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ENVIRONMENTAL SANITATION: A STUDY OF
ATTITUDES AND PRACTICES

GUATEMALA HEALTH SECTOR ASSESSMENT

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ENVIRONMENTAL SANITATION: A STUDY OF
ATTITUDES AND PRACTICES

INTRODUCTION

Purpose of the Study

The purpose of this study was to examine, through research in several ecologically and ethnically discriminated field sites, the behavior of individuals and groups with regard to environmental sanitation, in the context of the domestic and community environments in which that behavior occurs. The study further sought to elicit some of the reasons for that behavior, as perceived by those individuals and by the field researchers themselves.

Because of an extremely limited time frame, the research was essentially exploratory, designed to provide a preliminary data base and to suggest working hypotheses for either future in-depth research, for baseline investigations prior to technological interventions, or for those interventions themselves. It was designed to offer a first view both of possible barriers -- social, cultural, psychological, and economic -- to the introduction of new environmental sanitation technology, and of elements that might facilitate such introduction or provide suitable points for intervention.

Furthermore, because of the criteria used for site selection, the study was to supply knowledge about ethnic and ecological variation in behavior and behavioral rationales. Finally, it was geared to gather information relevant to the design of technological and educational packages appropriate to the cultural and environmental variation encountered, or at least to recognize that a single package or approach might be suitable.

Research Rationale

There were two major justifications for this research. The first is a consensus that there is a lack of systematic, organized baseline data focussed on environmental sanitation; that there has been very limited evaluation of past programs which would permit more enlightened planning; and, finally, in past ex-post evaluations there has been evidence of different degrees of program success, but no clear clues about what might constitute the elements essential to success or those regularly associated with failure. This consensus was determined through a review of the social science and bureaucratic literature and through interviews with social scientists, sanitation experts, program planners, and field personnel. There was agreement that the available data were largely impressions and anecdotes, scattered pieces of survey data of a quantitative rather than a qualitative sort, and generalized commentaries by health workers and researchers about "poor hygiene levels."

The second justification was that, because of the growing concern for preventive health, funds are increasingly being channelled by the host government, international donors, and private voluntary organizations, into water supplies, latrinizations, and, to a lesser degree, sanitation education. This is occurring without an orderly appreciation of the factors that matter, not only in the acceptance of environmental sanitation programs but continuance in those programs, and of how this acceptance and continuance might vary both regionally and ethnically.

Research Design

Sites

As indicated above, the selection of the research sites was to reflect as much variation as possible in geophysical environment and sociocultural composition. The leading criterion for the former was altitude, considered

by geographers as the single most important ecological variable in Guatemala. The principal sociocultural discrimination was ethnicity, i.e., Indian/Ladino, accounting for subcategories of degrees of acculturation. Sites were selected to harmonize with the regional discriminations employed in other components of the Health Sector Assessment.

The sites originally selected were in: 1) the western altiplano, 2) the northern altiplano, 3) the south coast/Boca Costa, 4) the south coast/Pacific Plain, 5) the eastern desert, and 6) the eastern tropical zone. The population study units included, by choice, a variety of sizes and types, the single constant criterion being enough nucleation to warrant the introduction of community environmental sanitation measures and which indicated that the simple fact of nucleation meant at least the possible existence of an environmental sanitation problem. While very dispersed communities also have to confront issues of environmental sanitation, it is concentration that generates major problems but which also makes it easier, up to a point, to intervene and help solve them.

The sites chosen included, then, rural and semi-rural municipios, aldeas with a concentration of a minimum of 50 families, and one finca site, the last because the finca represents a different geographical, social and political type from other population clusterings in Guatemala. The sites were as follows:

- 1) Soloma - rural cabecera municipal, western highlands, Indian (N=49)
- 2) Soloma - distant aldeas, western highlands*, Indian (N=50)

* The original research design called for a more central highland site and a field worker native to the area had already been identified and committed to the project. Two days before the team was to leave for the field, he withdrew. Making a virtue of necessity we decided to study the aldeas of Soloma as well as the municipio itself, to see what differences might emerge between an Indian municipality and its aldeas in relation to environmental sanitation. There were differences and they appear in the tables.

- 3) Finca Los Andes - coffee finca, south coast/Boca Costa, Indian (N=52)
- 4) Teculután - semi-rural municipio, eastern desert, Ladino (N=50)
- 5) Isabal - aldeas, eastern tropical zone, Ladino (N=50)
- 6) Patulul - cabecera municipal, south coast/Pacific Plain, Ladino (N=25)

The total study population came to 274.

Research Categories

The data collected were in five major categories:

- 1) Disposal of domestic wastes, human and animal, as well as solid wastes;
- 2) The source, transport, storage, quality, and utilization of potable water;
- 3) Pattern of personal and domestic hygiene, including quality of housing;
- 4) Community participation in relation to health and sanitation, and exposure to previous educational programs in the area of preventive health;
- 5) Perceptions of the nature and importance of domestic and community environmental sanitation problems, the adequacy of existing solutions to those problems, if any, and appraisal of alternative technologies.

A copy of the interview schedule is appended to this report.

Research Personnel

Because of the short amount of time available not only for the administration of interviews but for the participant observation and informal discussions with members of a community which so often provide the flesh for survey bones, it was necessary to depend on researchers with prior knowledge of the areas in which they were to work or with good networks established in the communities in question. This intent was fulfilled in all but one case, but that case was instructive; it revealed that people were not only willing

to talk openly about what we had feared were rather intimate and potentially offensive matters, but in fact rather enjoyed doing so, perhaps a tribute to the ageless charm of scatology, perhaps because environmental sanitation is a problem more in the forefront of people's consciousness than previously thought. Openness and interest on the part of those interviewed, in fact, characterized the entire field experience. There were problems of comprehension in areas which will be discussed at the termination of this report which had largely to do with concepts and terms such as the word "hygiene" itself.

Presentation of the Data

The results of the field studies are presented below in very straightforward fashion, essentially under the categories earlier mentioned. Tables are provided where they were felt useful. Information is provided in rounded percents, disaggregated by site in all cases and disaggregated by ethnic group where the difference was meaningful. Because of the sheer mass of material gathered, text has been kept at a minimum.

Use of the Data

Again, because of the quantity of data gathered, not all of it is presented here. The raw data has been conserved for reexamination, as have the breakout sheets, and the raw data will be made available on request to agencies such as Aguas del Pueblo, the GOG, and INCAP for their own purposes. A commitment has already been made to INCAP to provide copies of the finca interviews which they are integrating into their own field research.

CHARACTERISTICS OF THE STUDY POPULATIONSex

The sample population in each study site was selected through simple randomization based on the total number of domestic units. The distribution by sex was to have been a straightforward 50/50 division between males and females. However, due to the shortness of the field period and the lesser accessibility of males away from home working, this distribution was not achieved in every site; the total distribution by sex for the entire sample in all six sites was 40% male and 60% female (see Table I).

TABLE I
DISTRIBUTION BY SEX OF STUDY POPULATION

	<u>Male</u>	<u>Female</u>
Soloma (cabecera)	70%	30%
Soloma (aldeas)	43%	57%
Finca Los Andes	0%	100%
Teculután	42%	58%
Isabal (aldeas)	50%	50%
Patulul (cabecera)	<u>32%</u>	<u>68%</u>
AVERAGE %	40%	60%

Ethnicity

Since the choice of sites had originally been predicated on the determination to study 3 primarily indigenous and 3 primarily ladino sites, this distribution was maintained across the sample, as follows in Table II:

TABLE II
DISTRIBUTION OF SAMPLE, BY ETHNICITY

	<u>Indigenous</u>	<u>Ladino</u>	<u>Transitional</u>	<u>Black</u>
Soloma (cabecera)	76%	22%	2%	0%
Soloma (aldeas)	96%	0%	4%	0%
Finca Los Andes	66%	26%	8%	0%
Teculután	4%	96%	0%	0%
Izabal (aldeas)	20%	78%	0%	2%
Patulul (cabecera)	<u>12%</u>	<u>84%</u>	<u>4%</u>	<u>0%</u>
AVERAGE %	49%	48%	3%	less than 1%

Civil Status

The percentage of the study population that was single was 10%, 43% were married, 39% were living in consensual union, 3% were divorced, and 6% widowed (see Table IIa).

TABLE IIa
CIVIL STATUS

	<u>Single</u>	<u>Married</u>	<u>Consensual Union</u>	<u>Divorced</u>	<u>Widowed</u>
Soloma (cabecera)	6%	69%	23%	0%	2%
Soloma (aldeas)	9%	67%	15%	2%	7%
Finca Los Andes	6%	0%	80%	6%	8%
Teculután	8%	55%	31%	2%	4%
Izabal	14%	31%	43%	2%	10%
Patulul	<u>28%</u>	<u>32%</u>	<u>32%</u>	<u>4%</u>	<u>4%</u>
TOTAL POPULATION	10%	43%	39%	3%	6%

Family Size

The largest percentage of the study population, (54%) have a family size between 5 and 8. Within this group are 57% of the indigenous families interviewed and 49% of the ladinos. Ladinos have more smaller families (33% compared to 28% of the indigenous segment) but also more larger families (18% compared to 15% of the indigenous group (see Table IIb).

TABLE IIb
FAMILY SIZE

	<u>1-4</u>	<u>5-8</u>	<u>9 or more</u>
Soloma (cabecera)	34%	46%	20%
Soloma (aldea)	7%	75%	18%
Finca Los Andes	44%	50%	6%
Teculután	24%	57%	19%
Izabal	36%	57%	7%
Patulul	<u>40%</u>	<u>32%</u>	<u>28%</u>
TOTAL POPULATION	31%	54%	15%

Education

Of the total study population, only 52% had had some primary school; of these 33% were indigenous and 71% ladino. The 1% with more than primary education was resident of Soloma (cabecera) who had gone to vocational school. 47% of the total sample had had no school at all; 66% of those were indigenous and 29% ladinos.

TABLE IIc
EDUCATION

	<u>Some Primary School</u>	<u>More than Primary School</u>	<u>No Schooling at All</u>
Soloma (cabecera)	52%	3%	45%
Soloma (aldeas)	27%	0%	73%
Finca Los Andes	21%	0%	79%
Teculután	80%	0%	20%
Izabal	53%	0%	47%
Patulul	<u>80%</u>	<u>0%</u>	<u>20%</u>
AVERAGE FOR TOTAL POPULATION	52%	0.5%	47%

Language

Language distribution was as might be anticipated, given the choice of study sites. The highest concentration of primarily lengua-speakers was in the rural areas near Soloma; the highest concentration of only Spanish in Teculután and Izabal. Patulul and Los Andes were expectedly transitional and mixed, due primarily to their position and role in Guatemala's migratory labor pattern.

TABLE II
LANGUAGES SPOKEN

	<u>Mainly Indian Language (Lengua)</u>	<u>Mainly Spanish</u>	<u>Only Indian* Language</u>	<u>Only Spanish</u>	<u>Biling</u>
Soloma (cabecera)	59%	27%	0%	0%	14%
Soloma (aldea)	94%	6%	0%	0%	0%
Finca Los Andes	42%	2%	0%	30%	26%
Teculután	0%	2%	0%	98%	0%
Izabal	0%	14%	0%	82%	4%
Patulul	36%	10%	0%	46%	8%

* Everyone interviewed knew a few words of Spanish but use of lengua-speakers was necessary for most interviews in the Soloma area.

Socioeconomic Status and Housing Quality

Because of the selection of the basic study units, the socioeconomic status of the total study population was virtually self-determining. The substantial majority was lower (61%) and lower middle (22%) class; 15% were middle class and 2%, perhaps only relatively speaking, were upper class. Table III shows distribution by site.

TABLE III
SOCIOECONOMIC STATUS OF STUDY POPULATION

	<u>Lower</u>	<u>Lower Middle</u>	<u>Middle</u>	<u>Upper</u>
Soloma (cabecera)	46%	28%	24%	2%
Soloma (aldea)	81%	15%	4%	0%
Finca Los Andes	86%	10%	4%	0%
Teculután	33%	24%	29%	13%
Izabal (aldea)	62%	24%	14%	0%
Patulul (cabecera)	36%	44%	20%	0%
AVERAGE %	61%	22%	15%	2%

Determination of socioeconomic status was made, in admittedly subjective fashion, by each interviewer, using his or her own evaluation based on housing quality, presence or absence of electricity and key household appurtenances, and general appraisal of economic well-being. Table IV displays a distribution of electricity and household goods which in general supports the evaluation of socioeconomic status, with a slight skew for the existence of electricity, largely due to the presence in the sample of three cabeceras with municipal electrification, and one finca with a local source of electricity; an average percentage of 59% electrification is considerably higher than the rural national average of 10%. 64% of the total sample had radios, 13% refrigerators, 11% gas stoves, 61% had elevated cooking arrangements or fogones*, and 27%, almost completely in the indigenous area of Soloma, used floor-level cooking arrangements, with obvious hygienic implications.

As for housing quality, 51% of the total population had dirt and 42% cement floors; 39% had wood and 27% adobe walls; 52% had lámina roofs; 40% had one room only and 35% two rooms; 40% had only one window, with 40% having only two windows; 40% had two and 30% one door; and 47% had an outside kitchen, separate from the rest of the dwelling, 32% in the same single main room, and 20% in another room of the house.

* Generally fueled by wood (leña), although in some areas charcoal is used.

TABLE IV
PRESENCE OF ELECTRICITY AND
SELECTED HOUSEHOLD APPLIANCES

	<u>Presence of</u> <u>Electricity</u>	<u>Presence</u> <u>of Radio</u>	<u>Presence of</u> <u>Refrigerator</u>	<u>Fogón</u>	<u>Floor</u> <u>Stove</u>	<u>Gas</u> <u>Stove</u>
Soloma (cabecera)	69%	65%	14%	48%	44%	6%
Soloma (aldeas)	0%	30%	0%	10%	90%	0%
Finca Los Andes	94%	67%	0%	90%	4%	0%
Teculután	84%	82%	34%	67%	4%	29%
Isabal	34%	50%	0%	85%	6%	9%
Patulul	<u>75%</u>	<u>88%</u>	<u>32%</u>	<u>64%</u>	<u>12%</u>	<u>24%</u>
AVERAGE % FOR ALL SITES	59%	64%	13%	61%	27%	11%

Water Supply

As Table V indicates 45% of the total sample had a water supply either in the house or yard. 14% had access to a neighborhood tap. However, 39% had to obtain water from another source, at varying distances from home; the majority of those who had to carry water were in the municipality and aldeas of Soloma and on the Finca Los Andes, the primarily indigenous sites. Of those who had to carry water, 43% were in Soloma (cabecera), 93% in Soloma (aldeas), 84% on Finca Los Andes, 27% in Teculután, 28% in Isabal (aldeas), and 27% in Patulul. 81% of the water-carrying was done by women, 5% by female children, 4% by men, and 2% by male children. There was some difference by ethnicity, with 86% of women in indigenous sites and 76% of women in ladino sites doing the hauling of water. 34% of all women used cántaros small* and

* A small cántaro holds 10 liters, a large cántaro 20 liters.

TABLE V
WATER SUPPLY

	Tap in House	Private Tap in Yard	Neighborhood Tap	Municipal Tap	Well	Spring	River	Lake	Rain
Soloma (Cab.)	26%	10%	31%	22%	8%	0%	2%	0%	0%
Soloma (Ald.)	0%	4%	24%	0%	39%	20%	12%	0%	0%
Finca los Andes	14%	8%	14%	64%	0%	0%	0%	0%	0%
Teculután	10%	52%	6%	4%	2%	2%	24%	0%	0%
Izabal (Aldeas)	54%	15%	6%	2%	6%	4%	13%	0%	0%
Patulul	48%	28%	4%	0%	12%	0%	4%	0%	0%
Average % in Total Population	25%	20%	14%	15%	11%	4%	9%*		

* Totals to less than 100% are due to rounding and elimination of decimal points.

large, for hauling, 28% used pails, and the balance used tinajas and a mix of other containers.

The balance of the survey population bought water from the municipality at a fixed price, varying from \$0.30 to \$0.50 per month, once the initial installation cost was paid. No one in the sample paid to have water brought in any kind of container such as barrels, tinajas, and cántaros.

Water Storage

47% of the total population used tinajas for water storage; this usage was relatively evenly distributed across the following sites: Soloma (cabecera and aldeas), and Izabal (aldeas). In Patulul, Finca Los Andes, and Teculután, the majority (72%, 65%, and 54% respectively) used primarily pilas for storage; 41% in Soloma (cabecera) use the other principal mode of water storage. Not surprisingly, hygiene procedures correlated in some measure with the size of the storage container used. In Soloma (cabecera and aldea), 83% and 65% of respondents said they cleaned water containers once a day. In Teculután, with a somewhat more even distribution between tinaja (38%) and pila use (approximately 50%), 51% said they cleaned containers once a day and 49% cleaned when the container was empty. However, in Izabal, where 65% of respondents used tinajas for storage, the majority (68%) cleaned these containers only when the water was gone.

Water Storage Hygiene

The percentage of those interviewed expressed the belief that water storage containers should be cleaned was very high, an average of 97% for the whole sample, with the smallest percentage (91%) in Patulul. However, the method of cleaning varies widely (see Table VI).

When asked, for confirmation purposes, if they actually did clean containers every time they became empty, the ladino responses remained high

(Teculután, 91%; Izabal, 94%; and Patulul, 91%). However, the indigenous responses dropped, as follows:

	<u>Cleaned Each Time Empty</u>	
	<u>Si</u>	<u>No</u>
Soloma (cabecera)	49%	51%
Soloma (aldea)	45%	55%
Finca Los Andes	33%	67%

TABLE VI
METHOD OF CLEANING WATER CONTAINERS

	<u>With Water Only</u>	<u>With Soap and Water</u>	<u>With Chemical Cleaner</u>	<u>Other Methods*</u>
Soloma (cabecera)	67%	17%	4%	11%
Soloma (aldea)	83%	10%	0%	7%
Finca Los Andes	19%	30%	0%	51%
Teculután	51%	46%	3%	0%
Izabal	40%	44%	2%	13%
Patulul	0%	50%	0%	40%

* Other methods included, in roughly equal measure, the following: ashes, pashte (a natural abrasive sponge), pashte alambre (a metal scrubber), scrub brush, vinegar, sand, or any combination of the foregoing.

Water Quality: Attitudes and Behaviors

Table VII presents a comparison of attitudes concerning water quality and actual behavior. In all cases except for Soloma there is a correlation between evaluation of water as of good quality and non-treatment of water.

TABLE VII

ATTITUDES AND BEHAVIORS CONCERNING POTABLE WATER

	Evaluation of Quality		Handling of Water		Diferente * Between Evaluation and Handling	Complaints about Water Quality	
	Good	Not Good	Treatment	Non-Treatment		None	All Complaints
Soloma (Cab)	77%	17%	61%	39%	39	35%	65%
Soloma (Ald.)	98%	2%	95%	5%	93	20%	80%
Los Andes	96%	4%	10%	90%	6	62%	38%
Teculután	80%	20%	22%	78%	2	75%	25%
Izabal	96%	4%	16%	84%	12	70%	30%
Patulul	100%	0%	22%	78%	22	91%	9%

* Absolute not percentage difference.

This further correlates with complaints* or lack of complaints about water quality, again except for the Soloma case.

The question is: why, in Soloma, respondents appraise water quality as "good to drink" (bueno tomar como viene), yet have complaints about it and have a high percentage of treatment activity. The reason suggested by field researchers is that Soloma, cabecera and aldeas, has a very active rural health promoter** program which is apparently sufficiently effective to induce its client population to treat their water, despite an initial belief that the water is good 'to drink "as it comes". This discrepancy may either represent a transitional stage in which a behavior change is leading a belief change, or it may mean, that the current behavior will persist as long as the health promoter presence supports it, to be followed by possible reversion if the promoters' support diminishes in any way. Virtually all of the Soloma populations that treated water (cabecera, 94%; aldeas, 98%) boiled it. Table VIIa displays the average boiling times and ranges for all six sites.

* 'Complaints' include: bad taste, bad smell, poor color, containing impurities (suciedades), containing dirt particles (tierra en suspensión), contaminated.

** The promoters were indigenous to the area and had supposedly been trained by the Ministry of Health.

TABLE VIIa
BOILING-TIME AVERAGES AND RANGES

	<u>Average Boiling Time (in minutes)</u>	<u>Range of Time Boiled (in minutes)</u>
Soloma (cabecera)	19	2 to 120*
Soloma (Aldea)	13	5 to 30
Finca Los Andes	25	20 to 30**
Teculután	12	2 to 30
Izabal	11	3 to 30
Patulul	18	5 to 30

* The 120-minute case was unique. Excluding it, the upper end of the range becomes 30 minutes.

** There were only two cases in Los Andes of water boiling.

With the exception of Finca Los Andes, where only two cases of water-boiling were encountered, the range varied from site to site from 2 minutes to 30 (excepting the aberrant case in Soloma (cabecera) of 120 minutes). The average boiling times were from 11 to 25 minutes; averaging again, for the total, 15 minutes. The number of low boiling times (2-8 minutes) was relatively low, but there were a fair number of 10-minute boiling times, which are at the minimum for desirable hygienic practice. There is some indication from participant observation that the quality of the practice is deficient; boiling is not hard enough, contaminated vessels are used, and acceptably-treated water is mixed with untreated water. Given the prevalence of fogonos, where a pot of boiled or boiling water could be maintained daily without extra fuel costs, the educational increment for those already boiling water would seem to be slight.

There was a slightly different pattern in beliefs about whether or not water or lack of water could cause illness (enfermedades). This pattern appears in Table VIIb.

TABLE VIIb
BELIEFS ABOUT WATER AS
CAUSE OF DISEASE

	<u>Water as</u> <u>Cause of Disease</u>		<u>Lack of Water as</u> <u>Cause of Disease</u>	
	Yes	No	Yes	No
Soloma (cabecera)	91%	6%	100%	0%
Soloma (aldeas)	80%	5%	92%	2%
Finca Los Andes	66%	28%	34%	50%
Teculután	68%	30%	86%	10%
Izabal	83%	15%	86%	8%
Patulul	92%	0%*	96%	0%

* Lack of equivalence to 100% due to "no responses/do not know" (no contesta)

There was high degree of perception in Soloma concerning water or the lack of water as being potential causes of illness, to be expected as a result of the health aide activity as mentioned above. There was a similarly high perception in Patulul and somewhat less in the Izabal aldeas; the latter have also been active health aide foci within the radius of the INDAPS training program at Quiriguá, but health aide effectiveness may have been slightly diluted in the last year by earthquake effects. The lowest water-hygiene consciousness was on the Finca Los Andes, correlating with a perception of water "goodness", low treatment

activity, and fewer complaints about water quality. Whether this is a well-founded set of belief and behaviors is an open question.

Those who were asked what illnesses could be caused by water or lack of it responded as described in Table VIII. The percentage of "do not know/do not respond" is very high in the primarily indigenous areas, an average of 82% for the three sites. In the three ladino sites, the average in this category is 40%. Not surprisingly, the degree of reasonably correct information about water-borne diseases was also highest in the ladino groups. No one in either group made any sort of direct connection between lack of water and the ability to achieve any kind of hygiene.

TABLE VIII
ILLNESSES CAUSED BY WATER OR LACK OF WATER

	<u>Do Not Know/Do not Answer</u>	<u>Diarrheas</u>	<u>Parasites</u>	<u>Other</u> *
Soloma (Cab.)	67%	10%	10%	12%
Soloma (Ald.)	86%	8%	6%	0%
Los Andes	93%	7%	0%	0%
Teculután	44%	16%	13%	27%
Izabal	50%	21%	29%	0%
Patulul	26%	4%	22%	48%

* Others included: dehydration, fever, vomiting, colds, stomach aches, typhoid/typhus, cólera, diarrhea, kidney trouble, infections, amebas, blood disorders, rashes (ronchas), malaria, 1st. grade malnutrition, and failure to thrive ("El cuerpo no va").

Some Specific Domestic Uses of Water

In order to arrive at some idea of the realities of domestic hygiene, in addition to those supplied by direct observation on the part of the researchers, the question was asked: "What fruits and vegetables do you wash?" (Qué frutas y verduras lava antes de comerlas?) These responses are shown in Table IX.

TABLE IX
WASHING OF FRUITS AND VEGETABLES

	<u>None</u>	<u>Some</u>	<u>All</u>	<u>No Response</u>
Soloma (Cab.)	0%	2%	98%	17%
Soloma (Ald)	0%	6%	77%	0%
Finca Los Andes	2%	88%	10%	0%
Teculután	0%	2%	96%	2%
Izabal	0%	40%	60%	0%
Patulul	0%	0%	100%	0%

The feeling of the researchers is that these data are reliable in the areas where in general the level of domestic hygiene was higher and where such behavior was part of a set of behaviors, not an isolated hygiene phenomenon. The responses to the question in contexts where the general level of domestic hygiene was low was felt by interviewees answering in the manner expected of them. This in itself

is of interest because it indicates at least a knowledge of supposedly desirable behavior. Respondents were asked a number of questions about clothes washing, primarily to get some more orderly idea about the validity of the frequently heard claim that women prefer to wash clothes at some communal site, instead of alone at home.

TABLE X
CLOTHES WASHING HABITS AND PREFERENCES*

	<u>Where Clothes Washed</u>		<u>Where Prefer to Wash</u>	
	<u>Home</u>	<u>Elsewhere</u>	<u>Home</u>	<u>Elsewhere</u>
Soloma (Cab.)	34%	66%	45%	55%
Soloma (Ald.)	2%	98%	26%	68%
Finca Los Andes	22%	78%	23%	77%
Teculután	40%	60%	29%	71%
Izabal (Aldeas)	83%	17%	68%	32%
Patulul	68%	32%	75%	25%

* 97% of the total sample used soap in addition to water for washing clothes. 2% used some sort of herbs.

There appears to be no consistent correlation between where clothes are actually washed and preference for washing site. However, there are correlations, or perhaps better said, reasons in each site which explain both behavior and preferences.

In Soloma (cabecera and aldeas), there is access to clean warm-water springs which are deemed ideal for washing; in fact, the quantity and quality of the spring water is considered superior for that purpose

to the municipal water supply. In the aldeas there is no domestic water supply and therefore no choice. In Los Andes there is little home washing because there is little domestic water and there is almost perfect correlation between behavior and preference. There was a feeling that washing at home was more hygienic and more comfortable. Women were well aware of the social aspects of washing at the municipal pila: one commented that it was a good place for gossip and another said it was a good place for fights.

In Teculután, although 52% of the sample had taps in their patios and 40% did wash at home, there was high preference for washing at the river for two reasons: most importantly it was more economical and secondly, the water washed better. Those who washed at home and preferred to do so cited reasons of comfort; only one gave hygienic reasons.

In Izabal, where both practice and preference vis-a-vis home washing were high, the reasons were almost invariably that home was easier and less time-consuming, than going to the river to wash. It was also true that the local sedimentation tank was inoperative, thus leaving particulate matter in the system which clogged the meters so that accurate charging for payment of water use was not possible.

Finally, in Patulul where municipal water was available and the river was often dry, home washing was generally practised and preferred.

In sum, it would seem that where domestic level water was not available and there was an acceptable alternative, respondents were not unhappy. Where domestic water is available, however, but there is an acceptable and cheaper alternative, that is preferred. Finally,

where domestic water is available and there is no alternative, people accept it as a fact of life and, in effect, make it desirable.

Thus it cannot be said that there is a widespread social yearning for community washing. If it is a necessity, women seem to make a virtue of it; if it is not, because the technology is available cheaply at home, they again make a virtue of that condition. Since 23% said they washed clothes once a week, 38% twice a week, and 37% once a day, this is a major female activity; there was, however, absolutely no consistent correlation between availability of water at the domestic level and frequency of washing, so that in this regard at least, there would not necessarily be any appreciable hygienic effect from increased domestic water supply.

Personal Hygiene

There was a substantial difference in ideas about bathing between the primarily indigenous and the ladino sites.

TABLE XI
PERSONAL HYGIENE BELIEFS

	<u>Beliefs About Desirable Frequency of Personal Bathing</u>			
	<u>Once a Day</u>	<u>Twice a Week</u>	<u>Once a Week</u>	<u>Twice a Month</u>
<u>Indigenous Sites</u>				
Soloma (Cab.)	20%	51%	29%	
Soloma (Ald.)	3%	76%	21%	
Fincas Los Andes	<u>4%</u>	<u>60%</u>	<u>36%</u>	
Average Total, Indigenous Sites	9%	62%	29%	
<u>Ladino Sites</u>				
Teculután	96%	2%	0%	2%
Izabal	82%	18%	0%	0%
Patulul	<u>64%</u>	<u>24%</u>	<u>4%</u>	<u>8%</u>
Average Total, Ladino Sites	81%	15%	4%	10%

There is a much higher frequency of both perception of the need to bathe more often and actual behavior (89% of the total sample felt they could bathe themselves as often as the expressed desirability) among ladinos than among the indigenous sites surveyed, with the lowest indigenous frequency in Los Andes which makes one feel that while ethnicity is a factor, climate is another. All the ladino sites are in tierra caliente, as in Los Andes; both the need and the desire for bathing more often may correlate better with altitude than ethnicity.

There is no notable difference between the indigenous and ladino samples regarding bathing prescriptions. 36% of the indigenous group and 35% of the ladinos believed bathing when one had a cold was "bad".

(mal). More importantly, 27% of the indigenous sample and 30% of the ladinos believed that bathing when one had a fever was inadvisable. With regard to children, the proscriptions were more numerous and displayed larger percentages (see Table XII).

TABLE XII
BELIEFS ABOUT DANGERS OF BATHING CHILDREN

	<u>Infants under 1 month</u>	<u>Colds</u>	<u>Fever</u>	<u>Children with: Measles</u>	<u>Recent Vaccin.</u>	<u>Purges in Process</u>	<u>Average with so Restrict</u>
Indigenous Sites							
Soloma (Cab)	22%	29%	17%	5%	0%	0%	12%
Soloma (Ald)	13%	32%	9%	2%	0%	4%	10%
Los Andes	<u>0%</u>	<u>20%</u>	<u>21%</u>	<u>20%</u>	<u>19%</u>	<u>18%</u>	<u>16%</u>
Average Total Indigenous Sites	12%	27%	16%	9%	6%	7%	13%
Ladino Sites							
Teculután	12%	67%	10%	0%	0%	0%	15%
Izabal	7%	43%	46%	2%	0%	0%	16%
Patulul	<u>8%</u>	<u>50%</u>	<u>8%</u>	<u>3%</u>	<u>0%</u>	<u>8%</u>	<u>12%</u>
Average Total Ladino Sites	9%	53%	21%	3%	0%	3%	14%

However, except with regard to colds, there were no major differences (over 10 percentage points in any health-related category) between socio-cultural groups in terms of beliefs about when bathing children was risky. Ladinos were twice as restrictive in their bathing of children; this may again be a factor related to climate and in turn to maintaining

the bodily hot-cold equilibrium, still a dominating factor in Guatemalan folk medicine.* The indigenous group was somewhat more restrictive in relation to bathing children with measles, recent vaccinations, and ongoing purges. The profile in general is one of more harmony between ladino beliefs and western medical thinking, than between the latter and indigenous beliefs. The differences, however, are not startling.

General Attitudes About Personal Hygiene

When asked why, in general, it was desirable to keep oneself clean, the categories emerged that are presented in Table XIII, together with their distribution by site. The largest category for both groups was reasons of general health and/or avoidance of illness (total for both groups, 64%). However, only in the ladino group was there explicit connection made between the term "hygiene" and "keeping oneself clean"; at the same time there was ample appreciation in the indigenous group of the physically and psychologically beneficial aspects of hygiene. It may be that use of the term "hygiene", itself, in health education is not a particularly relevant usage nor compatible with indigenous lexicons, and that health educators might better talk in terms of health and physical and psychological well-being

* There were a number of random comments in both areas about the desirability of avoiding extremes of water temperatures, bathing when perspiring heavily, and "aire" (strong).

TABLE XIII
ATTITUDES ABOUT THE DESIRABILITY OF PERSONAL HYGIENE

	For more General Health Reasons	Avoids Illness	Remove Dirt Smells	For Reasons of Hygiene	Don't Know	Just Generally Good	Not to be Bored	One Feels Fresh	One Feels Tranquil	Children Grow Better
Soloma (Cab.)	18%	71%	3%	0%	0%	0%	0%	3%	5%	0%
Soloma (Ald.)	36%	0%	56%	0%	0%	3%	0%	3%	3%	0%
Finca los Andes	47%	0%	0%	0%	30%	3%	17%	0%	0%	0%
Teculután	64%	0%	17%	13%	2%	4%	0%	0%	0%	0%
Izabal	41%	43%	14%	0%	0%	2%	0%	0%	0%	0%
Patulul	31%	31%	0%	27%	0%	7%	0%	4%	0%	0%
	40%	24%	15%	7%	5%	3%	3%	2%	1%	.3%

Handling of Used Household Water*

The average behavior regarding disposal of used household water is to throw it out into the portion of the patio or milpa nearest the door, usually the back door. If an area with growing things happens to be in the line of fire, of water, it benefits from the added moisture; there is virtually no conscious, consistent intent to use household water for milpas or hortalizas. See Table XIV for detail.

For both indigenous and ladino groups, the prime target was the yard, primarily the back yard. For the indigenous group, simply because they cultivate it, the secondary target is the milpa. Only 1% of the indigenous group and 5% of ladinos -- in Teculután where there is a generally more widespread sophisticated agricultural knowledge, due primarily to its easier accessibility to extensionists and the presence of a number of medium-size commercial agro-businesses.

The dumping of used household waters into wells and rivers (a total of 10% of both samples, in approximately even distribution) is the only clearly negative hygiene practice. Hygiene education efforts should stress the elimination of this practice, encourage application of used household waters to doorside plantings, accept the domestic value of water dampening down dusty yards, and ignore the rest.

* Not human waste-bearing waters (aguas negras), but the waters used for personal and domestic hygiene.

TABLE XIV
DISPOSAL OF USED HOUSEHOLD WATER

	Yard	Street	Milpa	Open Field	Well	River	Watering Plantings	Hole or Ravine	Other
Indigenous Sites									
Soloma (Cab.)	0%	20%	42%	2%	12%	2%	0%	6%	14%
Soloma (Ald.)	6%	0%	78%	6%	0%	2%	0%	2%	2%
Los Andes	70%	0%	0%	0%	2%	0%	2%	26%	0%
Average Total for Indigenous sites	25%	7%	40%	3%	5%	1%	1%	13%	5%
Ladino Sites									
Teculután	12%	6%	2%	8%	2%	2%	12%	10%	44%*
Izabal	56%	4%	4%	32%	0%	2%	4%	0%	2%
Patulul	15%	4%	0%	8%	0%	4%	0%	12%	58%*
Average Total for Ladino Sites	28%	5%	2%	16%	1%	3%	5%	7%	35%

* These refer almost totally to municipal sewer drains.

TABLE XIV-a
SOLID WASTE DISPOSAL

	Nothing Special	Burn	Bury	Throw in Patio	Throw on Property	Compost	Throw no Special Place
Soloma (Cab.)	2%	2%	0%	6%	16%	60%	14%
Soloma (Ald.)	2%	0%	0%	0%	59%	35%	2%
Los Andes	4%	47%	4%	7%	2%	0%	35%
Teculután	0%	66%	0%	2%	10%	2%	20%
Izabal	2%	43%	16%	6%	18%	2%	12%
Patulul	0%	40%	0%	4%	12%	4%	40%

Solid Waste Disposal

Solid wastes are handled differently in indigenous and ladino areas (see Table XIVa). In Soloma (aldea and cabecera), 50% of the respondents add their biodegradable wastes to their compost heaps, separating out what is not biodegradable and throwing it in the patio (see Table XIVb). In ladino areas and in Los Andes solid wastes are generally burned or thrown on the property; there is virtually no use of composting in ladino areas nor is the knowledge level high (see Table XIVc). Only in Soloma (cabecera and aldea) and Patulul do the majority of those interviewed consider compost an effective fertilizer; in the other sites an average of 48% do not know what composting is.

Thus it would seem that efforts to use composting as a solid-waste disposal technique might have a good sociocultural base in indigenous areas; in ladino areas, to initiate such approaches would be to begin at ground Zero.

TABLE XIVb
COMPOST HEAPS

	<u>Have</u>	<u>Are not</u> <u>Agriculturists</u>	<u>No</u> <u>Acquaintance</u> <u>With</u>
Soloma (cabecera)	76%	2%	2%
Soloma (aldea)	65%	-	-
Fincas Los Andes	4%	2%	34%
Teculután	20%	-	-
Izabal	7%	-	7%
Patulul	4%	-	-

TABLE XIV-c
KNOWLEDGE ABOUT AND ATTITUDES TOWARD COMPOSTING

	Does not Know	Propagates Insects	Attracts Animals	Damages Crops	Is good	Is better	Other
Soloma (Cab.)	2%	0%	2%	0%	81%	0%	6%
Soloma (Ald.)	4%	2%	0%	0%	65%	6%	2%
Los Andes	67%	0%	0%	0%	33%	0%	0%
Teculután	44%	2%	4%	0%	26%	16%	8%
Izabal	32%	0%	0%	0%	46%	7%	0%
Patulul	32%	0%	0%	0%	60%	0%	0%

Disposal of Animal Excrement

In Soloma (cabecera and aldea), 65% of the suspects interviewed collect animal excrement to use as fertilizer, while in the other four sites this is rarely done. The general attitude, however, in all sites, is that animal excrement is excellent fertilizer; the reason it is not used is that either the suspects do not plant or feel that fertilizer is not really necessary in their particular area.

Attitudes Toward Insect Pests

Somewhat surprisingly, or at least contrary to an opinion in public health circles that seems to be generalized, the perception of insect pests as transmitters of disease is relatively high. Soloma (cabecera and aldea) has already been cited as an area where health promoters are active and appear effective, but there is at least 50% awareness in Patulul and Teculután (see Table XIVd). However, only a very low percentage in any area know what diseases are borne by insect pests or other animals, especially the ubiquitous pig, nor is there any idea of behavior that is achievable, given scant economic means to combat such pests, with the possible exception of food covering to avoid microbios. Insecticides are frequently cited as effective but few can afford them.

Level of Household Hygiene

The general level of household hygiene is represented in Table IV. The practice of covering food containers is uniform, with the exception of the finca environment of Los Andes. The covering of water containers, however, shows a marked separation between indigenous and ladino sites. The relatively low rates of coverage in the indigenous sites (Soloma (aldea and cabecera) and Los Andes) have significant implications for probable

TABLE XIV-d
ATTITUDES TOWARDS INSECT PESTS

	Transmit Disease	Sting	Harmful to Health	Other	Contaminate Food	Do all Mentioned	Disgusting	Dangerous	Irritants
Soloma (Cab.)	67%	2%	8%	4%	6%	12%	2%	0%	0%
Soloma (Ald.)	66%	4%	0%	2%	2%	4%	4%	0%	0%
Los Andes	10%	39%	2%	27%	8%	10%	2%	0%	2%
Teculután	64%	8%	7%	8%	2%	0%	8%	4%	0%
Izabal	32%	8%	36%	0%	6%	2%	8%	8%	0%
Patulul	<u>50%</u>	<u>17%</u>	<u>13%</u>	<u>13%</u>	<u>4%</u>	<u>0%</u>	<u>0%</u>	<u>4%</u>	<u>0%</u>
Average of total Population	48%	13%	11%	9%	5%	5%	4%	3%	.5%

5.15-36

TABLE XV
LEVEL OF HYGIENE

	Cover Food	Cover Water Containers	Pigs in House	Garbage Separation	Children Wear Shoes	Women Wear Shoes	Men Wear Shoes	Level of Household Hygiene		
								Good	Average	Poor
Soloma (Cab.)	96%	57%	10%	91%	89%	96%	96%	8%	92%	-
Soloma (Ald.)	91%	53%	9%	31%	44%	71%	42%	5%	95%	-
Los Andes	45%	0%	6%	0%	39%	65%	86%	-	43%	57%
Teculután	92%	91%	0%	0%	39%	62%	50%	75%	21%	4%
Izabal	88%	71%	19%	33%	74%	67%	70%	20%	51%	29%
Patulul	100%	100%	0%	100%	88%	71%	89%	84%	16%	-

water contamination, especially by insects and dust. In other words, water may be potable at the moment it leaves the tap, but the handling and storage practices in the majority of these households virtually assure contamination. Therefore, if water is not properly handled or stored, there is no point in installing potable water systems.

Dirt Floors as a Hygiene Problem

Because of the prevalence of earth floors in both rural and urban environments and because of the potential they offer for disease transmission especially among young children, the interview schedule contained a question about attitudes toward dirt floors. Some researchers had encountered attitudes that were essentially favorable toward dirt floors as being more comfortable, cement floors as being cold and bad for the health, and easier to keep clean. The categories which appear below in Table XVa are those which were volunteered, i.e., constructed themselves by respondents in answer to an open question; they were not imposed by the interview schedule or the interviewers.

When asked if they liked dirt floors, respondents often answered affirmatively, interestingly not only in indigenous areas where more positive responses were anticipated (see Teculután, a relatively sophisticated and prosperous rural municipio). However, when asked for reasons why they did not like dirt floors or if they thought dirt floors represented a source of illness, there was a high number of answers which indicated that the dirt floor was seen as a potential source of illness, and that essentially economic reasons ("material more abundant" in indigenous areas and "because we are poor (gente humilde) in ladino areas) were those offered as the reasons for having such floors. The lowest perceptions of dirt floors as

TABLE XVa
ATTITUDES TOWARD DIRT FLOORS

	Like Dirt Floor	Dirt Floors Cause Disease	Last Longer	Cheaper	Material More Abundant	More Comfortable	Healthier	Because we are Poor
Soloma (Cab.)	38%	94%	0%	8%	58%	0%	0%	25%
Soloma (Ald.)	57%	89%	0%	3%	93%	0%	0%	3%
Los Andes *	0%	66%	0%	0%	0%	0%	0%	0%
Teculután	58%	93%	0%	20%	10%	10%	0%	50%
Izabal	52%	80%	5%	40%	15%	15%	10%	0%
Patulul	23%	23%	0%	0%	25%	25%	0%	75%

* Los Andes was, as in many other instances a special case since the finquero had installed cement floors.

disease transmitters were found on the Finca Los Andes where, it has already been observed, the sense of hygiene was generally lower than in any other site, and in Patulul.

Latrinization

TABLE XVI
DISTRIBUTION OF LATRINES

	<u>Have</u>	<u>Do not have</u>	<u>Sharing</u>	<u>Want</u>
Soloma (cabecera)	71%	29%	56%	92%
Soloma (aldea)	12%	88%	14%	100%
Finca Los Andes	6%	92%	6%	37%
Teculután	72%	28%	31%	100%
Izabal	66%	34%	5%	94%
Patulul	83%	17%	17%	100%

Soloma and Teculután both have the same percentage of latrines, yet sharing with households who do not have latrines is higher in Soloma than in Teculután. In Soloma (aldea) and Los Andes, where the percentage of latrines is low, there is also very little sharing (14% and 6% respectively). There is a consensus, with the exception of Los Andes, that it would be desirable to have a latrine. The reason given in Los Andes for not wanting a latrine is that they cost too much and they are not necessary.

Motivation for Wanting Latrines

Table XVII shows the distribution of motivation for wanting latrines. It is clear that for the large majority of the total population (range 78 to 100%), latrines are associated with and considered desirable for

reasons of health and cleanliness. Only in indigenous areas is some consideration given to comfort.

TABLE XVII
MOTIVATION FOR WANTING LATRINES

	<u>Better Health</u>	<u>Comfort</u>	<u>Cleanliness</u>	<u>Other*</u>
Soloma (cabecera)	21%	21%	57%	0%
Soloma (aldeas)	5%	7%	79%	0%
Los Andes	0%	6%	0%	39%
Teculután	20%	0%	70%	10%
Izabal	47%	0%	6%	47%
Patulul	20%	0%	60%	20%

* This category principally includes health-related responses consisting of disease prevention and the naming of specific illnesses.

Types of Latrines in Use

Table XVIII shows the percentage distributions of types of latrines used by the study population at the time of the interviews. The most prevalent is the private pit latrine, followed by the shared pit latrine.

TABLE XVIII
TYPES OF LATRINES

	<u>Private Pit Latrine</u>	<u>Shared Pit Latrine</u>	<u>Flush in House</u>	<u>Simple Hole</u>	<u>Flush Outside</u>	<u>Other</u>
Soloma (cab.)	30%	19%	7%	24%	12%	0%
Soloma (aldeas)	27%	45%	0%	18%	9%	0%
Los Andes	4%	15%	8%	0%	0%	0%
Teculután	49%	3%	44%	0%	5%	0%
Izabal	79%	3%	3%	10%	3%	0%
Patulul	<u>25%</u>	<u>0%</u>	<u>15%</u>	<u>0%</u>	<u>0%</u>	<u>60%*</u>
AVERAGE FOR TOTAL POPULATION	36%	14%	13%	9%	5%	10%

* This type is a cement latrine connected to a municipal drain flushed drain water from the household pilas.

Latrine Accessories

The latrines in use in all six sites were mostly (over 80%) equipped with cover, walls and roof, as well as a seat on a concrete or wooden base.

In all areas the consensus was that seat, cover, and walls were necessary. The seat was perceived as necessary for both comfort and cleanliness, walls were obligatory in all cases to preserve privacy, and the cover as having the function of reducing odor and the number of insects.

Levels of Satisfaction with Existing Latrine Facilities

The levels of satisfaction seem to vary inversely with the number of latrine facilities. In Soloma (cabecera) and Patulul, where 71% and 83% respectively have latrines, the levels of dissatisfaction were 63% and 76%. On the other hand, in Soloma (aldea), Teculután, and Izabal, where latrine facilities are at 12%, 66%, and 83% respectively the levels of satisfaction are 82%, 87%, and 91%. These differences are significant in that the higher rates of dissatisfaction in Soloma (cabecera) and Patulul would seem to represent a desire for a better latrine.

The improvement in facilities most frequently desired is the construction of municipal drain systems or septic tanks.

Latrine Location

An extremely relevant, but much neglected factor, is where to place the latrine. The preferences compiled in this study show considerable variation from site to site, a variation which is meaningful for program design.

In the indigenous sites of Soloma (cabecera) and Soloma (aldea), 70% and 83%, respectively, indicated a preference to have the latrine as close as possible to the house. In the four other sites, the preference was to place the latrine at a good distance (over 25 varas) from the dwelling (see Table XIX).

In the indigenous area the preference for closeness is important to assure that the latrine gets used both day and night. In Los Andes, Teculután, Izabal, and Patulul, the preference is for latrines to be at least 25 varas from the house, yet the data indicate that in actual practice they are closer. This may indicate that location may have been arbitrarily

selected without reference to local preference. Furthermore the level of satisfaction with the latrine may prove to be closely related to location, as well as to the type of latrine in actual use.

TABLE XII
AVERAGE DISTANCE IN VARAS TO LATRINE

	<u>Average Estimated Distance</u>	<u>Attitude Concerning Distance</u>
Soloma (cabecera)	15-20 varas	too far
Soloma (aldeas)	35 varas	too far
Finca Los Andes	20 varas	satisfied
Teculután	10 varas	too close
Izabal	15 varas	too close
Patulul	10 varas	too close

Households Without Latrine

In the households without latrines or which do not share with neighbors, there is no differential across the total sample with regard to the site presently used to defecate. The data do, however, show an age differential. Adults generally defecate in the same generalized area, at a considerable distance (when possible) from the house, with marked preference for hidden spots in open countryside or in far corners of a milpa. Younger children (under 10), however, defecate randomly near the dwelling, often on the edges of open patios. Before entering communities with no or few latrines, with a latrinization program, a simple survey of site preferences for latrine location would seem advisable.

Communication

In all six sites, 50% or more of the respondents had never heard, read, or seen any programs dealing with sickness, origin of disease, or the prevention of disease. An average of 65-70% of those interviewed had never received any information from either rural health promoters or rural health aides.

The sites with the least exposure to media and promotion personnel were Soloma (aldea and cabecera) and Los Andes; Teculután, Izabal, and Patulul had had, on the average, 10-15% more contact with both media and outreach personnel. Let it be emphatically stated that over 50% of all respondents had received no information, even when they were located in areas where programs disseminated by mass media, especially radio, exist. These sites are also located in areas where programs by rural health promoters and health aides are also being carried out.

Of the subjects who had received information, an average of 71% say they have utilized what they learned in actual household practice. They also felt that the quality of programs and information had been good.

85% of the suspect population, at all sites, expressed interest and desire to receive information in the form of courses by trained personnel, especially in the field of environmental sanitation.

One has, of course, to be wary. The purpose of the household interviews had been stated at the outset and it would not be surprising if some of this response reflected a desire to please the interviewers, who achieved generally good rapport with the respondents. However, no overt cynicism or passionate lack of interest was demonstrated in any interviews, so a basic amenability, if not rampant enthusiasm, may be

assumed.

Participation in Community Projects

Table XX is a breakdown by project type of the groups who have participated in community development activities, and of the kind of projects desired by groups who have not hetherto participated but would be so disposed.

In Soloma (Cab. and Aldea), the predominant project types in which people have participated are these relating to environmental sanitation, school building and various health-related projects (mostly health post construction). This generally holds true for the ladino areas of Teculután, Izabal, and Patulul.

The sorts of projects in which respondents indicated most disposition to participate were related to environmental sanitation (especially latrinization), followed by health and education projects (see Table XX). In other words people in the five sites have defined a need for environmental sanitation projects and express a willingness to participate in them. The predominant mode of participation in Soloma (Aldea and Cabece-
ra) and Izabal has been the contribution of manual labor, while in Teculután and Patulul participation has been in the form of limited monetary contributions and attendance at planning sessions.*

Interviews with community leaders* have shown that in past projects, people have been very reluctant to contribute manual labor free of charge. To a man, the mayors of the sites studied expressed grave skepticism about the potential for free labor in future projects. They also claimed that monetary contributions have been virtually

* The alcalde in all sites but Finca Los Andes were interviewed in semi-structured fashion concerning the history of participation in community projects past, present, and future, and problems encountered.

TABLE XX
PARTICIPATION IN COMMUNITY DEVELOPMENT PROJECTS

	Have Participated	Have not, but wan to	Speciall Int.in Environmental Sanitation
Soloma (Cab.)	27%	97%	92%
Soloma (Ald.)	15%	94%	98%
Los Andes	----	----	----
Teculután	24%	75%	86%
Izabal	22%	79%	81%
Patulul	20%	55%	72%

TABLE XXI
PROJECTS IN WHICH COMMUNITY MEMBERS HAVE PARTICIPATED AND WANT TO PARTICIPATE IN

	Health	Education	Recreation	Environ- mental Sanitation	Public works	Churde or Temple	Other	Combinations
Soloma (Cab.)								
Have	8%	0%	0%	62%	8%	0%	15%	8%
Want	14%	23%	2%	30%	7%	3%	3%	17%
Soloma (Aldea)								
Have	12%	12%	0%	38%	12%	0%	25%	0%
Want	7%	14%	0%	66%	0%	2%	2%	9%
Teculután								
Have	10%	0%	0%	70%	0%	10%	10%	0%
Want	7%	28%	3%	28%	10%	14%	3%	0%
Izabal								
Have	15%	23%	0%	23%	8%	8%	23%	0%
Want	23%	23%	0%	11%	14%	14%	0%	14%
Patulul								
Have	20%	0%	0%	40%	0%	0%	20%	0%
Want	33%	25%	0%	17%	0%	0%	8%	0%

non-existent in the past and that there is no reason to believe that the situation will change in the future. The strong possibility of having to utilize remunerated manual labor must therefore be seriously considered in any and all future project planning.

SUMMARY FINDINGS AND RECOMMENDATIONSGeneral Recommendations

The experience of administering this survey and of community observation affirms that it is both possible and useful to do so. People are willing to respond to the rather personal questions subsumed under the rubric 'environmental sanitation', seem to feel that it is an important subject, and frank in their responses.

It is recommended that such observation and a more reduced version of this survey precede intervention in any community with an environmental sanitation program. Projects in which AID is involved should include money for a small survey, a leadership interview, and some guided observation. This can be done in a week and should not cost over \$200 per site.

There are meaningful variations between Indian and ladino sites which will be reviewed briefly below and it does not appear that the same environmental sanitation package will serve for both site types.

While individuals who do not have water piped to their domestic site do not pay to have water brought to them in another fashion (e.g., cart or head-load), they are apparently willing to pay a small amount per month for piped water. They are aware of the time and effort involved in carrying water themselves and see the tradeoff between time and money payments quite clearly. The problem would arrive for most low-income families in getting together any lump sum for initial installment, so any potable water intervention would have to incorporate amortization of initial costs over some time period.

Almost consistently, the lowest levels of knowledge about environmental sanitation behaviors and hygiene were found on the finca. Since the finca in question is superior in many ways to many other fincas, we can only assume

that the situation there is even worse. It may be that the best intervention with regard to finca health might be in the area of environmental sanitation; in such an environment, curative health approaches are even more useless in vacuo than is customarily the case.

Community washing arrangements are a neutral technology or arrangement for most individuals and there seems to be little discontent about the need to wash clothes in such sites. Women are often pleased to be able to wash at home but will ignore the convenience for economy's sake. This is an area where virtue is made of whatever necessity. The same is not true of carrying water; this is seen as cost.

Solid waste disposal, as hypothesized by the researchers, varies noticeably between indigenous and ladino areas, suggesting that two types of technological intervention in this area are suitable. If village solid-waste disposal technology is to become a reality, this research suggests that in indigenous areas the technology be based on an existing practice, culturally and agriculturally valued, i.e., that of composting. Ladinos, even in agricultural areas such as Teculutén, do not use composting nor do they value it, and alternative technologies to composting should be used. The garbage truck or carting to some central burning area seems to fit most closely with ladino thinking and behavior.

There would be general receptivity to an intervention, particularly a low-cost intervention, that would include covering of dirt floors, either with regular applications of new dirt or with some sort of indigenous mortaring substance. Dirt floors are seen as disease transmitters, though the process is far from understood, and perhaps even more acutely as "the poor man's floor". While it is articulated differently in Indian ("earth is

a more abundant material") and ladino ("because we are poor") commentaries, the underlying justification for having a dirt floor is simply poverty.

In the indigenous population, latrines tend to be associated with cleanliness and in ladino areas with better health. Indians, rather surprisingly, also mentioned issues of comfort as a motivation for wanting a latrine but this was a small percentage and mainly in the municipio.

In all areas, the typical appurtenances of latrines -- seat, cover, and walls -- were viewed as necessary.

Levels of dissatisfaction with existing facilities, were higher in the case of pit latrines, the more facilities there were. This suggests that once people had latrines, they wanted "better" ones. A "better" one was a ceramic flush toilet ("porcelana y lavable") and this did not seem to vary meaningfully between Indian and ladino areas. Those who had latrines found them smelly and hard to keep clean. The solutions suggested by some respondents in municipalities, both Indian and ladino, was connection of latrines to municipal drain systems or septic tanks, a relatively sophisticated concept which may not be widespread.

The other technological modification to latrines which was suggested is the ceramic finish. A low-price glazed commode for rural latrines has been designed for Colombia and should be investigated as a possibility for Guatemala. There is reason to believe that it would be accepted in both Indian and ladino contexts, largely because it is easier to keep clean.

Shared latrines, even in Indian communities, do not seem to work very well or make people very happy. They should not be continued as a solution.

Preference for latrine location differs noticeably between Indian and ladino communities. Indians appear to want the latrine as close to the house as possible and see the latrines they have as too far away. Ladinos want the latrine as far from the house as possible, and see the ones they have as too close.

The level of contact through any medium on the subject of environmental sanitation is quite low, particularly in indigenous areas and on the finca, but the level of interest is high. Respondents seemed aware that they did not know how to cope with problems of the environment and that no one had told them very much about how to do so. The majority also felt that they were practicing the little they had been told, but some admitted to not doing so. As usual, one has to be wary of expressions of interest, since positive responses are usually given out of courtesy to the interviewer, particularly if it is someone known and liked.

There had been some participation in the survey population in environmental sanitation projects, as well as in relation to health-facility and school construction, both in Indian and ladino sites. There was interest expressed in latrinization in general. However, it must be said that in no case was interest in potential community involvement overwhelmingly high. Interviews with the alcaldes in all sites (except Finca Los Andes) suggested that in the future manual labor on community projects would have to be at least minimally rewarded, preferably with cash. Studies in the agricultural sector suggest that corn might be an acceptable form of payment. The CARE experience should be evaluated to see if a Food for Work component has been included and to what degree it has been successful. If, however, the reward of project activity "come to the door" as, for example, with regard to

potable water or latrines which are wanted, the materials might be sufficient reward for the labor exchange.

This finding suggests that before any community intervention is undertaken of any sort, that the community be thoroughly involved from the beginning in project identification, design, and implementation. If there is increasing resistance to "working for nothing", and this would not be surprising given the ever-worsening economic situation especially in the highlands, it is even more crucial that the community be integrated into project activity from the outset and that the rewards are clearly articulated and perceived.

Environmental Sanitation Education

It is almost trite to say that the level of education about environmental sanitation is low. However, what emerges from the field study is not so much that it is evenly low but that the knowledge level has two principal characteristics: 1) it is uneven with consciousness in some areas being quite high and in others totally absent; and 2) in some areas where consciousness is high, the reasons are not truly understood and tend to be based on a sort of rote indoctrination. Finally, even where consciousness is high, there is an economic or environmental impediment to compliance with one's own belief.

The following areas are those in which educational intervention or modification seem crucial:

Water storage.

1. Pila storage is relatively common and far more difficult to deal with. It is hard to cover a pila and protect it from dirt, insects, chickens, and other animals. Pilas are also hard to clean and in practice rarely are, since it is difficult to clean them without emptying them and accepting the attendant water loss.

Unless some appropriate technology is found for pila coverage and education about cleaning them is introduced, a high rate of water contamination from that type of storage may be expected to persist.

2. The consciousness for the need to clean storage tinajas appears high but the methods used are inadequate. Education to attend to issues of "how".

3. The Soloma case indicates that with persistent, dedicated rural outreach activity, even though people believe their water is "good", they can be persuaded to boil it. Because of the long period in which water-boiling has been at the core of preventive health thinking and teaching, there is a generalized knowledge of this as, for some reason, a desirable behavior. However, the conceptual linkages between a given water supply as providing water that is bad to drink, what "bad" really means, and how and why one should behave about it do not seem clear. This explains why the same individual will boil water an insufficient amount of time, add unboiled water to it to cool it down for a baby, why boiled water containers are not covered, or why containers for boiled water are not properly prepared.

Until there is piped potable water to each Guatemalan house, water-contamination will continue to be a problem. Emphasis on boiling has been criticized because of supposed implications for deforestation. However, the fact is that in campesino homes with fogones, increasing in number, a fire is going much of the day, and at least in the morning. Individuals can be taught not just how to boil water but how to fit the boiling practically into their schedules, available utensils, use of fire for other cooking, etc. Boiling should be taught as a behavior integrated into existing behavior, not as additive, and its mechanical effect explained as such.

4. There is a very low knowledge level concerning the nature of the diseases carried by water. People simply do not understand how water can make them sick and in what special ways.

5. Even with regard to responses about which interviewers were suspicious (e.g., fruit and vegetable-washing), based on discrepancies between answers and observed behavior, the fact that respondents gave a hygienically "correct" answer indicates a level of consciousness that is higher than public health workers commonly believe.

However, the consciousness is not sufficiently internalized to consistently govern behavior, which would suggest that what has often been observed in Guatemala is indeed the case: germ theory is not really believed nor has it been integrated into existing belief systems, especially in the indigenous population. It is not a question of being unable to believe in the invisible -- the Indian spirit world is well populated and all nature is imbued with a variety of invisible forces. It might not be a bad idea to accept the fact that this belief system will endure and attempt to join it rather than beat it. Microbes could simply join the existing hosts of invisible forces that act for good or ill in human existence and be combatted or prevented within that framework but with slightly varying mechanisms.

In terms of education, the major problem related to personal hygiene seems to lie less with general bathing but with bathing under specific disease situations, specifically fever conditions, where bathing might not only be desirable but crucial. This derives from the system of hot-cold beliefs and if education were integrated with restorative herbology, it might be possible to change bathing practice under situations of illness.

There was great suspicion on the part of the interviewers that the high positive responses to questions about tooth-brushing were what the interviewee thought the questioner wanted to hear. Thus there is generalized knowledge that it is good to brush one's teeth but the behavior itself does not appear generalized. Apparently people do not either believe it is really necessary or the costs are in some way too high.

There was a well-distributed lack of understanding of the term 'hygiene'. Since it is not that important that the term be used, it might be well forgotten as part of environmental education. People understand "clean" very well and consider it a desirable state, while not always easy to maintain. There is not a widespread desire to be dirty. Thus education programs should be predicated on the fact that people would like to be clean; if they are not, they either do not understand certain Western meanings of the term 'clean' or it is economically or physically impossible for them.

Used household water is generally wasted. This is crucial during dry periods when plantings might be affected. Part of community environmental sanitation could well be the incorporation of the idea of reutilization of used water. The costs of carrying water are well understood and could serve as a base for conservation practices.

It is also well understood that insects carry diseases. However, ignorance of what insects carry what diseases is widespread. Thus insects are combatted in proportion to their capacity to annoy. Flies are less annoying than other insects so the human counterattack is less vigorous. Thus food and water are left uncovered, though covering of food, while erratic, is more common than not.

It is also not known what diseases animals carry. There is some concept that pigs might carry disease but only because they look dirty.

Animals that look clean do not carry disease. Furthermore, what diseases pigs might carry is unknown.

The concept of water-covering varies widely between Indian and ladino areas. It is high (supported by both survey questioning and observation) in ladino areas, very low in Indian areas. The incompatibility between a superimposed behavior of boiling water and then not covering it displays the degree to which this whole system of concepts is only fragmentarily understood.