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NOTES ON WOMEN IN DEVELOPMENT NO. 18  
(Case Studies)

NICARAGUA RURAL SANITATION PROJECT

KD 5485 JSN 200g

This case study is one of a series prepared expressly for discussion by World Bank staff in workshops on women in development. It is in no sense an evaluation of the project, and describes only those of its features which are relevant to the concerns of the workshop.

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CASE STUDY

NICARAGUA RURAL SANITATION PROJECT

(Cr. No. )

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## NICARAGUA RURAL SANITATION PROJECT

(Cr. No.     )

### I. THE COUNTRY CONTEXT

1.           Nicaragua is the largest country in Central America and is known as the land of lakes and volcanoes. It lies between Costa Rica on the south and El Salvador and Honduras on the north. It is on the western rim of the Ceribbean Sea and on the Pacific Ocean. The country can be divided into three regions: the West which includes the heavily populated Pacific Highlands and the lowlands and lakes of the Great Rift Depression; the Central Highlands with its growing population toward the north and west; and the uninhabited forests of the Caribbean Coastal Plains. The Central Highlands are extensions of the mountain ranges which begin in southern Mexico. The Highlands are separated from the Western new volcanic mountain ranges by the Great Rift Valley. The Valley contains Lake Managua and Lake Nicaragua the largest bodies of water in Central America. Nicaragua's climate is tropical, with a median temperature of 26 C (79 F) and a minimum temperature of 20 C (68 F).
  
2.           The northwestern part of the Rift Valley and the Pacific slope contains the capital Managua, the principal seaport Corinto, and most of the small towns and cities. In this region are found also almost all of Nicaragua's industry, the major communications and transport facilities as well as a large part of the rural population and agricultural production. A second important economic area, (with Matagalpa, the regional capital and third largest city) is developing in the western part of the Central Highlands where almost all the rest of the important agricultural areas and production is. The population is growing rapidly but to connect it with the rest of the country the area

needs better surface transport facilities. Their construction has been delayed because of the rugged terrain.

3. The country is divided into 6 regions and 16 provinces. The provinces are subdivided into 126 municipalities or townships and 5,000 villages. The largest city is Managua, the capital city with a population of 636,900. (Census Bureau Estimate for 1980). The villages range in size from those with dispersed populations of less than 50 people to clusters with populations up to 1,000. In 1980 the estimated population of Nicaragua was 2.5 million. Just over 51 percent of the population was rural. The overall average population growth was estimated at 3.3 percent per year with the urban population growth the rural (4.8 percent per year). Recent forecasts indicate that by 1985 the urban population will exceed the rural population, reaching 52 percent of the national population. Population density is 19.2 per km<sup>2</sup>, or 51.1 per km<sup>2</sup> of arable land. GNP per capita in 1980 was US\$720. The adult literacy rate in 1980 was 87 percent, which represents a substantial increase over the early 1970's figure of 58 percent, due in part to a concentrated effort undertaken by the new government shortly after its takeover. Male and female literacy rates are roughly equal in Nicaragua.

The people in the Caribbean Region live chiefly by farming small plots or by fishing, lumbering or mining. Those in the Central Highlands generally own small farms. Many of the people in the Pacific Region work on large estates and live in or near the estates in palm thatched huts.

4. Nicaragua is still recovering from the effects of a revolutionary war which led to the overthrow of the Somoza government in July of 1979. More than 30,000 people died during the war, and many more left the country. The flight of capital prior to and during the conflict exceeded half a billion dollars. Direct damage to structures, equipment and inventories, particularly

in urban areas, exceeded a quarter of a billion dollars. Agricultural output also declined, particularly cotton, basic grains, and milk and egg production. Export proceeds declined by 47 percent in real term from 1978 to 1980.

5. The new government introduced a mixed economy, with a greatly expanded public sector. Government institutions were completely reorganized, and several new ministries were created. The agricultural sector saw sweeping changes. Nearly 1 million hectares of farmland belonging to the Somoza family or its associates were taken over by the State. Each farm was then organized as a State Production Unit (UPE). A group of about six contiguous UPE's comprise a "complex". The 160 complexes are grouped into 27 enterprises which are responsible to the general Directorate of Production in the Ministry of Agricultural Development. In addition, there are the Sandinista Agrarian Cooperatives managed by peasants. In mid-1980 the estimated number of such cooperatives was 450-650. Estimates are that about 70,000 people, or 20 percent of the active agricultural labor force, are involved in the new structures resulting from revolution. A similar proportion of the country's population is likely to be affected by the new institutions which can be expected to lead to major changes in the social structures of villages, and in the lives of village women.

6. Another factor likely to have an important impact on villagers' lives is the nationwide literacy campaign of 1980. Increasing numbers of peasants are now able to sign their own names to documents, and to read simple leaflets and brochures. Estimates are that the adult literacy rate is now about 87 percent. Literacy enables rural villagers to learn new ways of doing things, and to communicate with others outside their immediate area.

7. Living conditions and health services in rural areas are often inadequate. There is a severe housing shortage which results in overcrowding,

and aggravates the poor health conditions. In rural areas nearly all of the dwellings are simple structures with a few rooms generally built by the campesinos themselves and lacking comfort and sanitation. There is usually a sleeping room and a living room. In many cases, the kitchen is in the living room and in others, in a separate shelter near the house. The walls of the houses may be made of adobe, brick, poles and canes either plain or mud plastered. Sometimes boards are used. The roofs are of straw, galvanized corrugated metal, or tiles although they are declining in use. Most houses have a dirt floor which is swept frequently to keep it clean. Furniture is very limited and for sitting ranges from leather seated and leather backed chairs to log benches. For sleeping, poor people make their beds of sticks set in the ground with a row of poles set across them. A woven grass mat is placed on top of this. Folding cots of canvas or cotton are often used in the highlands and in the Pacific area.

8. In 1976 it was estimated that 11 percent of the rural population had latrines. Water supply is also poor with only 6 percent served by standpipes and only 14 percent of the rural population with reasonable access to water. Many of the inhabitants obtain their water from nearby rivers and shallow dug wells, several of which are contaminated and unsafe. There is no system for disposing of garbage which frequently is left lying around and attracts insects and rodents and poses a health hazard. Life expectancy for women was about 56 years, and for men about 53 years in 1975. The most frequent causes of death are gastro-intestinal diseases (usually from parasitic complications) infant diseases, cardio-vascular and infectious diseases. In the mid-1970's 74 percent of all reported cases of communicable diseases were related to contaminated water. Health facilities and sanitation services are inadequate in Nicaragua particularly in the rural areas. There is a shortage of trained

medical and paramedical personnel and most of the medical facilities and personnel are located in Managua, the capital. Health Statistics are very unreliable due to unreported deaths especially of infants; morbidity and mortality are reported where they are diagnosed (usually in urban areas) and seasonal labor migration for cotton and coffee crops distorts morbidity rates in the Pacific Regions.

## II. ECONOMIC AND SOCIAL ACTIVITIES OF WOMEN

9. Women account for somewhat more than 50 percent of Nicaragua's population. Their life expectancy is 56 years of age. Most women marry or live with a common law husband for at least part of their life. A 1977 study of rural women<sup>1/</sup> found that the average age of the mother at the birth of her first child was about 19.5. By age 34, 6 children had been born, although not all had survived. Maternal mortality is very high, 280 per 10,000 live births as compared to 19 per 10,000 in the U.S. Ten percent of those deaths are probably due to illegal abortions. Infant mortality is also high, at 123 per 1,000 births. In the early 1970's 13 percent of the children born died before the age of one. Enteritis and other diarrheal diseases related poor sanitation conditions account for 37 percent of the deaths of young children.

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<sup>1/</sup> Gillespie, Vivian H. "A Modified Time Budget Methodology for Gathering Base-line Data on the Roles and Responsibilities of Rural Women in Nicaragua," prepared for USAID Office of Women in Development, August 1977. The Study was carried out in six different villages in Area V, Nicaragua's Central Interior region.

10. The roles of the husband and wife have traditionally been strongly differentiated. The wife has almost complete responsibility for the internal operation of the household averaging about 6 persons, from the preparation of meals to the raising of the children. She has considerable autonomy in carrying out these tasks. In addition to taking care of the physical needs of the household she must provide her children with emotional security, supervision and discipline. This requires considerable time and energy. In rural areas, the wife often shares the agricultural work load in addition to her household chores. The father represents the family in social, economic and political life outside the household. He spends most of his time outside the home at work in the fields and at leisure with other men. Up to half of the rural households may be consensual unions rather than formal marriages.

11. Food preparation, cleaning and child care occupy most of the rural woman's time. She rises before dawn, takes the soaked and cooked corn to a small grinding mill nearby or grinds it herself on the "piedra de moler." She makes the tortillas and beans for breakfast, feeds and tends the farmyard animals, cleans the house and fetches water from a stream, well, or spring which may be quite far. Water weighs 8.3 pounds per gallon which could amount to 200 pounds per day for a household using 4 gallon per capita. Where water is not obtained easily it is reused and this creates a health risk. Every few days she washes clothes in the stream or at the village washing place. She makes lunch and she or her children carry it to her man in the field if he is working at a distance. She may stay in the fields to work and return home with him. Again she cares for the animals, prepares food for supper, prepares the corn for grinding and the beans for cooking. Sometimes she does weaving or handicrafts for the family's use or to increase family income. In addition, in Nicaraguan villages it is traditionally the woman's tasks to make repairs around the house.



12. Table 1 shows that a rural woman who does not engage in any profit making work spends 40 percent of her day in food preparation activities, 16 percent on child care and on socializing and 11 percent on carrying water. Women who were involved in handicraft work in their homes devoted close to 50 percent of their time to that activity, and only 20 percent to food preparation, 6 percent of childcare and again 11 percent to water carrying. It is customary for older children to assist their mothers in such tasks caring siblings and carrying water.

13. Studies indicate that between 20 and 40 percent of rural women are engaged in some kind of money-making activity, at least part time. For the country as a whole, around 75 percent of the economically active women are in the tertiary sector, services, business or finance, but only about 10 percent of them are professionals, mainly teachers and nurses. The most common sources of income for rural women are working on cotton, coffee or sugar cane harvests, selling milk, eggs, chickens or piglets, making and selling milk cheese or tortillas, washing clothes for pay, or making and selling pottery, vegetable fiber or textile handicrafts. The best paying activity was owning a small store which could gross about US\$280 per month at the time of the study. The lowest paying activity is selling eggs or milk, which generated only about US\$ 4 per month, Selling cheese or washing clothes provided an income of about \$17 per month. Piglets are kept as a form of rural saving account and sold only in case of emergency.<sup>1/</sup>

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<sup>1/</sup> The Gillespie study did not include the more active periods of the agricultural cycle and data on harvesting incomes were not provided. Nor was it clear what the average woman earned from her work.

14. The study of 6 villages found that 34 percent of the women decided themselves how the money they earned would be spent. Another 25 percent said that they shared the decision making responsibility with their husband. This implies that over 60 percent of the rural women interviewed either control or share the control over the money which they themselves earn from their work. There was no information on whether women also has some control over the income earned by their husband.

15. Rural women appear to spend approximately 11 percent or one hour of their typical work day carrying water for household use. In 1977, for a potter, this amounted to a loss of 85-90¢ per day or \$317 per year in potential income. In addition, many of women's other household tasks involve the use water, and are complicated by the absence of an on-site source of rural water. Table 2 shows the division of labor according to sex in rural areas. It can be seen that roughly half of the woman's duties require the use of water. Some of the man's duties may require water, for mixing concrete for example, but it would usually be brought to him by his wife. The time required for tasks such as child care and clothes washing is lengthened when no running water is available. Similarly, a child sick from contaminated water or poor sanitation requires a greater amount of care and time.

### III. THE PROJECT

16. The Government of Nicaragua, concerned about the country's inadequate health and sanitation conditions undertook to develop a program to improve them. The Ministry of Health (MOH) was assigned the task and with the assistance of the Pan American Health Organization prepared the Plan Nacional de Saneamiento Rural (PLANSAR) and in 1975 established an office in the Ministry, PLANSAR, to carry it out. The Government, seeking to expand the program, then requested Bank financing for this project. In 1978 the World Bank lent US\$3 million

to Nicaragua to expand its rural sanitation program. The loan covered foreign exchange costs and about 18 percent of local costs. Cost estimates are summarized in Table 3. The Bank project is for regions<sup>\*/</sup> I, II and VI, where most of the rural population is found (the Rift Valley and the Pacific Coast). In 1977 a similar project for regions II, IV, and V was started with AID financing.

17. The purpose of the project is to improve the basic sanitation services to rural areas by providing an integrated program of water supply, latrines, health education and immunization of children. About 172,000 people (1971 census) in about 550 villages would benefit from the project, and by 1988 it is estimated that about 250,000 people in the lowest income groups in Nicaragua would be served in these villages. One of the objectives of the project was to increase effective nutrition through reducing the incidence of intestinal parasites especially among children.

18. Important elements in the project are the community participation in organizing and developing the facilities and the assistance of health educators and technicians to teach better utilization and maintenance of the facilities. The health educators and technicians will train village leaders and one or two operators to provide continuing education to their neighbors, maintain the improved health conditions and to operate and maintain the water systems. Two levels of training are required; at the family level for the use and maintenance of the individual facilities and personal hygiene, and at the community level for use and maintenance of the community facilities.

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<sup>\*/</sup> Nicaragua's Plan Nacional de Reconstrucción y Desarrollo (1975-80) classified the country into 8 bio-physical regions (see map).

19. The project had been underway several months when the Civil War occurred. Progress was interrupted and the project was restructured. An amended project was agreed upon April 2, 1981. Work done before the Civil War has been classified as Phase I under the revised project; and that to be done, Phase II. The Government maintains the project under the Ministry of Health, in new department, Area Hygiene de Medio (AHM).

20. Under the project a Regional Unit was established for each region with offices in two or three conveniently located villages. Each office was to be the center of operations for villages within 50-100 kilometers. After completing a groups of subprojects the office was to be moved to another area. Regions VII and VIII which are difficult to reach with heavy jungle, and sparsely populated, were to be deferred.

21. A Health Educator Promoter was to visit each village to sensitize the community to its basic health problems and to organize (usually with the participation of the local school teacher) a Health Committee or cooperative. This would be formed with leaders of the community. The Educator and committee would evaluate the health problems, possible solutions and the communities willingness and ability to participate in the project. On the educator's recommendation, the Ministry of Health would then send an engineer to determine the least-cost solution and cost of the specific facilities to built.

22. A typical subproject was to include: water supply (handpumps), latrines drainage for mosquito control, immunization of children, and in-house improvements (waste disposal, roof, floor, and wall improvements and connections to where water distribution networks were available.) Simultaneously, health education on communicable diseases and basic sanitation were to be provided to the community by the educators, who were to be mainly women since women were assumed to be the principal guardians of their family's health

23. A written request was to be presented by the committee to PLANSAR describing the works to be done, its schedule, and community contribution (in works days, materials, cash). Cash contributions were to be collected by the committee treasurer, using receipts provided by PLANSAR. Upon approval by PLANSAR, an agreement was to be signed between the Government (PLANSAR) and the village committee or cooperative (on behalf of the community). This agreement would describe the works to be performed, respective contributions of the community and PLANSAR, the responsibilities of the community for operation and maintenance, and the role of the Ministry of Health (MOH) for supervision. (A minimum contribution from the community in labor and cash of about 15 percent of project costs were to be required.) Original project cost estimates are shown in Table 3.

#### Sector Institutions

24. The Ministry of Health is responsible for health and rural sanitation programs in Nicaragua. It provided urban health services through the General Directorate of Health, and rural health and sanitation services through the Rural Health Department. The Rural Health Department had three sections; Administration (procurement and general services); Human Resources (training for paramedical personnel) and PLANSAR (planning and executing rural sanitation programs). PLANSAR had two departments: Planning and Execution. The Planning Department organized and coordinated the execution, operation and maintenance, education and immunization programs among the different regions. The Execution Department through its Regional Units was responsible for community organization, health education and the construction of sanitary works. The MOH was cognizant of the role of women in rural areas and directed the efforts of their health unit personnel and health educators to health education meetings and personal hygiene discussions with the women.

25. The Rural Health Department had a total of 85 employees, most of them technicians participating in the design and execution of works. The staff was young and highly dedicated and motivated. The water systems for the rural communities were simple and repetitive. There was one Regional Unit responsible for the AID project. Under the Bank project two additional Units would be required with about 44 employees each.

Criteria for Financing Subprojects

26. The following criteria were developed for identifying eligible communities:

- (a) rural with a population of 50-800;
- (b) able to mobilize community participation, either in labor or cash or at least 15 percent of the works costs;
- (c) per capita costs of the investment in water supply of less than US\$25 (1977 dollars).

27. The design criteria were as follows:

- (i) project to serve 90 percent of future population in next 10 years;
- (ii) water supply of 5 gallons per capita per day from public standpipes for dispersed populations, 10 gallons per capita per day for small systems and wells within easy access and 12 gallons per capita per day if livestock are served by same sources;
- (iii) for wells, maximum walking distance in flat terrain to be about 500 meters (average 300 meters); and
- (iv) reliance on three types of small systems:

Type A - gravity transmission from source;

Type B - gravity transmission from source plus storage for half-day demand; and

Type C - used only for populations of 500 or more or where mechanical pumping is required. These include transmission, storage for half day demand and some distribution lines, initial connections to be to the school or community buildings with house connections to be made later by the community, maximum use of local materials and community labor.

Number of Villages to be Served by the Rural Sanitation Project

	<u>-----1978-----</u>		<u>-----1979-----</u>		<u>-----1980-----</u>		<u>-----1981-----</u>		<u>Total</u>
	<u>1 Sem</u>	<u>2 Sem</u>	<u>1 Sem</u>	<u>2 Sem</u>	<u>1 Sem</u>	<u>2 Sem</u>	<u>1 Sem</u>	<u>2 Sem</u>	
Region VI	60	40	74	50					224
Region III			15	10	34	30			89
Region I					52	36	90	70	248
<b>Total</b>	60	40	89	60	86	66	90	70	561
<b>Total per year</b>	100		149		152		160		

28. The villages were classified according to their population, type of water sources, technical feasibility, and expected community participation. In the first stage of the program only villages which were accessible by road (at least part of the year) were included in the program. The project proposed to install wells at a maximum walking distance of 500 meters, with the average being 300 meters. The project documents do not indicate the average pre-project walking distance to the water source. Presumably, the

distance was greater, and the projected 300 meter distance is based on an evaluation of a combination of economic, technical and social factors, including the women's assessment of a reasonable distance to travel for water.

### The First Results

29. PLANSAR had been established in 1976 and had carried out 60 village schemes during the first half of 1977. It had received advice from PAHO and financing from USAID. These village schemes were successful in obtaining community participation and determining design standards and selection criteria. Under the USAID project, educators were being trained to teach villagers the advantages of clean water and sanitation, and to help organize communities. The project has been progressing well and would ultimately serve 300 villages.

30. Communities' responses have been enthusiastic; contributions of cash or labor have often exceeded the required minimum 15 percent of project costs and the execution rate has been faster than planned. The MOH expected that the cooperatives or associations formed by the project would be used for other programs - nutrition, family planning, and education - all part of integrated rural development.

### Project Changes

31. Following the civil war in 1979 and the installation of a new government, PLANSAR was dissolved. Its responsibilities and staff were transferred to the Area Higiene del Medio (AHM) a department of the reorganized Ministry of Health and the Instituto Nicaraguense de Acueductos y Alcantarillado (INAA). AHM was established as the executing agency, responsible for all aspects of the project, except water supply. INAA was to assist AHM and to be responsible for the rural water supply.



32. The Government was anxious to continue the project and on June 30, 1980 presented a plan for doing so. The Bank sent a mission to the field to review the status and arrangements. The mission recommended approval of the government's proposals and on April 2, 1981, the amendment to the loan was approved.

33. Mainly because of the civil unrest and changes in government, project achievements up to June 30, 1980, (Phase I) were far below those scheduled. A total of 1,732 latrines were installed rather than the target of 5,150 new ones and 12,000 improved or rehabilitated ones. The well improvement and construction program was barely started. Only 12 wells and 5 sanitary units (a well complemented by 2 laundry basins and 2 bathing stalls) were built compared to a target of 367 new or improved wells and 32 small water systems (mini-aqueducts). The main reasons for this failure were PLANSAR's inability to procure materials and construct wells as planned and the change in institutional responsibilities. The immunization program was not started until after the war. Since then, the new government has carried out a nationwide immunization program for children. According to AHM the project area was included, and this component is considered to have been completed. The house improvement program has not been started and is now deleted. With loan funds PLANSAR had purchased 15 vehicles, a well drilling machine, and miscellaneous equipment. Two of the vehicles were destroyed in the fighting, and the majority of health education equipment and tools lost. AHM now has possession of the remaining 13 vehicles, well drilling machine and most of the office equipment.

34. By the end of Phase I (June 30, 1980) the Bank disbursed about US\$0.7 million of the US\$3.0 million loan. Government contributions covered about 42 percent of total expenditures and community participation about 5 percent. The apparent low community participation is due to the initial purchases for equipment and start-up costs for the project.

The Revised Project - Phase II

35. The modified project has the same objectives but significant changes from the original. AHM will construct 9,910 latrines under Phase II, raising the total to 11,640 and surpassing the original target of 7,500 new latrines. It does not include the improvement and rehabilitation of about 18,600 latrines as initially planned. The house improvement, being financed by the Government of Nicaragua was also not included. Table 4 shows revised project costs.

36. AHM also proposed 120 sanitary units which were not in the original project. These consist of a dug or drilled well with a handpump, laundry basins and washing facilities. Some have been built under Phase I and are enthusiastically accepted by the villagers. Most of the wells will be constructed with these sanitary units. The villagers, through their committees, are responsible for the maintenance of these units.

37. There are also institutional changes and the transfer of responsibilities to AHM and INAA, which may speed up the water supply construction activities. The project amendment also establishes a revolving fund of US\$250,000 for the purchase of local materials which should help expedite the project execution.

38. Additional vehicles and equipment will be needed to replace war losses and carry out Phase II. INAA would receive vehicles, tools, equipment to drill well and construct the small water systems. The technical assistance program has been modified and only short-term consultants will be hired for specific advisory services at a total of US\$50,000.

39. Health Education is considered to be basic to the project and continues to receive a high priority. AHM has 20 health educators/promoters one of whom is a female, working in the two regions where project work is currently under way. Half their salaries are paid from the loan. The Health Educators/Promoters work out of the regional offices. The educators/promoters are

organizing the communities, making needs surveys, directing local effort and giving instruction and demonstrations on health and sanitation. Project experience shows that frequently the women of the villages push their husbands to help form committees and participate in the project. The women also help decide on the type of service to be provided.

40. Progress has been more rapid in the latrine program and the local contribution has been greatest. The concrete slabs and risers are care in Managua and delivered to the villages. The beneficiaries provide the bricks and do the excavation under the guidance of the health educator/promoters. The latrines are well built although the owners are not providing the seat lids which AHM does not do. Lids are needed for insect control, and AHM may have the Health Educators/Promoters motivate the owners to make use of them.

41. By October 1981 only 18 wells had been built, and of these, 15 were for sanitary units and three for simple source supplies. The present construction program is in villages where mini-aqueducts will be built. Region II, where work has not yet started is where more wells will be built.

42. INAA plans to build 12 mini-aqueducts in 1981. By October 1981 two were finished and 3 were under construction. These systems (Type C) consist of a drilled well, electric motor driven pump, storage tank, and yard connections to the houses. They serve more than 500 people and are built where electricity is available. Where wells with electric motor driven pumps are not feasible, community wells with handpumps are built. Surface water sources requiring treatment and systems requiring diesel engine and maintain. The village committees are responsible for operation and maintenance and are doing it well in those systems already built.

43. Community participation continues through village committees. These are now called Comite de Defensa Sandinista and were established in each village by the government after the war. These committees have broad functions including community organization education, and health. Under the project AHM will sign standard agreements with these committees who are then responsible for community participation, and operation and maintenance of the facilities to be built.

Table 1  
Rural Women's Time Budget  
For Work at Home<sup>1/</sup>

Nicaragua

Most Frequently Performed Activities	Housework Only <sup>2/</sup>	Housework plus at home potter work <sup>(3)</sup>
Food Preparation	2 hrs. 42 min.	1hr 57 min.
Food Processing	1 hr 21 min.	-----
Child care	1 hr 38 min.	37 min.
Carrying Water	1 hr 4 min.	1hr 5 min.
Cleaning House	34 min.	1hr 1 min.
Washing Dishes	15 min.	15 min.
Socializing	1 hr 34 min.	1hr 1 min.
Eating	18 min.	17 min.
Resting	31 min.	-----
Working with Clay		4hrs22 min.
<b>Total</b>	<b>9hrs 57 min.</b>	<b>9hrs34 min.</b>

1/ Gillespie, op. cit., Figure 16, Sample size was small and data are presented only to give a general idea of the time women spend on various household tasks.

2/ Averages for 4 villages

3/ Averages for one village.

Table 2 <sup>1/</sup>

Division of Labor by Sex  
Rural Nicaragua

Women	Men	Both
Check quality of tobacco	Plow	clean field
Milk cows	Plant	Harvest
Feed animals	Slaughter Animals	Stake tomatoes
Carry water	Herd Cattle	Weed
Make and repair walls	Chop and carry wood	Sell crop
Make and repair floors	Build house frame	Work in Kitchen
Make and repair oven	Build roof	
Make and repair stove	Build latrines	
Make kitchen tools	Build wells	
Make pottery	Make furniture	
Make rugs		
Make baskets		
Make horse decorations		
Weave fiber for hats		
Process food		
Prepare food		
Serve food		
Buy food		
Sell chickens, milk, eggs, etc.		
Prepare and sell food		
Sell in small store		
Water plant		
Make fire in morning		
Mend & sew clothes		
Wash clothes		
Iron clothes		
Wash dishes		
Clean house		
Care for children		
Shell corn		

1/ Source: Gillespie, op cit, figure 19.

Table 3

	-----CS MILLION-----			-----USS MILLION-----		
	LOCAL	FOREIGN	TOTAL	LOCAL	FOREIGN	TOTAL
DRILLED WELLS	0.84	2.45	3.29	0.12	0.35	0.47
DUG WELLS	1.16	0.63	1.79	0.17	0.09	0.26
IMPROVED WELLS	0.89	0.58	1.47	0.13	0.08	0.21
A AQUEDUCTS	0.20	0.31	0.51	0.03	0.04	0.07
B AQUEDUCTS	0.20	0.22	0.43	0.03	0.03	0.06
C AQUEDUCTS	0.90	1.70	2.61	0.13	0.24	0.37
IMPROVED LATRINES	0.18	0.01	0.20	0.03	0.00	0.03
REHABILIT. LATRINES	0.55	0.35	0.90	0.08	0.05	0.13
ADDITIONAL LATRINES	3.15	0.90	4.04	0.45	0.13	0.58
HOUSE IMPROVEMENTS	3.67	0.21	3.88	0.53	0.03	0.56
IMMUNIZATION	0.00	0.35	0.35	0.00	0.05	0.05
EQUIPMENT	0.07	1.81	1.88	0.01	0.26	0.27
TECHNICAL ASSISTANCE	0.42	0.98	1.40	0.06	0.14	0.20
HEALTH EDUCATION	2.00	0.00	2.00	0.29	0.00	0.29
ENGINEER. ADMINISTRAT.	4.87	1.00	5.88	0.70	0.14	0.84
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BASIC COST	19.11	11.51	30.62	2.73	1.64	4.37
TECHNICAL CONTING.	1.84	1.59	3.43	0.26	0.23	0.49
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TOTAL CONSTANT PRICE	20.95	13.10	34.05	2.99	1.87	4.86
PRICE CONTINGENCIES	7.45	2.89	10.34	1.06	0.41	1.48
-----						
TOTAL INVESTMENT	28.40	15.99	44.39	4.06	2.28	6.34

Note:

C\$1.00 = US\$0.14

US\$1.00 = C\$7.00

Table 4

REVISED PROJECT COST ESTIMATE

<u>PHASE II</u>				
(in thousands of Cordobas) 1 Cordoba = US\$0.10 June 1980				
	Foreign	Local	Total	%
Latrines	7.7	5.1	12.8	24.8
Wells and Mini-Aqueducts	6.3	6.2	12.5	24.3
Sanitary Units	0.5	0.3	0.8	1.5
<b>Subtotal a)</b>	<b>14.5</b>	<b>11.6</b>	<b>26.1</b>	<b>50.6</b>
Equipment AHM	0.9	-	0.9	1.8
Equipment INAA	0.7	-	0.7	1.3
Technical Assistance	0.5	-	0.5	1.0
Health Education	-	2.0	2.0	3.0
Eng/Admin. AHM	-	6.7	6.7	12.9
Eng/Admin INAA	-	1.7	1.7	3.3
O & M Equipment AHM	2.9	0.3	3.2	6.3
O & M Equipment INAA	0.5	0.1	0.6	1.1
<b>Basic Cost</b>	<b>20.1</b>	<b>22.4</b>	<b>42.5</b>	<b>82.2</b>
Price Contingencies b)	0.5	1.1	1.6	3.2
<b>Total Constant Price</b>	<b>20.6</b>	<b>23.5</b>	<b>44.1</b>	<b>85.4</b>
Price Contingencies c)	2.5	5.1	7.6	14.6
<b>Total Cost</b>	<b>23.1</b>	<b>28.6</b>	<b>51.7</b>	<b>100.0</b>

a) Includes technical contingencies.

b) Technical contingencies 10%

Foreign: 10.5%, 9%, 8% for 1980 to 1982

c) Price contingencies Local: 20%, 15%, 10% for 1980 to 1982