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Community Risk Assessment in Tunisia:
Socioeconomic, Hygienic, and Environmental Analysis of
Three Outlying Quarters: R tibat (Kasserine),
Oued Blibane, and Ksibet-Chott (Sousse)
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Three Outlying Quarters: R'tibat (Kasserine)
Oued Blibane and Ksibet-Chott (Sousse)**

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TABLE OF CONTENTS

ACKNOWLEDGMENTS	iii
LIST OF ACRONYMS	v
TEAM MEMBERS	vii
EXECUTIVE SUMMARY	ix
1. INTRODUCTION	1
1.1 Project History	1
1.2 Objectives of the Assessment Study	2
1.3 Approach and Theoretical Framework	2
1.3.1 Internal and External Environment	2
1.3.2 Environment and Human Behavior	2
1.3.3 Environment, Participation, and Social-Welfare Agents	2
2. METHODOLOGY	5
2.1 Description of the Methodology	5
2.2 Themes and Content of Individual Interviews	5
2.3 Themes and Content of the Focus Groups	5
2.4 Themes and Content of the Neighborhood Surveys	5
2.5 Real and Perceived Risks	6
3. SOCIOECONOMIC CHARACTERISTICS OF THE REGIONS STUDIED	7
3.1 R'tibat Quarter in Kasserine	7
3.2 Oued Blibane Neighborhood in Sousse	7
3.3 Ksibet-Chott in Sousse	7
4. PERCEPTIONS OF THE RELATIONSHIP BETWEEN THE ENVIRONMENT AND HEALTH	9
4.1 Comments Made by Officials and the Perception of Environmental Health	9
4.1.1 In R'tibat	9
a. What the Government Officials Said	9
b. What Organizational Personnel Said	10
c. What Politically Employed Technical Personnel Said	10
d. What Technical Personnel in Contact with the Community Said	11
e. What the Politicians Said	11
f. What Elected Officials Advocating Local Democracy Said	11
g. What Grassroots Government Officials Said	12
h. What Community-Level Political Activists Said	13
i. What Organization Personnel from Advancing Organizations Said	13

4.1.2	In Sousse	14
a.	What Community Medical Directors Said	14
b.	What Government/Organization Officials Said	14
c.	What the Political Leaders Said	15
4.2	Community Perception of Sanitation and Environmental Problems	16
4.2.1	In Kasserine	16
a.	Men's Focus Groups	16
b.	Women's Focus Groups	18
4.2.2	In Sousse	20
a.	Men's Focus Groups (Oued Blibane)	20
b.	Women's Focus Groups (Oued Blibane)	21
c.	Men's Focus Groups (Ksibett-Chott)	21
d.	Women's Focus Groups (Ksibett-Chott)	22
5.	FAMILY SURVEYS	25
5.1	Observations of Four Families in the R'tibat District	25
5.2	Observation of Two Families in the Blibane River District	25
5.3	Observations of Two Families in the Ksibett-Chott District	26
6.	DETERIORATION OF THE ENVIRONMENT AND TYPES OF DISEASES	27
7.	CONCLUSIONS	29
7.1	Environment of the Peri-urban District	29
7.1.1	Geographic Character	29
7.1.2	Chaotic Neighborhood Growth	29
7.1.3	Improvised Housing Construction	29
7.1.4	An Economically Marginalized Population	29
7.1.5	The Persistence of Rural Activities in an Urban Setting	30
7.2	Pre-transition and Post-transition Environmental Hygiene Problems	30
7.2.1	Pre-transition Problems	30
7.2.2	Post-transition Problems	31
7.3	Administrative, Technical, and Organization Officials and Community Participation	31
ANNEXES		
	Individual Interview Guide	33
	Focus Group Guide (Community)	35
	Assessment of Sanitary Conditions in the Homes Surveyed	39
FIGURE		
	Environmental Health and Diseases in Peri-urban Neighborhoods	28

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LIST OF ACRONYMS

DGCPL	General Local Public Communities Administration
GESCOME	Projet de Gestion Communautaire de l'Environnement (Community Management of the Environment)
LGSP	Local Government Support Program
NGO	Nongovernmental organization
ONAS	National Office of Sanitation
PDUI	Integrated Urban Development Program
RCD	Democratic Constitutional Union (political party)
SONEDE	National Water Use and Distribution Company
USAID	United States Agency for International Development
<i>Labib</i>	television program about environmental protection
<i>Omda</i>	traditional community organization

TEAM MEMBERS

The team working in the field is composed of four persons representing the following specialties: economics, sociology, training and outreach, and environmental health.

Nadia Bechraoui, economist, is the project director. In addition to logistical support, she coordinates the team members' activities. Mrs. Bechraoui submits periodic reports and helped draft this report. In addition, she maintains ongoing relations with the Tunisian government and USAID officials to keep them apprised of the progress and status of the project.

Ridha Boukraa, sociologist, is an expert in community participation. He brings his experience in the area of methodology design to this assessment study and to the analysis of environmental health risks on a grassroots level. He is the principal team member involved in conducting the diagnosis and in writing the report. As a trainer, he will also take part in training workshops.

Tahar El Amouri, social psychologist, is the trainer/outreach worker for the project. His job is to design and lead all training workshops and to prepare the tools allowing systematic follow-up of participants. He is also producing a video that traces the different steps of the project.

Fatma Guesmi is an environmental health specialist. She identifies individual behaviors in the home as these relate to sanitation and environmental health. She will also act as trainer.

May Yacoob, anthropologist and project designer and director, manages the program from Washington and during missions in Tunisia.

Mona Shediak, a member of the Department of Behavioral Sciences and Health Education at Johns Hopkins University, provided methodological support to the sanitation specialist, Mrs. Guesmi, in the area of methods and processes to be implemented to complete assessment studies. She will also serve as trainer in some training modules.

EXECUTIVE SUMMARY

A risk assessment study was undertaken in two Tunisian cities as part of the USAID project, "Community Involvement in Management of Environmental Pollution," or CIMEP. (The project is called GESCOME in Tunisia, "Projet de Gestion Communautaire de l'Environnement.") The study began with an analysis of the socioeconomic and environmental conditions in three peri-urban neighborhoods in the cities of Sousse (Ksibet-Chott and Oued Blibane) and Kasserine (R'tibat), in order to investigate the relationship between environment and health, the risks to which the population is exposed and how these risks are perceived, and the interaction between various social-welfare actors (i.e., government and technical personnel and organization staff) and the community.

This study is based on four information sources: the results of individual interviews with various government, technical, political, and NGO officials; results of focus group sessions; sanitation-based family surveys; and a film designed to represent graphically the environmental conditions in these communities, as well as individuals' experiences and perceptions of the resulting health problems.

Analysis of the interviews with the various officials reveals a greater diversity of views in Kasserine than in Sousse. In Sousse, elected officials hold greater control over the land; they use their status as local representatives to defend the interests of their communities before government authorities. At the same time, government and technical officials speak in their role as managers upholding the legal system. In Kasserine, what people say is inspired predominantly by their membership in organizations. Most of the officials belong to NGOs.

The social organization of the three neighborhoods reflects traditional community structures, which incorporate mechanisms promoting solidarity, self-help, and participation. In Sousse, the team observed a community engaged in recycling cement sacks for use as charcoal packaging. This innovative, community-level activity attests to the vitality of community mechanisms. In another community, one tribal group breeds camels for use by tourists; they address their circumstances by joining together as a community. Individual behaviors are subject to the influence of the community and its leaders. In Kasserine, neighborhoods reflect traditional ethnic groupings; that is, the *douar* and ties of kinship and solidarity among individuals. Initiatives taken to improve the immediate environment rely on methods of organization that ensure solidarity.

Official authorities relate to the communities by issuing directives to the latter. Inversely, the communities' relationship to authorities is marked by passivity and requests for aid.

In all of the neighborhoods, three related problems are cited: shortage of resources related to uncertain employment; insufficient basic infrastructure resulting from rapid, disorderly neighborhood expansion; and behaviors that reveal the survival of the rural way of life in an urbanized setting. Government managers attempt to deal with these problems by monitoring and controlling neighborhood development in unsanitary areas (for example, close to garbage dumps); by trying to identify substitute economic activities (cottage industries); by drawing up rational development plans; by extending basic infrastructure services (sewers, drinking water, electricity, garbage collection); and by teaching preventive health measures on a wide scale.

The analysis of focus group results and the study of family sanitary conditions reveal a heightened awareness of the risks to which these communities feel they are exposed and which they attribute to a deteriorating environment. The characteristics of this deterioration can be

summarized as follows:

- ▶ Sewer systems do not serve all of the residents. Many residents use nonfunctioning (dry) wells for wastewater disposal, which ought to be periodically emptied and maintained but are not. The remaining water pools in the street and usually stagnates.
- ▶ The three neighborhoods surveyed are located near rivers or riverbeds that are used as waste dumping grounds.
- ▶ Not all families are connected to the drinking water system. Public fountains are poorly maintained. Drinking water is often stored in the home under unsanitary conditions.
- ▶ The nearby rivers and the puddles of stagnant water serve as fly- and mosquito-breeding areas. The rural environment is also home to rodents and spiders, which are disease-carriers.
- ▶ The rural migrants who populate peri-urban neighborhoods often raise sheep, goats, and cattle, sharing cramped living quarters with them and grazing them in public areas, both practices that endanger human health. In addition, because the animals are fed household garbage (in Kasserine) or graze along highways where the grasses are contaminated by automobile emissions (in Sousse), their meat becomes contaminated and may be the source of food poisoning.

The diseases observed in or mentioned by members of these communities include tuberculosis, measles, scabies, ringworm, infant diarrhea, typhoid, and leishmaniasis.

On the list of needs mentioned by the participants, the search for employment is given a higher priority than health and environmental balance. Authorities express a sense of being overwhelmed by the need for resources to address the enormous problems they face. Both officials and community residents could benefit from the development of a participatory approach to addressing environmental health problems. But how, given the limited resources, can the parties involved establish participatory structures that can help control the adverse impact of environmental deterioration on health? The joint identification of microprojects by the community and the officials will provide an opportunity to test the participatory approach and to meet the highly specific needs cited by community residents.

1

INTRODUCTION

The Community Involvement in Management of Environmental Pollution (CIMEP) project is designed to formulate a methodology promoting a participatory approach to the community management of environmental health problems. (The project is called GESCOME in Tunisia, Projet de Gestion Communautaire de l'Environnement.) The project began with a socio-environmental analysis of three peri-urban neighborhoods in two different cities in Tunisia, Sousse and Kasserine. The goal was to investigate the relationship between environment and health and the interaction between the social-welfare actors (administrative, technical, and organization personnel) and the communities themselves. The study also attempted to evaluate the level of perceived risks to the community, while taking into account the degree of environmental damage. This analysis was further intended to assess the existing participatory structures and to establish a participatory approach toward affecting community behaviors. This is what we call risk assessment, which includes analysis of the ecological, socioeconomic, sanitary, epidemiological, and behavioral aspects of the problem.

1.1 Project History

This model project is cosponsored and funded through the U.S. Agency for International Development (USAID) offices of Health and Nutrition, Women in Development, and the Regional Housing and Urban Development Office (RHUDO) in Tunis. Implementation of CIMEP is under the direction of USAID's year-old Environmental Health Project (EHP). Initial planning for the CIMEP activities in Tunisia—which include a series of workshops along with field assessments in Sousse and Kasserine—began in January 1995, and the activity will continue through June 1996.

CIMEP's approach is based on a few main principles. First, for peri-urban areas, the issue is not infrastructure alone, but the *utilization* of that infrastructure. Second, it is not just people's behavior that must change, but also their communities and institutions, because peri-urban issues are not static but ever-changing. Third, intermediaries such as health inspectors, local government officials, high-level decision makers, and leaders of nongovernmental organizations (NGOs) must work in partnership with communities to solve problems. Lastly, with effective collaboration, resources can be marshaled to make positive behaviors more sustainable.

CIMEP's foremost role is to strengthen linkages through facilitating dialogue, improving the skills of stakeholders, and promoting greater understanding and partnership among the various groups involved.

The following CIMEP workshops are scheduled in Tunisia: 1) community management skills; 2) field methods for community environmental behavior; 3) developing an environmental management agenda including indicators and a performance/monitoring system; 4) developing credit and financing opportunities; and 5) project finalization and case study documentation. Each

workshop will include participation by local, municipal, and central government officials, along with NGO leaders.

While the workshops are being conducted, several microprojects, or specific environmental health interventions, will also be implemented by NGOs. In Tunisia, where NGOs are not prominent institutional intermediaries, providing them with management training and institution-building skills is especially important. These activities will provide skills training in identifying high-risk behaviors, developing interventions, and implementing projects—all areas covered by the CIMEP workshops.

The importance of gender roles and the involvement of women are also key aspects of the CIMEP approach. On a community level, CIMEP's focus is on women's groups, because while women are most often the users of water and sanitation facilities, their input is frequently not solicited by government officials and policymakers.

1.2 Objectives of the Assessment Study

The objectives of the risk assessment study are: to analyze the environmental and socioeconomic components of the surrounding milieu; to determine the degree to which the correlation between environment and health can be determined; to study the risks threatening the population, as the latter perceives them; and to study the interactions between the various administrative, technical, and organization agents working in the social arena and the communities.

1.3 Approach and Theoretical Framework

Seen as an analytical tool, the survey is an attempt at the neighborhood level to examine the hypothesis that a relationship exists between environment and health. It seeks to answer the following question: to what extent does environmental deterioration influence the deterioration of sanitary conditions, thus causing disease?

1.3.1 Internal and External Environment

This assessment looked at sanitary conditions both inside the home and in the surrounding outdoor environment. Aspects of the indoor home environment considered include the space enclosed in the dwelling, the size of the house, construction materials used, the position of the house in relation to prevailing winds and the sun, the absence or presence of whitewash or paint on walls, the availability of drinking water, the sanitation system, ventilation, furniture, water and food storage, existence or lack of latrines, etc.

The public environment signifies conditions in the street: stagnant water, garbage dumping, the haphazard siting of houses, unpaved streets and the spread of dust, lack of lighting, presence of animals, industrial pollution, stagnant waste or rain water, public electrification, etc.

1.3.2 Environment and Human Behavior

Specific behaviors by individuals or families can aggravate or mitigate the adverse health effects of a degraded environment. Similarly, despite minimal resources, community behavior promoting solidarity and participation can protect the residents of these peri-urban districts against the harmful effects of disease.

1.3.3 Environment, Participation, and Social-Welfare Agents

The vitality of a neighborhood, which must deal collectively with its environmental problems, depends on community participation. Accordingly, the people's capacity to take action must be nurtured in order to improve the district. The city, NGOs, the neighborhood committees, the RCD cells, and others must all contribute to this mobilization effort.

The full assimilation of a participatory ethic by the community and the social-welfare agents who act as representatives of the local institutions (including elected officials, government personnel, and technical and organization staff) is the sine qua non, and a guarantee, of the success of environmental initiatives. The way in which a community views its future is an indication of the extent to which that community controls its own destiny; furthermore, this ability makes it possible to characterize the needs and priorities set forth by the communities themselves.

2 METHODOLOGY

2.1 Description of the Methodology

The methodology applied consisted of an environmental and sanitary assessment of three peri-urban neighborhoods that were chosen in concert with the local authorities of the cities of Kasserine and Sousse. These municipalities represent two different socioeconomic contexts. Sousse is experiencing urban growth accompanied by expansion of industry and tourism; growth in Kasserine is based on expansion of a tertiary, rudimentary sector representing incipient industrialization. Both cities are the target of significant rural influx. It was for these reasons that the R'tibat neighborhood in Kasserine and the Oued Blibane and Ksibet-Chott districts in Sousse were chosen for this activity.

The risk assessment techniques included holding individual interviews with the various institutional actors, men's and women's focus groups, and neighborhood surveys based predominantly on family visits.

2.2 Themes and Content of Individual Interviews

Interviews sought to elicit the ways in which individuals understood the environmental situation in the three peri-urban neighborhoods; to study and evaluate environmental improvement experiments and practices; to describe the type of participation and the identity of those who took part in environmental improvement initiatives; to identify the diseases caused by environmental pollution; to assess the cooperative relationship among the participants; to assess the human and material resources collected for this purpose; and to study the future projections of these actors.

2.3 Themes and Content of the Focus Groups

The purpose of the focus groups was to describe hygienic behaviors within the home and in public spaces; to investigate the picture the subjects painted of the relationship between health and disease; to study the perception of perceived versus real risks; to study the subjects' attitudes concerning the environmental campaigns launched in the neighborhoods by local authorities; and to clarify the expectations and analyze the subjects' desires and future projections.

2.4 Themes and Content of the Neighborhood Surveys

The investigators observed socioeconomic conditions in the family units and in the neighborhood, sanitary conditions related to personal hygiene, clothing and food, hygiene within the home, number of rooms, ventilation, humidity, natural

and electric lighting, odors, evacuation of wastewater and excreta, disposal of household garbage, presence of insects and rodents, animals sharing quarters with humans, health services coverage, national health programs, and assessment of participation in community life.

2.5 Real and Perceived Risks

This study did not aim to establish a cause and effect relationship between environment and disease, nor to assert that each person exposed to a particular harmful aspect of the environment must necessarily be stricken with a specific disease. Rather, the study was intended to stress the potential risks the environment poses for health; that is, the probability of effect and not a direct correlation. The seriousness of the community's exposure to disease depends on the seriousness of the environmental damage. From these determinations, a scale showing severity of exposure can be established, thereby making it possible to classify communities according to the magnitude of the potential risks posed by the environment in which they live.

The environment incorporates a number of aspects which, when analyzed scientifically, can pinpoint the risks of contamination: food, air and water pollution, sanitation, solid and liquid waste, toxic substances in food, etc. On-the-job conditions may also represent a pathogenic aspect of the environment.

Risk assessment traditionally involves the use of the appropriate biochemical and physical chemistry techniques to analyze the various agents making up the environment which entail risks of disease and to determine the risk percentage to which the community is exposed. This methodology may be termed "objective," since it employs widely used instruments and is based on the objective study of aspects of the environment.

However, the risk assessment methodology employed in the peri-urban neighborhoods of Sousse and Kasserine can be considered subjective and qualitative because it is based on conditions as actually experienced and perceived by the communities involved, on their subjective assessment of the problems resulting from the deterioration of their environment, and on the level of risk to which they feel exposed. It should be noted that the term "subjective" does not mean imprecise or imaginary, since the actual persons affected spoke to us individually and collectively about the conditions in their environment.

The testimony we analyzed comes from the community and from leaders, technical personnel, government officials, and organizational staff members, who showed how the environmental problems were perceived. Comparison of views from these various sources assures the veracity of the data we collected. However, this method does not allow quantification of the risks facing the communities in relation to the sources of environmental harm that were identified. It is not possible to compute a score measuring comparative risk exposure among the communities. On the other hand, the epidemiological approach, although descriptive, can yield overall risk indicators. That approach was implemented only partially, given the short time frame of the study.

3 SOCIOECONOMIC CHARACTERISTICS OF THE REGIONS STUDIED

3.1 R'tibat Quarter in Kasserine

R'tibat is composed of 120 families, or 540 inhabitants. It is situated at the edge of Ez-Zohour City, of which it forms a part, along with other neighborhoods (Bouallegue and Dhouaiba). The proximity of a garbage dump is evidence of urban growth and of the recent establishment of this neighborhood. R'tibat is characterized by its ethnic homogeneity. In fact, an entire kinship group moved from the remote countryside to the city of Kasserine in order to look for work and benefit from city services. This group encountered high unemployment and uncertainty in existing jobs, and as a result, only five heads of family have permanent employment, creating a widespread "public assistance" mentality. Moreover, there are no neighborhood committees, and thus no experience of collective solidarity.

3.2 Oued Blibane Neighborhood in Sousse

Oued Blibane is home to 2,500 families, or 12,000 inhabitants. The location is extraordinary: dwellings are built on the banks and the bed of the river, both upstream and downstream. The socioeconomic status of Oued Blibane's residents is mixed; some are poor, some are middle class.

3.3 Ksibet Chott in Sousse

Ksibet-Chott is made up of 1,500 families, or about 9,200 inhabitants, most of whom are day laborers. One group of residents is heavily engaged in the informal-sector business of recycling cement sacks. This neighborhood, too, is socioeconomically heterogeneous, numbering among its residents both poor and middle class.

All three neighborhoods suffer from the survival of rural economic activities in an urban setting. In consequence, two types of people live side by side, those living in an urban economy and others remaining engaged in rural activities.

4

PERCEPTIONS OF THE RELATIONSHIP BETWEEN THE ENVIRONMENT AND HEALTH

4.1 Comments Made by Officials and the Perception of Environmental Health

4.1.1 In R tibat

a. What the Government Officials Said

- ▶ The definition of the environment stressed its institutional aspect: the environment is defined as the relationship of citizens to existing structures.
- ▶ Participation is the opposite of a request for assistance, or "tawakoul." Participation implies "takatouf" (to support one another) and "tadhamoun" ("solidarity"). The idea of "tawakoul" has religious connotations and is intimately connected with the notion of "ijtihad," or "effort."
- ▶ From a government perspective, a relationship between environment and disease in Kasserine is denied, or at least not perceived.
- ▶ Health campaigns were mentioned and their periodic nature highlighted.
- ▶ Great significance was attributed to the role of institutions in protecting the environment. The city and the Ministry of the Environment can cooperate in creating greenspaces. The Integrated Urban Development Program (PDUI) was also cited as a way to improve and develop the city environment.
- ▶ The most noteworthy municipal measures include sanitation, streets, public electrification, and, above all, the campaign against unplanned urban development, which aims at establishing new tracts of land subject to a consistent development plan, as well as the upgrading of existing tracts to bring them up to standard.
- ▶ The participants stressed the vital importance of standardizing tracts of land, on which development costs would be far less expensive than chaotic land use. Implementation of a development plan yields social benefits and public savings.

b. What Organizational Personnel Said

- ▶ The environment is the totality of factors which determine the way in which residents live. It encompasses the air we breathe and the essential needs of daily life.
- ▶ Within the peri-urban neighborhoods, the issue of the environment is linked to rural migration to the city, which is a consequence of drought. This phenomenon has led to chaotic housing development.
- ▶ The measures the municipality must take pertain mainly to stopping or controlling rural migration. The rural mentality is at odds with the requirements of city life. As an example, the rural migrants do not put their garbage into containers or bins.
- ▶ Poorly constructed houses can produce dampness, which can lead to respiratory illness. Sharing quarters with livestock can cause skin disorders. The lack of latrines or pipelines produces an unhealthy environment, characterized, for example, by bad odors and the risk of bacterial infection. Sheep that feed on garbage give tainted meat. In the summer, puddles breed mosquitoes, which may cause allergic disorders.
- ▶ The municipality cannot meet the needs of all neighborhoods. Health campaigns must be increased in number. The NGOs must work with the city to encourage participatory behaviors, and not those which involve adversarial actions and attitudes.
- ▶ An action plan must be drawn up to fulfill environmental improvement requirements.
- ▶ The building of a collective livestock shed for the urban community and the creation of greenspaces are examples of suitable microprojects.

c. What Politically Employed Technical Personnel Said

- ▶ A healthy environment is one in which people live comfortably; it is the setting in which all living requirements are met. This environment is an infrastructure, but also an ethos.
- ▶ Environmental problems include basic infrastructure problems, rural depopulation, uncontrolled housing development, illiteracy, poverty, disobedience of municipal laws; lack of schools and greenspaces; need for a railroad near the river; lack of water supply and sanitation systems in some city districts; lack of a library or wholesale market.
- ▶ Participation exists in the form of neighborhood committees. However, the investigators observed experiments in participation conducted spontaneously by the residents, specifically, material contributions of cement.
- ▶ A link was ascertained between allergic disorders and the smoke released by the cellulose plant, particularly in the El Khadra City district.
- ▶ A number of health and cleanliness campaigns have been initiated.
- ▶ Human and material resources are available, but they must be used in a

carefully planned manner.

- ▶ Measures to be taken in the future include: strengthening infrastructure, demanding obedience of the law, and limiting uncontrolled housing development.

d. What Technical Personnel in Contact with the Community Said

- ▶ Environmental conditions are not as serious as stated, and the basic problem is unplanned building. Monitoring and restricting this type of building offers a preventive solution.
- ▶ The steps taken by the city include:
1992: drinking water supplied
1992: extension of the electrification network supplying homes
1994: public lighting project
- ▶ The subjects gave the following examples of the implementation of participation: ditch digging, road surfacing, and street cleaning.
- ▶ Health campaigns were organized to prevent diseases caused by stagnant water or by the consumption of tainted meat.
- ▶ The neighborhood associations and junior chambers of commerce provide coordination and serve as intermediaries between citizens and municipal officials.
- ▶ Future needs include preventing unplanned housing construction, promoting participation and awareness among the citizens, and increasing the number of greenspaces.

e. What the Politicians Said

- ▶ When the person interviewed contemplated the definition of "environment," he mentioned the Natural Office of Sanitation (ONAS) and the lack of latrines in the neighborhoods. He cited the problem faced by Kasserine, which is located on a catchment area and is therefore subject to flooding. He also mentioned the problem of a flock of 5,000 sheep in Kasserine.
- ▶ Road surfacing was also cited as a problem, but emphasis was placed on the ONAS pipeline extending along the river, which can be covered by sand accumulations.
- ▶ Participation must be ensured by invigorating the neighborhood committees.
- ▶ There are no diseases that could draw attention and cause apprehension.
- ▶ The movement toward solidarity ("Mad Tadamuni") must be strengthened at the national level.
- ▶ The role of the "destourien" cell was given fundamental importance.
- ▶ Environmental protection must include protecting the city against the

risks of flooding from the rivers that flow through it.

f. What Elected Officials Advocating Local Democracy Said

- ▶ People's relationship to the environment is personal and involves openness and communication and ensuring quality of life.
- ▶ The persons interviewed stressed the need to change behaviors related to the following problems: only 25 percent of trash bags are used; trash receptacles remain unused; and housing development is uncontrolled.
- ▶ Attempts must be made to improve infrastructure and change behaviors and attitudes. Furthermore, efforts to raise awareness and promote strict obedience to the law must be carried out vigorously.
- ▶ Participatory experience includes: the improvement of tax-payment rates, participation through labor, and the need to create an atmosphere of trust and enjoyment by creating public gathering places allowing city residents to learn to accept one another.
- ▶ Infrequent cases of illness are sometimes caused by poisoning from tainted meat, but this has never been an epidemic.
- ▶ The national government, the city, the junior chamber of commerce, and the neighborhood committee must work together to improve the environment.
- ▶ Participation is hindered by the persistence of a public assistance mentality in the poor district of R'tibat. On occasion, the high unemployment rate can be explained by the reluctance of young people to perform available agricultural work.
- ▶ The PDUI, which has financial resources available, already applies the concept of participation.
- ▶ The future of local democracy looks promising.

g. What Grassroots Government Officials Said

- ▶ The environment is essentially defined by the basic infrastructure, which still malfunctions in peri-urban neighborhoods.
- ▶ Existing problems are poverty related: basic needs are not met. Of the 560 neighborhood inhabitants, only 4 have regular employment. The others are part-time day laborers employed intermittently in government-sponsored construction.
- ▶ R'tibat has benefitted from drinking water and electrification projects ordered by the president (rationale underlying subsidies).
- ▶ Participation is viewed as an outcome of neighborhood committee involvement.
- ▶ The *omda* (traditional community organization) stressed the existence of sometimes fatal respiratory illnesses contracted in unsanitary, humid, and cramped dwellings.

- ▶ Health is a severe problem because of the lack of health care facilities. In Ez-Zouhour City, there is one health center for 20,000 inhabitants.
- ▶ The immediate focus should be on extending sanitation pipes.

h. What Community-Level Political Activists Said

- ▶ Environment is linked to cleanliness, but the city is not active enough in the neighborhood.
- ▶ The problems are drinking water and electrification.
- ▶ The sanitation system is inadequate. Many childhood illnesses are caused by the hygienic deterioration of the environment.
- ▶ Citizens have not participated in this field. Attitudes are informed mainly by the request for assistance (*sadaqa*, a religious notion).
- ▶ The invasion of flies and mosquitoes results from the presence of surrounding *oueds*, or temporary streams, which cause allergic disorders.
- ▶ Health campaigns do not produce major accomplishments.
- ▶ There are no neighborhood committees. Youth unemployment remains the most important problem.
- ▶ Need for greenspaces and jobs.

i. What Organization Personnel from Advancing Organizations Said

- ▶ The environment encompasses all of the components affecting human existence.
- ▶ The problems: demographic concentration, housing in disarray, insufficient *tandhim* organization, absence of paved roads.
- ▶ The most highly organized areas are those in proximity to the city. The farther away from the city and the deeper one goes into the neighborhoods, the less organization one encounters. This is true of the R'tibat district, which is located on the periphery of Ez-Zouhour City and is not yet connected to the sewer system.
- ▶ Sanitary education and family planning do not exist. There is a shortage of sanitary facilities and recreational spaces (*muntazah*).
- ▶ Epidemics are nonexistent, but cases of diarrhea due to contamination do occur.
- ▶ Citizens have had to leave the rural areas, where there is no available water or electricity. Citizens are entitled to the benefits of civilization, such as radio, television, and health care.

- ▶ There are no neighborhood committees, and the municipality plays an intermittent role. No ongoing measures are undertaken.
- ▶ It is very difficult to ask for material contributions from the destitute.
- ▶ Health campaigns focus on vaccinations. Health education associations play an important role.
- ▶ The solution for the future lies in job creation through investment in industry and tourism in the mountainous areas.

4.1.2 In Sousse

a. What Community Medical Directors Said

- ▶ The environment is everything related to the life of the individual as seen in its biological makeup. Air, water, and land pollution may be at the root of an imbalance between man and the environment.
- ▶ The peri-urban neighborhoods of Sousse experience conditions midway between rural and urban life.¹ They house semi-rural people living in a communal urban area.

Ksibet-Chott District

- ▶ The close proximity of the industrial area explains the existent air pollution and presumably explains the skin diseases, diarrhea in the hot season, and respiratory disorders.
- ▶ For participation to be successful, programs must meet the beneficiaries' needs. Citizens must see their own interests reflected in these activities. For example, in the community physician integrated anti-mosquito campaign, the population was involved in the work of draining standing water and cleaning house fronts.
- ▶ In Ksibet-Chott, the beach used by the neighborhood residents had to be cleaned.
- ▶ Health agencies cooperate with other administrations, such as agriculture,

¹On this subject, WHO makes a distinction between *pre-transition* environmental health problems (water supply, sanitary conditions and wastewater, solid waste, food hygiene, vector-borne diseases), and *post-transition* environmental problems (pollution of outdoor and indoor air pollution, occupational diseases, toxic substances in materials used by humans, and pollution and traffic injuries).

tourism, and the National Water Use and Distribution Company (SONEDE).

- ▶ Health sanitation courses were organized in conjunction with neighborhood committees.
- ▶ Potential future actions include developing a coherent building plan, increasing the number of greenspaces, improving the collection of household waste, planting trees, and laying cement down on the roads.
- ▶ Community environmental management must focus on feasibility and on the impact on the living standards of the beneficiaries.

Oued Blibane District

- ▶ The citizens have built on the banks (and sometimes on the bed) of the river, which are subject to flooding.
- ▶ The river is a dumping place. Solid and liquid waste is dumped there.
- ▶ This is a potentially dangerous area, in which there are risks of disease propagation caused by mosquitoes.

b. What Government/ Organization Officials Said

- ▶ The environment is human, physical, and socioeconomic in nature. The physical environment encompasses the natural site; nevertheless, the socio-cultural environment, which is made up of lifestyle and the pattern of social organization, must not be neglected.

Ksibet-Chott

The problems can be summarized as follows:

- proximity of the public trash dump
- proximity of the industrial area
- proximity of the Hallouf River
- poverty level, mostly among day laborers

Noted was a community that recycles paper from bags of cement in order to sell it as wrapping paper.

Oued Blibane

The problems can be summarized as follows:

- people live with animals
- lack of basic infrastructure
- proximity of a river (*oued*)
- real estate problems: land subject to flooding is sold for development in a disorderly and clandestine manner
- lack of connection to the ONAS network
- drinking water supply exists, but there are risks of contamination

from wastewater

- dead-end streets not lit
- reported diseases (scabies and tuberculosis)
- animal waste dumped in the streets
- cowshed in the neighborhood

- ▶ The solution lies in finding income-producing activities that are alternatives to animal husbandry in urban areas.
- ▶ The environment in Oued Blibane poses a health and a safety problem: the threat of disease arising from animals living with humans and the threat of flooding of the dwellings built on the banks of the *oued*. The radical solution is to move the 120 families living in Oued Blibane who are threatened with flooding to normal living quarters.

c. What the Political Leaders Said

- ▶ In Ksibet-Chott and Oued Blibane, political leaders representing community interests are emerging.
- ▶ In Oued Blibane, the leader is a lawyer chosen by the displaced persons living in the district. He defends his community before central public authorities. His major concern lies in removing the dual safety and sanitation threat posed by the Blibane River. Improvements to the river will require an investment of such magnitude that only the government can make it. He is thus petitioning the government, which can implement the requisite radical environmental solution. In his view, the participatory project represents a method aimed at "taming" the citizenry, rather than solving daily problems and the threat of disease and flooding to which residents are exposed. During the course of the discussions, however, he moderated his position and ultimately suggested the opportunity for a microproject and community participation exists.
- ▶ In Ksibet-Chott, the community leader, a civil servant, is enthusiastic about solving the environmental problems posed by keeping animals in the neighborhood, industrial pollution, the proximity of the waste dump, and the problems arising from the use of the Hallouf River as a dumping ground by the surrounding factories.
- ▶ In both neighborhoods, participation was advocated as part of an activist political plan.
- ▶ Accordingly, both neighborhoods face the problem of livestock breeding. The Ksibet-Chott district has about 30,000 sheep and is considering the creation of a communal enclosure (*mahmia*). In Oued Blibane, a group of residents from central Tunisia is renting camels, donkeys, and horses to tourists for excursions which infringe on the safety of the residents of the peri-urban neighborhoods.
- ▶ In addition, the neighborhoods are exposed to disturbances caused by traffic. Grazing areas used by sheep are contaminated by CO, CO₂, and lead. The meat derived from these flocks poses an unquestionable potential threat, but it is perceived only by veterinarians.

4.2 Community Perception of Sanitation and Environmental Problems

4.2.1 In Kasserine

a. Men's Focus Groups

Domestic and Public Environmental Conditions

Domestic Space

The main themes stressed are cramped family space, drinking and wastewater, and the presence of animals in living quarters.

- ▶ If the house is not cleaned frequently, it is because the house includes only one room, and it is difficult to clean just one room using public fountains.
- ▶ The interior is not furnished, and there is usually no bed.
- ▶ Running water is lacking in a number of households; those residents buy water and store it under unsanitary conditions.
- ▶ Latrines are lacking in some households.
- ▶ Showers are lacking in the houses. People wash themselves periodically at Turkish baths.
- ▶ Lack of sewers, which makes it necessary to empty the latrines periodically, although this task is sometimes not done often enough.
- ▶ Having running water in the house creates an additional problem if no sanitation system is available, because the water stagnates in front of the dwelling.
- ▶ In the absence of a sanitation system, the housewife pours out wastewater in front of her door, thereby aggravating pollution in the streets.
- ▶ People live with animals in the same room.

Public Space

- ▶ People are concerned by the problem of collecting household garbage. The accumulation of garbage causes the proliferation of flies and mosquitoes and makes children's play areas unhealthy. Insecticide containers are sometimes left in trash piles and pose a danger to children.
- ▶ Proximity of the city dump. Public garbage is dumped into the river.
- ▶ Proximity of the factory, which, depending on wind direction, could spread waves of suffocating fumes.
- ▶ Proximity of the slaughterhouse, which gives off noxious odors.
- ▶ The animals (goats and sheep) wander in the streets and feed on garbage. Their meat is thought to cause illness.

Environment and Disease

The relationship between environment and disease is more obvious to men than to women.

- ▶ Water-borne diseases are caused by the use of poorly stored water.
- ▶ Respiratory diseases are caused by fumes from the cellulose factory (asthma).
- ▶ Diseases affecting children are caused by the presence of trash and stagnant water in the streets.
- ▶ Diseases are caused by the consumption of meat from undernourished animals.

These various diseases most often strike children and the elderly.

Role of Institutions

- ▶ Important reservations were expressed with regard to the hospital, which, in the view of the people interviewed, does not appear to perform its functions properly.
- ▶ The city was criticized. The district does not receive standard city services: garbage collection, street cleaning, outdoor lighting.
- ▶ Cleanliness campaigns are intermittent and do not meet residents' needs.

Prospects for Participation

The men expressed a certain skepticism regarding the potential for participation of the residents, who are thought to be a little too individualistic. But here the issue of unemployment, which was frequently mentioned in the interviews, resurfaced. People are destitute and cannot participate through work. They count substantially on the active role of public institutions, a role which, in their view, must be carried out to ensure

popular participation.

The men also deplored the lack of a district committee which could encourage and mobilize them.

The Role of the Media

Men were found to be better informed than women about the environmental protection programs broadcast by the media. However, they watch and listen in order to compare their own situation, marked by shortages and deprivation, to the conditions existing in other, more highly developed towns. They stressed the inadequacy of the publicity spots (Labib) with respect to the lack of even the most rudimentary facilities and infrastructure (sewers, garbage cans).

Desired Improvements

- Sewers
- Regular collection of household trash
- Stop animals from roaming the streets
- Paved roads
- Nursery schools
- Public transportation
- Clean schools
- Numbering of houses to facilitate mail delivery
- Distribution of trash bags
- Electrification
- Limits placed on unplanned building

These improvements suggest the desire to move toward an urban status comparable to the other, richer neighborhoods in the city.

b. Women's Focus Groups

Domestic and Public Environmental Conditions

From their perspective as homemakers, women cited the same concerns as did the men: increased living space, water and sewer problems, scarcity of resources.

Domestic Space

- ▶ Scarce, cramped space: in many households, the dwelling is limited to one room, in which the entire family is forced to live together.
- ▶ Lack of ventilation: rooms are not lit or ventilated.
- ▶ Lack of lime-based whitewash on walls and, therefore, exposure to microbial infection.
- ▶ Lack of paving stones. Floors are muddy and difficult to clean.

Accordingly, filth from various sources accumulates.

- ▶ Lack of water pipelines causes water shortages which subject children to various diseases.
- ▶ Absence of latrines.
- ▶ Lack of sewers, thereby making draining of wastewater impossible and leading to nauseating, unhealthy puddles of stagnant water.
- ▶ Scarcity of resources and the inability to purchase detergents and household supplies needed to clean household interiors (detergents, brooms, etc.)
- ▶ The scarcity of water makes daily personal washing difficult and frequent recourse to public baths can be costly.
- ▶ Use of wood from nearby trees for cooking and heating (which created indoor air pollution).

Public Space

Women are worried by the deterioration of the public environment because it affects their living space.

- ▶ Unpaved streets are either muddy or dusty.
- ▶ Stagnant pools of wastewater, household trash dumped in the streets.
- ▶ Proximity of a trash dump in the city of Kasserine. When the garbage is burned by the city, fumes blow into the neighborhood.
- ▶ Absence of public lighting in some streets.

Environment and Disease

The women interviewed are aware of the health danger that a deteriorating environment poses. In this respect, they make a distinction among the following diseases:

- Diseases caused by the defective properties of domestic and public environments: respiratory diseases, bacterial diseases affecting mainly children, skin diseases.
- Diseases propagated by flies and mosquitoes (dehydration, diarrhea).
- Diseases spread by rodents.
- Diseases caused by roaming animals and by goat- and sheep-breeding in the neighborhood.

The Role of Institutions

- ▶ The neighborhood residents appear to expect much from the city: pipelines,

paved streets, garbage cans and containers, and nurseries are the principal demands prioritized and put forward by the women.

- ▶ The city does not seem to play a major role in the neighborhood: there are no trash containers or garbage cans.
- ▶ On the other hand, the women mentioned the role of the party cell, but not for the purpose of solving the vital problems of the neighborhood. These problems are the city's business. NGOs are unknown.

Prospects for Participation and the Role of the Media

The women of the R'tibat district feel they are marginalized by the city, and the advertising spots on television do not appear to be directed toward them. However, they expressed their desire to take part, through their own labor, in city programs designed to improve residents' living conditions.

Desired Improvements

Among the women, there is a sharp awareness of the domestic and public environmental deterioration and of the relationship existing between this deterioration and diseases affecting children, in particular. This awareness is accompanied by a strong desire to find solutions.

- ▶ Nevertheless, they feel their destitute status strongly, and they have major demands to make of the city: pipelines, improved housing, removal of the garbage dump to a more remote location, and connection to the sewer system are priorities.
- ▶ Women express nostalgia for their rural way of life when they describe the problems of their daily existence in the peri-urban neighborhoods of Kasserine.

4.2.2 In Sousse

a. Men's Focus Groups (Oued Blibane)

Domestic and Public Environmental Conditions

Men believe that normal cleanliness is not maintained in their households. Wastewater is dumped into the streets, contributing to environmental pollution. However, men bear the responsibility for the external environment. On occasion, the sewers spill over and are not monitored.

- ▶ Men deplore the expansion of farming in an urban area populated by people uprooted from other regions.
- ▶ The river has been transformed into a garbage dump site and promotes the proliferation of flies and mosquitoes.
- ▶ There is an atmosphere of tension within the neighborhood between

livestock breeders and other residents.

Environment and Disease

Men are concerned in particular by the dangers that mosquitoes pose for children (from stagnant water, accumulation of trash).

Prospects for Participation

- ▶ A success story: the RCD cell and the community took part in laying a cement covering on the streets.
- ▶ And a failure: the installation of the sewer line did not rouse the citizens to action. Rather, they waited for the authorities to act.

Desired Improvements

The residents want the following improvements: electricity, greenspaces, periodic collection of garbage, the desire to see the river transformed into a recreational lake, extension of the sewer system, and recreational activities for children.

b. Women's Focus Groups (Oued Blibane)

Domestic and Public Environmental Conditions

- ▶ Women mentioned the same concerns as men: flies and mosquitoes; animals in living areas; lack of sewer lines; stagnant, smelly water; lack of frequent garbage collection. However, all of these observations were expressed by city dwellers unable to find common ground with semi-rural people.

Environment and Disease

- ▶ The women spoke about skin and respiratory diseases related to the environment and to the presence of animals, including not only dogs, sheep, and goats, but also frogs, which frighten urban women. They are unaware that, by feeding on mosquitoes, frogs play a major role in the protection of the environment.
- ▶ The women stressed that their children were exposed to mosquito bites.
- ▶ They were concerned by the problem of wastewater poured in the streets and the resulting stagnation, even though the streets are often paved and by their inability to ventilate their houses because of the threat of mosquito infestation.
- ▶ They were afraid of accidents resulting from the use of powerful insecticides.

Prospects for Participation

- ▶ The women mentioned community participation in street-paving operations (spreading of gravel, food offered to workers, etc.).

The Role of the Media

- ▶ The women cited the inappropriateness of advertising messages in relation to the needs of poor areas. The messages show well-dressed, affluent people with whom the poor cannot identify.

Desired Improvements

- ▶ The women stressed the city's unfulfilled promise to install sewers and to collect garbage regularly.
- ▶ The women asked for the development and improvement of the river, a true source of pollution and disease, for extension of the sewer system, and for increased greenspaces.

c. Men's Focus Groups (Ksibet-Chott)

Domestic and Public Environmental Conditions

Domestic Space

- ▶ Because of frequent water shutoffs caused by the proximity of factories, residents have learned to store water in bottles or plastic containers, but under questionable hygienic conditions.
- ▶ The water used to wash dishes is used again to wash the floor, another health risk.
- ▶ While residents in some households have showers, others go to public baths.
- ▶ Latrines are lacking in some households.
- ▶ Ventilation is a problem, because houses built in an unplanned manner sometimes have no windows.

Public Space

- ▶ Household garbage is not collected regularly.
- ▶ Lack of containers and garbage cans.
- ▶ Unpaved streets cause dust.
- ▶ Proximity of waste dumps from adjoining factories and the hospital.
- ▶ One group of people specializes in producing bags made from cement sacks. The use of this paper poses a health risk, if it is used to package food products.

Environment and Disease

- ▶ Factory and hospital waste may cause disease.
- ▶ Dust probably causes chronic bronchitis.
- ▶ Scabies exists in the district.

Role of Institutions

- ▶ People were highly critical of the city, which appears to lack the resources needed to meet the needs of all of the neighborhoods, even though the neighborhood is close to the tourist facilities in the city.

- ▶ The neighborhood committee is very active, as evidenced by the fact that several residents took the initiative of renting garbage collection machines. A spirit of voluntarism to deal with neighborhood problems is growing. Residents are prepared to take part by implementing activities of community interest.

The Role of the Media

- ▶ The responses of the people interviewed revealed their receptivity to media messages concerning the environment. "Labib" is well-known and radio programs are popular.

Desired Improvements

- ▶ The priorities were as follows: tree planting, asphalt-paved roads, greenspaces, and nurseries.

d. Women's Focus Groups (Ksibet-Chott)

Domestic and Public Environmental Conditions

- ▶ The women placed a greater emphasis on the public environment, which, in fact, determines conditions in the household environment. Outside conditions have deteriorated to the point that some households never open their windows.
- ▶ The neighboring factories emit fumes that dirty the laundry.
- ▶ Waste from various sources is thrown into the river, causing nauseating odors.
- ▶ The makers of bags from cement sacks throw the remnants of these sacks into the street, and the streets are never clean.
- ▶ When incinerated, city garbage produces odors and suffocating fumes.
- ▶ Garbage accumulated in the street becomes a place for children to dig and play in.
- ▶ Trees cannot be planted because of the presence of animals, and wandering goats sometimes enter houses.
- ▶ The beach is polluted and a source of disease for children.
- ▶ These environmental conditions cause the proliferation of flies and mosquitoes, which force the residents to close up their houses to prevent infestations. The potential damage from the surrounding environment can be explained by the following factors:
 - presence of polluting facilities: refuse dump, factories, and the hospital

- the polluted river environment
- human behavior characterized by a rural lifestyle unsuited to urban conditions

Environment and Disease

- ▶ Respiratory diseases
- ▶ Scabies and ringworm

Role of Institutions

- ▶ High expectations that the city will fulfill its cleaning and garbage collection functions.
- ▶ Educational institutions (schools, social workers, health clinics) must play a role in protecting the environment.

Prospects for Participation

Women are more reserved and skeptical about voluntary service and participation by residents than are men. Attitudes are still dominated by individualism and a rural mentality. It is difficult to urbanize the district when some of the residents are uprooted farmers.

Nevertheless, citizen participation in road-paving was fruitful and instructive. The residents took part by spreading gravel and feeding the workers.

The Role of the Media

The women are convinced that the media promote health education. People watch the "Labib" advertisements and consider them useful.

Desired Improvements

The women want to see their district resemble the more modernized neighborhood of Bouhssina. However, they stressed the need to urbanize the district by prohibiting livestock-raising. Priorities include moving the garbage dump farther away, a clean health clinic, and the creation of greenspaces.

It should be pointed out, however, that the focus groups conducted in Sousse were not able to bring together the rural natives living in the community. The latter are viewed as illicit dwellers who, within the city limits, are pursuing their breeding activities.

5

FAMILY SURVEYS

5.1 Observations of Four Families in the R tibat District

The heads of household of the families surveyed and their spouses were illiterate, elderly (late 40s to 60), and without permanent employment. The average family had seven members, and there were approximately five children per family. About two children per family discontinued schooling. Each family had one handicapped member. All families owned their dwellings. Of the four houses, only one had no electricity or running water. One family out of four had a television set, and one, a radio.

The following observations were made relating to hygienic practices:

- ▶ Food exposed to dust, rodents, and insects because of lack of preservation methods.
- ▶ Unsanitary homes, which were poorly ventilated and received little sunlight (high humidity level, nauseating odors).
- ▶ Cramped living space: one room measuring 7 square meters for 6 people, one room measuring 6 square meters for 7 family members, 3 rooms for 6 people, and 3 rooms for 10 people.
- ▶ Drinking water unsafely stored, unsanitary water supply conditions.
- ▶ Latrines badly designed and maintained.
- ▶ Unsanitary household garbage disposal. Presence of pathogenic vectors (insects and rodents).
- ▶ People do not live with animals because they cannot afford to buy them, not for health reasons.
- ▶ No health education; vaccination schedule poorly implemented; irregularity of prenatal and postnatal visits. However, the rate of the childhood vaccination coverage is satisfactory. No transmissible diseases reported, although families are potentially exposed to a high degree of risk.

5.2 Observation of Two Families in the Blibane River District

One head of household was 33 years old, illiterate and unemployed. The other was 58 years old, also illiterate, and a farmer. Their wives stay at home; one was illiterate, and the other had a secondary education. Each family had six members. We noted a high a number of school dropouts and two handicapped people in a single family. The two families owned their homes. The two homes

had electricity and running water. The dwellings were well ventilated and had sufficient lighting, but were humid.

- ▶ Dwelling space: the first family had three rooms for six people; the second family had two rooms for six people.
- ▶ Drainage of wastewater and excreta is unsanitary. One family had a dilapidated bathroom, without a door and with a zinc roof. Drainage occurs directly into the river. It is difficult to obtain city drainage services. The other family had a poorly designed negative well.
- ▶ Household waste is scattered or thrown into the river. The garbage is mixed with animal excrement in the communal space.
- ▶ Three cases of scabies and one case of leishmaniasis were observed.

5.3 Observations of Two Families in the Ksibet-Chott District

The heads of household were between 40 and 50 years old, their wives between 30 and 40. One husband had a secondary education and

worked on a freelance basis, the other had an elementary education and was unemployed. One of the wives had an elementary education and was unemployed, and the other had a university degree and was a midwife. These large families had about nine members each. One child per family was a school dropout. One family included two handicapped persons. The two families owned their homes, and both dwellings had electricity and running water. Both families had a radio, and one, a television set.

Dwelling space: one family had 3 rooms for 10 people, the other had 4 rooms for 9 people.

One dwelling was connected to the sewer system, the other discharged wastewater to the outside.

Household garbage was scattered in the street, forming nesting sites for flies and rodents.

Good medical care and absence of transmissible diseases were observed.

DETERIORATION OF THE ENVIRONMENT AND TYPES OF DISEASES

Environmental deterioration was evidenced by the following factors:

- Wastewater: Sewer systems are not existent everywhere. Many residents used negative (nonfunctioning) wells which ought to be regularly drained and maintained but were not. Stagnant water was present.
- Industrial pollutants: people in the three districts distinguished among nine types of wastes dumped into the rivers and carried to the sea (as in Sousse).
- Household trash: proximity of intermediary dumps (Sousse) and the final dump (Kasserine).
- Drinking water: no expansion of the SONEDE system, unmaintained public fountains, water preservation and use problems.
- Influx of persons uprooted from the countryside and resulting unplanned building.
- Animals and humans sharing quarters.
- Insects: large number of fly and mosquito breeding grounds; presence of rodents and arachnids; lack of effective extermination methods.

These deteriorating environmental conditions give rise to the following reported diseases:

- tuberculosis
- measles
- scabies
- ringworm
- infantile diarrhea
- typhoid
- leishmaniasis
- various handicaps

CONCLUSIONS

.1 Environment of the Peri-urban District

.1.1 Geographic Character

Geographically, the peri-urban neighborhoods lie on the urban periphery, in areas most remote from the urban center and intended for agriculture, or in areas that were abandoned because of their unsuitability for human habitation. Accordingly, the Oued Blibane neighborhood is located upstream and downstream from a river. Low land prices encourage the new settlers to purchase parcels of land on the banks of the river, and sometimes even on the river bed. Therefore, the residents are exposed to the dangers of flooding during each rainy season. Moreover, because wells exist within the river's boundaries, it becomes a swamp suitable for the proliferation of disease-carrying insects. The Ksibet-Chott district is located near the Hallouf River, into which the surrounding industry dumps its waste. In Kasserine, the R'tibat neighborhood recently merged into Ez-Zouhour City; it forms a "no man's land" suitable for the discharge of public waste. The population of this district is growing while its solid waste pollution is increasing.

.1.2 Chaotic Neighborhood Growth

The lack of preliminary development of housing lots means that the neighborhoods are expanding chaotically, with no regard for the basic rules of sanitary urban growth: e.g., poor layout of roads and unplanned layout of houses, which makes drinking water supply and basic infrastructure costly.

.1.3 Improved Housing Construction

Because houses were built in clandestine fashion, the rules of conventional sanitation are not enforced as regards windows, layout, floors, latrines, etc. Construction materials used and building techniques have resulted in an unsanitary site, conducive to the spread of respiratory diseases. Building was done without regard for the requirements of either a cold or a hot climate. The lack of furniture and supplies needed in the city exacerbates the deterioration of the family's immediate surroundings.

.1.4 An Economically Marginalized Population

Those forced to migrate because of economic precariousness in their rural environment find city jobs that are just as uncertain. It is obvious that in a city like Sousse, industry and tourism offer greater job opportunities than

does Kasserine, which is growing at a rate disproportionate to its economic development potential. The deteriorated environment goes hand-in-hand with shortages of resources and economic instability. Because of the lack of resources, residents are unable to pay city taxes. In turn, low tax revenues leave the cities even more powerless to deal with basic infrastructure problems.

.1.5 The Persistence of Rural Activities in an Urban Setting

The Animal Pollutes the City, and the City Pollutes the Animal

Incapable of becoming a part of the urban economy, those uprooted from their rural environment continue their rural lifestyle. In an urban setting, they persist in raising animals for which no natural, expandable space exists. In the peri-urban districts of Sousse, animal excrement is thrown into the street. The livestock graze on contaminated land bordering the highway. In Kasserine, they feed on household garbage and in Sousse, on grasses along the highway contaminated by the toxic substances emitted by cars. At the same time, disorganized animal husbandry damages the environment. Animal excrement pollutes public spaces and the presence of animals in people's houses threatens human health. In Ksibet-Chott, some people raise animals for tourists (camels, horses, etc.). In addition to the fact that they circulate freely within the neighborhood, the animals wander through children's playgrounds and cause traffic accidents.

.2 Pre-transition and Post-transition Environmental Hygiene Problems

.2.1 Pre-transition Problems

Water Supply and Sanitation

Water shortages in peri-urban neighborhoods pose health risks from contamination and exposure to skin diseases. The expansion of the peri-urban neighborhoods is outpacing the installation of basic infrastructure (sewers and drinking water pipelines). Cities often find themselves powerless to meet the needs generated by rapid, disorderly, and explosive urban growth. However, the installation of a drinking water system without a related sanitation system presents the problem of wastewater removal. Currently, wastewater is most often dumped into the streets, forming puddles in which insects breed.

The lack of latrines in the countryside does not produce serious health problems; however, in the cities the absence of latrines, or latrines poorly maintained and unconnected to any storage pit or sewage line, increases the risk of exposure to disease.

Solid waste

Accumulated garbage in peri-urban neighborhoods exposes animals and children to bacterial contamination, thus increasing the risk of disease. It is not

sufficient to distribute garbage cans and containers and to collect garbage regularly in order to solve this problem; behaviors and attitudes must also be changed, and collective behavior promoting environmental hygiene encouraged. Insecticides contained in garbage piles increase the risks of accidental poisonings.

Food Hygiene

Food hygiene affects people in both their public and private lives. Exposure of food products to the open air, the degree of rigor governing public monitoring, and the biochemical composition of these products are major risk factors. However, it is mainly the exposure of food products within the households and the storage of these products which increases or decreases risk. The example of contaminated mutton from garbage-fed sheep is a significant sign of the impact of a damaged environment on nutrition. Even when food is in short supply, the vigilance with which food poisoning is monitored must be rigorously enforced. Similarly, the reuse of cement sacks for unmonitored uses in Ksibet-Chott is a risk factor to be evaluated.

Exposure to Vector-Borne Diseases

Insects, rodents, and spiders proliferate in peri-urban neighborhoods when basic infrastructure is not made available to all. This situation must be changed by controlling the growth of these districts, through health education and changed behaviors, and by ensuring the existence of minimum conditions of urban life.

.2.2 Post-transition Problems

External and Internal Air Pollution

Neither Kasserine nor Sousse can avoid the problems of external air pollution. In Kasserine, the cellulose plant poses the risk of fumes and chlorine being released, not only into the surrounding neighborhoods but also into the rest of the city. Similarly, the proximity of the industrial areas in Ksibet-Chott, the waste-laden river which encircles them, and pollution of the sea are transforming the environment into a high-risk locality. Throwing the remnants of the cement sacks into the street contributes to air pollution in the neighborhood. The use of wood for heating and cooking inside the cramped houses pollutes the household air and is a risk factor.

Toxic Substances in the Human and Natural Environments

The presence of insecticides in the trash dumps and children's playgrounds is a source of concern for the families in the peri-urban neighborhoods of Sousse. Similarly, the use of plants growing along the road for animal grazing poses a risk of contamination of the livestock and, in consequence, of the meat sold to consumers.

.3 Administrative, Technical, and Organization Officials and Community Participation

Administrative, technical, political, and organization officials cannot successfully manage the clandestine, unplanned growth of the peri-urban districts, nor can they respond to the requests for assistance coming from these areas. These officials are thus confronted with an urbanized population wishing for a safe urban environment, and with a half-urbanized population which, for reasons of survival, remains attached to livestock-raising and, by necessity, to the hygienic conditions of its rural past. Officials must supply the basic infrastructure, which is often incomplete in the peri-urban districts. Furthermore, they must promote, in conjunction with the community, an urban culture in a state of equilibrium with the environment.

These officials can use government legal channels and issue orders. But they can also work through participatory bodies, such as NGOs and neighborhoods committees.

INDIVIDUAL INTERVIEW GUIDE

(Local Authorities, NGOs)

1. How would you describe the environmental conditions in the outlying regions of Sousse/Kasserine?

- Problems
- Difficulties
- Constraints
- In general and in the neighborhood of...

2. Which measures have you taken (have been taken) to deal with the issue of the environment in these neighborhoods?

- Examples
- Experiments
- Evaluations of the programs
- Results

3. In these neighborhoods in general, and in the neighborhood of... in particular, have you involved (has the city involved) the residents in the protection of the environment? Could you tell me about these experiences?

- Type of participation
- Who participated (institutions, individuals, citizens, associations...)
- Evaluations of the results

4. In the working-class districts, have diseases caused by environmental pollution occurred?

- What illnesses? When?
- What measures were taken?

5. Have health campaigns been undertaken in the working-class neighborhoods? Were they linked with the environment?

- Objective of the campaign?
- Results?

6. Has there been cooperation between the different participants in the area of environmental protection?

- In what manner?
- In what framework?
- Results?
- In general and in particular in the neighborhood of...;

7. Could we talk about resources currently available for the protection of the environment in the working-class neighborhoods?

- Human resources
- Physical resources
- In general and in the neighborhood of...

8. Are other resources required for the protection of the environment in the working class districts?

- Are resources programmed?
- In cooperation with whom?
- In general and in the neighborhood of...

9. What do you wish for as regards protection of the environment in the working-class districts?

Thank you.

CIMEP PROJECT

FOCUS GROUP GUIDE (Community)

Introduce yourself, introduce the project and the study

1. I would like for us to talk about cleanliness and hygiene in the home. How do you usually take care of:

- dishes, personal cleanliness, laundry, meals and food, cooking, drinking water, housework, wastewater, latrines, bedding, ventilation of the house, assignment of jobs within the family?

2. Now we'll talk about cleanliness outside the home.

- wastewater pipes, solid waste, air and water pollution, insects, street cleaning, improvement of the environment.

3. What difficulties (problems) do you find concerning cleanliness inside and outside the home?

- material problems, infrastructure

4. Do you think that the environment has an effect on family health? What, in particular?

(Rephrased: what, in your opinion, are the environmental risks which can have an impact on health?)

- heating devices
- housing, construction, physical situation of the home
- types of food
- dishes used to store and prepare food
- water (source, pipes used)
- evaluation
- proximity of sources of industrial harm
- air pollution

5. In your family, do you have cases of illness due to pollution? Who? How were they stricken? Why?

6. What do you think of city steps to protect the environment? and of the municipal agents?

7. What do you think of the behavior of your neighbors when it comes to protecting the environment?

8. In general, do you believe that the environment can cause diseases? Which ones? Why?

9. In your opinion, what human behaviors harm the environment? Why?

- sharing living quarters with animals
- garbage
- wastewater
- chemical pollution
- noise
- industry

10. In your neighborhood, is there an environmental program managed by the municipality? What is this program? What do you think of it?

- goal
- method
- results

11. Does the media show an interest in environmental protection? What broadcasts do you remember?

- source
- method
- messages
- impact
- recognition of the "Labib" mascot

12. In your view, what is the role of authorities as regards environmental protection?

- expectations
- conveniences
- improvements
- local/central authorities

13. How do you hope to see your neighborhood in the future? What will it have? How will it be improved?

- living conditions
- environment
- living conditions for children and the elderly
- social institutions

14. In your opinion, should the community participate in ensuring the cleanliness of the neighborhood and environmental protection?

- in what way?
- participatory methods
- areas in which community participation is possible
- types of participation

Thank you.

ASSESSMENT OF SANITARY CONDITIONS IN THE HOMES SURVEYED

1. IDENTIFICATION OF THE FAMILY

Address _____
Head of household _____
Age _____
Level of education _____
Profession _____
Spouse _____
Age _____
Level of education _____
Profession _____
Number of children _____

Names _____ Dates of birth _____

Educated persons _____ Number _____
Illiterate persons _____
School dropouts _____
Working family members at least 16 years old _____
Specify: Unemployed _____
Principal family income _____
Other income _____
Handicapped people _____

2. PRINCIPAL RESIDENCE

Owner _____
Renter _____
Electricity Yes _____ No _____
Radio Yes _____ No _____
Core set of books _____

3. SANITARY CONDITIONS

a) General Hygiene

Personal hygiene: Yes ___ No ___
Clothes : Yes ___ No ___
Food: preservation of food in the refrigerator Yes ___ No ___
other means of preservation _____

b) Sanitary Conditions in the Home

Number of rooms= Satisfactory Yes ___ No ___
16m/person

Sufficient ventilation	Yes___	No___
Natural light = sunlit	Yes___	No___
Odors	Yes___	No___
Wastewater drainage	Yes___	No___
bathroom	Yes___	No___
clean?	Yes___	No___

IF NOT

Methods of disposing of excreta
 negative well_____

 sewer_____

Disposal of household trash
 containers_____

 Bucket
 in the open air_____

 scattered_____

Presence of insects and rodents

c) Living quarters shared with animals

Types

4. EVALUATION OF HEALTH SERVICES COVERAGE

a) Vaccination coverage

First and last name: date of birth: DTP1/DTP2/DTP3/RA/M1/M2/BCG

b) Prenatal and postnatal doctor visits

Did she see the doctor?_____

Dates_____

c) Assisted delivery_____

Number_____

d) Delivery at home_____

Number_____

e) Family planning

f) Health education

Did she attend sessions?
Number of sessions

5. (CAP)/3 MAJOR NATIONAL PROGRAMS

Vaccination/Anti-Diarrhea Campaign/Perinatality

a) Vaccination

Knowledge of vaccination schedule
Response of the mother

BCG/DTP1/DTP2/ DTP3/Booster M1/ M2/ VAT/
POLIO POLIO POLIO

True or Interest in obtaining vaccinations
False: Interest in obtaining documentation

b) Pre-/Postnatal Care

Her attitude towards prenatal care

c) LAD

Attitude
Rehydration or traditional methods

6. EVALUATION OF THE PARTICIPATION IN COMMUNITY LIFE

Is there a family member who belongs to an association? Which one?

Is there a family member who took part in voluntary service?

How often? Each
year.

Is there a member of the family who goes to:

- a cultural facility?
- a sports facility?
- a political organization?
- a municipal committee organization?
- nature of the work performed

7. STATE OF HEALTH OF THE FAMILY

PNV target disease
Other observed illnesses

8. GENERAL REMARKS