child is breast-fed. The mother waits until the baby defecates on the floor, and then she covers the stool with some dirt or collect it on a paper and throws it out in the street. A few women reported the use of pots. However, this was not observed during the research period. There is no specific training for urination, but most respondents said that by the time a baby walks he starts to control his urination.

Mothers may use a safety pin to pull up the child's galabeya to keep it out of his way while he sits on the ground to defecate. Most pre-school children of both sexes are not trained to use latrines; hence it is not uncommon to observe them defecating in the streets, not necessarily by the canal as traditionally assumed. Instruction regarding the use of latrines starts with school age children.

Several respondents said that they avoid training children of pre-school age to use the latrine because children could easily fall in the latrine hole. Other respondents believed that the evil spirits that live in latrines might harm the children if they fall on the slab surrounding the latrine hole.

**Diarrhea.** Several cases of children's diarrhea were observed, especially during May and July. Mothers were not very concerned since they viewed defecating several times without fever or vomiting as a natural phenomenon often associated with teething of infants. Only in cases of severe diarrhea, accompanied with vomiting and fever, do women seek medical help.

The causes of diarrhea most commonly mentioned by respondents were: 1) drinking large amounts of cold water or other beverages; 2) eating large quantities of sweets and drinking water afterwards; 3) eating rich foods and lots of fat and grease; 4) catching cold, especially at night if not well covered; 5) drinking cow's milk without boiling it or removing the cream from it; and 6) drinking hot and then cold beverages.

It is worth mentioning that none of the respondents in either village attributed the incidence of diarrhea to unsanitary environmental conditions or lack of hygienic measures, although they were asked direct questions about whether polluted water or food, flies, or the spread of solid wastes could be causes of diarrhea.

For treatment of diarrhea, mothers wait at least one or two days before taking the baby to the health unit. However, they first resort to traditional medication, i.e. tea with lemon, starch pudding, caraway, or mint. If the diarrhea persists, they consult the health barber, especially in Kafr Shanawan, where he is trusted by the majority of women, regardless of their educational background.

Only when diarrhea becomes worse and vomiting starts, do women go to the health unit. A few women reported seeking medical help as soon as their children get diarrhea. However, it was our observation that they usually wait a day or two before they do so.

Most women knew of rehydration salts and were familiar with the television ads. Nevertheless, they did not use it as a treatment except when prescribed by a physician.

**Care of Sick Children.** We observed that regardless of the nature of the disease, children are not isolated. In fact, the sick child is kept among the rest of the members of the family, and visitors who drop in to ask about his health sit in the same room. Sick infants, in particular, are carried either by the mother or by any elderly woman within the household while sitting on the floor or bed. Older sick children are allowed to run around, except in cases of high fever, where they are supposed to lie down on beds, mattresses on floors, sofas, or just anywhere.

We noticed that medical care sought for sick children fits into a pattern. During the first day or two, mothers resort to home remedies. In case the sickness persists, they are inclined to use leftover medicine that was prescribed for similar ailments for the same child or for other children within the household. In some cases, mothers were observed to borrow leftover medicine from neighbors. Some mothers may resort to informal health practitioners for advice (*dayas* or a health barber), while others may seek medical advice at the health unit or at a private clinic.

Although there is a consensus among respondents regarding the importance of formal medical care which is within their reach, we observed that in practice formal medical care is only sought after trials of home remedies or informal practitioners' prescriptions. It is quite obvious that formal medical care has not completely replaced the traditional practice.

Women in both villages are unaware of the relationship between water supply, sanitation, and health. They already have beliefs regarding the causes and treatments of diseases, which are in most cases detached from the real cause. Parents, due to the lack of understanding of the causes of disease, often do not know how to prevent disease transmission to their children. The findings of Simpson-Herbert (1984) coincide with the results of this study.

We pointed out earlier that women play a significant role in the process of socialization and in the care of sick children, guided by their own understanding

and perception of what is best for their children. It is important, therefore, to consider women's attitudes and beliefs in promoting change in order to improve the existing health practices and eventually reach better health standards for children.



## CHAPTER EIGHT

### TOWARDS BETTER HEALTH

This study has presented descriptive material regarding behavioral patterns related to the handling and utilizing of water for household purposes, especially by women, and described the environmental conditions under which village people live and work.

Without analyzing household behavior and the factors affecting it, it is hazardous to undertake improvements in community information and facilities in water supply and sanitation with the expectation that behavior will change or that any change will decrease disease transmission. We have tried to outline factors that appeared to influence the behavior in the two Menoufia villages, and we have charted ways in which behavioral patterns and disease transmission may be interrelated. In this conclusion we first present some findings on the incidence of disease in our two villages, and then discuss the prospects for change in behavior related to water and sanitation.

Although the research was not intended to be disease-oriented, nevertheless we could not overlook the fact that human behavior and environmental conditions were found to be associated with some of the pressing health problems within the two villages studied. The major health problems we encountered are of two categories. The first includes diseases related directly to water use and disposal, such as gastrointestinal diseases, infections of skin and eye, parasitic diseases e.g. amoebiasis, ascariis, and bilharzia. The second includes diseases not directly related to water use, e.g. measles, respiratory diseases, and tetanus.

#### Problems and Improvements

It may be helpful to select a number of the specific findings from the present analysis that deserve the attention of concerned people who seek to improve village water supply and sanitation conditions.

1) Women believe that once water is obtained from a pipe, it remains pure and unlikely to transmit diseases. However, they disregard the fact that the mode of water use may contribute to its contamination which, in turn, can be the cause of health hazards.

2) Water analysis indicated that while canal water had a higher bacterial count, faecal coliform, and some parasites, pumped and piped water was harder in content and polluted during the summer months.

3) Because of the hardness of water from taps and pumps, women prefer to wash clothes and utensils in the softer water of the canal.

4) Bringing tap water to a household exacerbates the growing problem of disposal of sullage and septage caused by mounting ground water table.

5) Women generally use the canals to dispose of solid wastes as well as sullage, because there is no system for sullage or solid waste disposal.

6) Respondents assume that since canal water is always running, it cannot therefore be polluted and harmful to health.

7) The majority of respondents believe that bilharziasis is caused only by swimming in the canal and swallowing water while swimming.

8) Most of the adobe houses were observed to have lower hygienic standards than the red brick houses due to poor ventilation, humidity, lack of a septic system, poorly kept latrines, and no drainage system for installed piped water. This in turn affects the health status of dwellers. Adobe houses with poor ventilation and dirt floors are likely to be susceptible to breeding of microbes leading to diseases that are not directly related to water use. On the other hand, water-borne diseases, the focus of this study, rely to a great extent on the hygienic behavioral patterns that are followed equally in adobe and red brick houses, irrespective of the economic, educational or occupational background of the residents.

9) Despite the fact that women recognize the unsatisfactory conditions existing around the standpipes, they feel that maintaining the standpipe is the business of the "government." They do not feel they can or ought to share or participate in improving these conditions.

10) It is obvious that latrines have the lowest priority within the households in regard to up-keep and cleanliness. The majority of women do not clean the latrines on a regular basis.

11) The making and use of dung cakes is widely practiced in both villages. It is observed that no hygienic measures such as washing hands afterwards were taken with respect to the processing or storing of dung cakes.

12) Hand washing prior to food handling, infant feeding, or after defecating was not performed by most women as a regular practice in everyday life.

13) There is no specified area for cooking in most houses regardless of type. Cooking generally takes place on the floor close to animals and the faeces of children.

## Action

These and many other observations made in this study deserve careful review in other villages and whenever improvements are planned.

We feel that behavioral patterns relating to water and sanitation cannot be changed in isolation from other environmental aspects which are interrelated, e.g. sewerage system, solid and sullage waste collection systems, hygienic septic tank evacuation. There is a pressing need, therefore, to address and tackle all existing environmental, health, and behavioral patterns relating to water handling and sanitation in a holistic approach, in order to be able eventually to reach a higher standard of health for villagers, and for children in particular.

The several group meetings held and talks with both respondents and informal leaders suggest that the majority of women in both villages are aware of and have expressed their dissatisfaction with the existing poor environmental sanitary conditions. They even suggested what might be feasible and immediate solutions by which to improve environmental conditions, while a few expressed their willingness to cooperate. However, the main constraint for community participation as expressed by most women was that they felt that responsible bodies would never listen to their complaints or suggestions since it is beyond the women's domain.

In Babil, women indicated two problems: 1) There is no solid disposal system. Respondents stressed the importance of creating a reliable and regular collection system; 2) Standpipes are inadequate and areas surrounding them are muddy which requires up-keep and maintenance.

In Kafr Shanawan, women also stressed two issues: 1) Disposal of sullage and solid waste creates a basic problem, hence, a reliable disposal system is highly desired; 2) The high ground water table causes tremendous problems, hence, there is a need for a simple sewerage system.

Findings of this study also indicate that respondents lack scientific understanding about health hazards that are directly related to the use of polluted water, instead they make distinctions based on their own perceptions and judgements. It is therefore necessary to inform women of the role of polluted water and poor hygienic standards in enhancing disease transmission. In doing so, several points should be considered. Women in both villages are busy most of the day, attending to their house work as indicated in Chapter 3. In their free time, they prefer to visit friends or watch television. Even if the women have some time to spare, they are usually exhausted from the day's work and would prefer to rest than to listen to discussions or attend meetings. Furthermore, rural women are not accustomed to attending meetings. Therefore, it is best to reach them in their

natural setting, i.e. at the different water sources, within their neighborhood close to home, or at the health units where they go for children's immunization.

These suggested modifications and improvements should be backed up with an intensive outreach program, emphasizing personal and domestic hygiene education that relates directly to the findings and conditions of the population under study. The realistic needs of the community should be taken into consideration, as well as the villagers' cultural framework and outlook. This in turn can serve as a model for similar projects in other parts of Egypt, with caution, since consideration should be given to local differences and situations.

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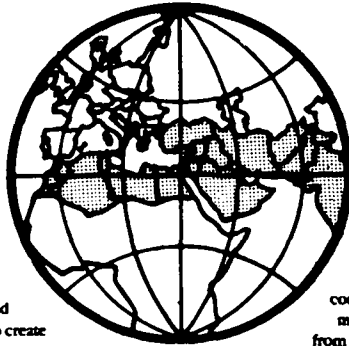
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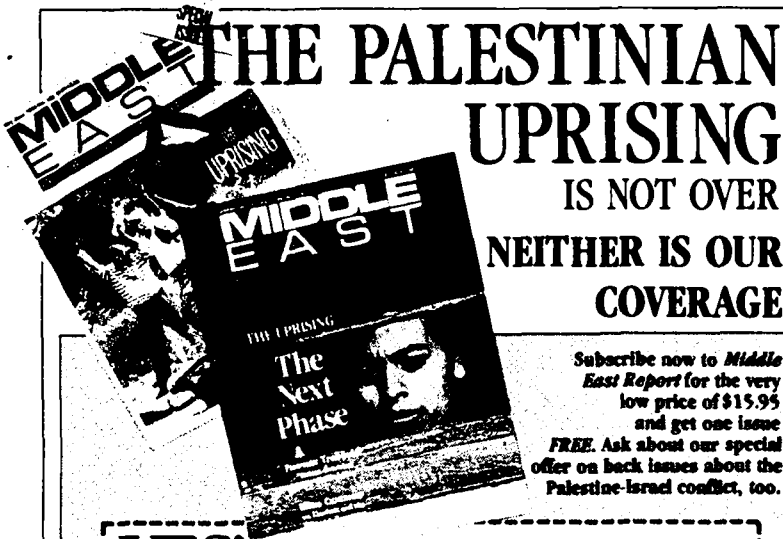
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ولقد تبين أن غالبية النساء في كلتا القرينتين لديهن قصور في الفهم العلمى للعلاقات المتبادلة ما بين استخدام المياه ، نظافة البيئة والصحة العامة ، وان سلوكياتهن تعكس مفاهيمهن عن مسببات وعلاج الأمراض .

وتشير النتائج في كلتا القرينتين ان معظم الأمراض السائدة المرتبطة مباشرة باستخدام المياه هي الاسهال ، الأمراض الجلدية وأمراض العيون . وأن الأمراض السائدة الأخرى الغير مرتبطة مباشرة باستخدام المياه هي الحصبة ، الأمراض المعدية، والتيتانوس . وأن هذه الأمراض الأخرى تنتشر بين الذين يقيمون في المنازل المبنية بالطوب النيء كما أنها ناجمة عن بعض الانماط السلوكية التي يمارسونها .

وقد تبين من الدراسة أيضا أن هناك نتيجة أخرى رئيسية ترتبط بحقيقة هامة وهي أن المرأة الريفية لديها وعى كامل بالظروف المحيطة فلقد عبرت بوضوح عن عدم رضاها عنها . الا أن معظمهن يرون أن العائق الأكبر يرجع الى اعتقادهن بان الاحوال المرتبطة بالمجتمع تقع خارج حدود مسؤولياتهن ، كما أن لديهن احساس بأنه لا يوجد بين المسؤولين من يستمع الى آرائهن وشكاواهن فيما يتعلق باستخدام المياه وصحة البيئة .

ومن الجدير بالذكر أن الانماط السلوكية الغير صحية المرتبطة باستخدام المياه وصحة البيئة لا يمكن تغييرها في معزل عن المعوقات السائدة والمرتبطة مباشرة بالظروف البيئية المحيطة بتلك القرى . ولذلك فاننا نوكد أنه من الممكن جدا الارتفاع بالمستوى الصحى فى حالة تحسين الظروف البيئية المحيطة التى تخدم صحة البيئة لأنه لا يمكن تحسين سلوكيات المرأة المتعلقة بصحة البيئة بدون ذلك .

## ملخص

لقد قام مركز البحوث الاجتماعية بالجامعة الأمريكية بالقاهرة باجراء دراسة ميدانية عن «المرأة واستخدام المياه وصحة البيئة بالتركيز على الأنماط السلوكية المتعلقة بالتعامل مع المياه واستخداماتها فى الأغراض المنزلية» وذلك فى الفترة من أكتوبر ١٩٨٤ حتى ديسمبر ١٩٨٥ فى قريتين مصريتين (بابل وكفر شوان) بمحافظة المنوفية . وتمت هذه الدراسة بواسطة فريق من الباحثين المتخصصين فى الدراسات الاجتماعية و الانثروبولوجية من مركز البحوث الاجتماعية وفريق من الباحثين المتخصصين فى الدراسات البيئية وصحة البيئة من المعهد العالى للمحة العامة بالأسكندرية ليكونوا معا فريقا متكاملًا لاجراء هذه الدراسة الميدانية .

ان اختيار عينة الدراسة قد تم طبقا لنمط المنزل من حيث المساحة المستخدمة فى بنائه - طوبىء أو طوبى أحمر - وعما اذا كان يوجد به مياه نقية ودورة مياه من عدمه .

لقد تم جمع البيانات الاجتماعية الأنثروبولوجية باستخدام طرق وأساليب متعددة منها صحيفة الاستبيان ، الملاحظة بالمشاركة ، المقابلات التى تتم بأسلوب دراسة الحالة وعقد اللقاءات والاجتماعات مع مجموعات مختلفة من الأهالى . ولقد تم جمع البيانات البيئية عن صحة البيئة عن طريق الملاحظات الميدانية بالإضافة الى اجراء التحاليل المعملية للمياه . وبعض التحاليل الطبية عن الطفيليات للسيدات اللاتى فى عينة الدراسة .

ان النتائج الرئيسية للدراسة ترتبط مباشرة بالأنماط السلوكية للمرأة فيما يتعلق بالتعامل مع المياه واستخداماتها فى الأغراض المنزلية مثلما ان هناك صلة وثيقة ما بين تلك الأنماط السلوكية وانتقال الأمراض المتولدة فى المياه .

وتأكيدا لنتائج الدراسات السابقة التى تمت فى هذا المجال ، فانه قد وجد أن اختيار المرأة لمصادر المياه للاستخدام فى الأغراض المنزلية المختلفة يتم طبقا لبعض المواصفات التى يتم عليها اتخاذ قراراتهن فى استخدام أى من هذه المصادر تبعا للوفرة ، الوقت ، الجهد المبذول ، نوعية المياه ومدى ملائمتها لهذا الاستخدام أو ذاك . وقد تبين أن اتخاذهن لهذه القرارات يتم بعناية ودقة بالغة، وفى ضوء التكيف الذى يرجع الى المدركات التى اكتسبها اما خلال عملية التنشئة الاجتماعية أو بواسطة تعديل سلوكهن ليكون متطابقا مع الظروف البيئية السائدة المحيطة والامكانيات المتاحة .



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بحوث القاهرة  
في العلوم الاجتماعية

مجلد ١٢ العدد ٢ صيف ١٩٨٩

مركز البحوث الاجتماعية  
سلسلة بحوث رقم ١

المرأة واستخدام المياه  
وصحة البيئة  
في قرينتين مصريتين

تأليف  
سميحة القطشة  
عواطف يونس  
الفت السباعي  
أحمد حسين

قسم النشر بالجامعة الأمريكية بالقاهرة

لقد اثبتت بحوث القاهرة في العلوم الاجتماعية – التي تصدر أربع مرات في العام منذ سنة ١٩٧٧ – أنها منهل لا غنى عنه لكل من القارئ العادي والمتخصص في شؤون الشرق الأوسط. وتعرض هذه الكتيبات نتائج البحوث التي قدمها العلماء المحليون والزائرون من خارج مصر في مجال متنوع من الموضوعات السياسية والاقتصادية والاجتماعية المتصلة بالشرق الأوسط.

وترحب هيئة تحرير بحوث القاهرة بالمقالات المتعلقة بهذه المجالات للنظر في مدى صلاحيتها للنشر. وتسلم هذه البحوث من ثلاث نسخ مطبوعة على الآلة الكاتبة مع ترك مسافتين بين السطور. ويراعى أن يكون البحث في حدود ١٤٠ صفحة أو أقل و يرفق معه ملخص لموضوع البحث. و يجب أن تتوافق جميع المراجع مع الشكل المتفق عليه في « كتاب الاسلوب لجامعة شيكاغو » (Manual of Style The Chicago) ( وفي هذه الحالة تذكر في الهوامش المصادر فقط وتكتب في صفحات منفصلة ) أو الشكل المتفق عليه في « الجمعية الاثرو بولوجية الامريكية ».

ويتوقف قبول هذه البحوث أو رفضها على رأى الحكام وأعضاء هيئة تحرير بحوث القاهرة. و يبلغ المؤلفون بقرار هيئة التحرير في خلال ثلاثة أشهر من تاريخ استلام البحث.

وترحب هيئة التحرير بتنوع الموضوعات ووجهات النظر. وبالتالي فان الاراء المعروضة في بحوث القاهرة لا تعكس بالضرورة وجهة نظر أو آراء هيئة التحرير أو الجامعة الأمريكية بالقاهرة.

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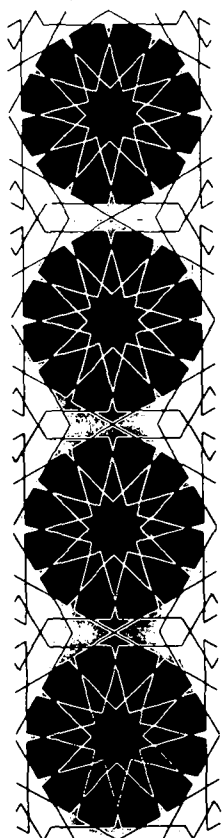
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مركز البحوث الاجتماعية  
سلسلة بحوث رقم ١

## المرأة واستخدام المياه وصحة البيئة في قريتين مصريتين



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سميحة القطشة  
وأخرون

صيف ١٩٨٩

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