

## WOMEN AND WATER SUPPLY DEVELOPMENT IN SIERRA LEONE

OSMAN BAH\*

### ABSTRACT

Provision of improved wells is part of the Integrated Agricultural Development Programme (IADP) in Sierra Leone. This study surveys the wells development scheme of two Integrated Agricultural Development Programmes (IADPs). The schemes are meant to address women and their needs in rural areas. It is believed that women have to spend too much time gathering water, therefore, they are unable to be involved in economic activities—farming and trading. The schemes are meant to release labour from water collection to be used in economic activities.

The time budgets of women in two villages with improved wells (Gborwobu and Kambia) and two villages without improved wells (Saina and Rolilia) are not significantly different. Improved wells in the first two villages have not saved women's time collecting water. Improved wells are not specifically designed to benefit women directly, but it is implicit in the rhetoric of funding applications that improved water sources will strengthen and benefit women in the domestic economy.

### I. Introduction

It is a common place of the literature on "women and development" (cf. Cleave, 1974; Rogers, 1984; Boserup, 1970; Wiener, 1972) that women have been by-passed by development schemes. It is thought "natural" that a woman's place is the home and that she has a specific set of tasks which are thought to be universal, because they are based on the biological imperatives of sex. The United Nations Commission on the status of women refers regularly to "raising the status of women" as a major objective (United Nations, 1978, p. 153). More recently, third world women themselves have re-echoed the "women in development" approach as a potent strategy for total development (Sen, 1985) but must be planned by each society

\* Lecturer, Department of Studies and Geography, Njala University College, Univ. of Sierra Leone

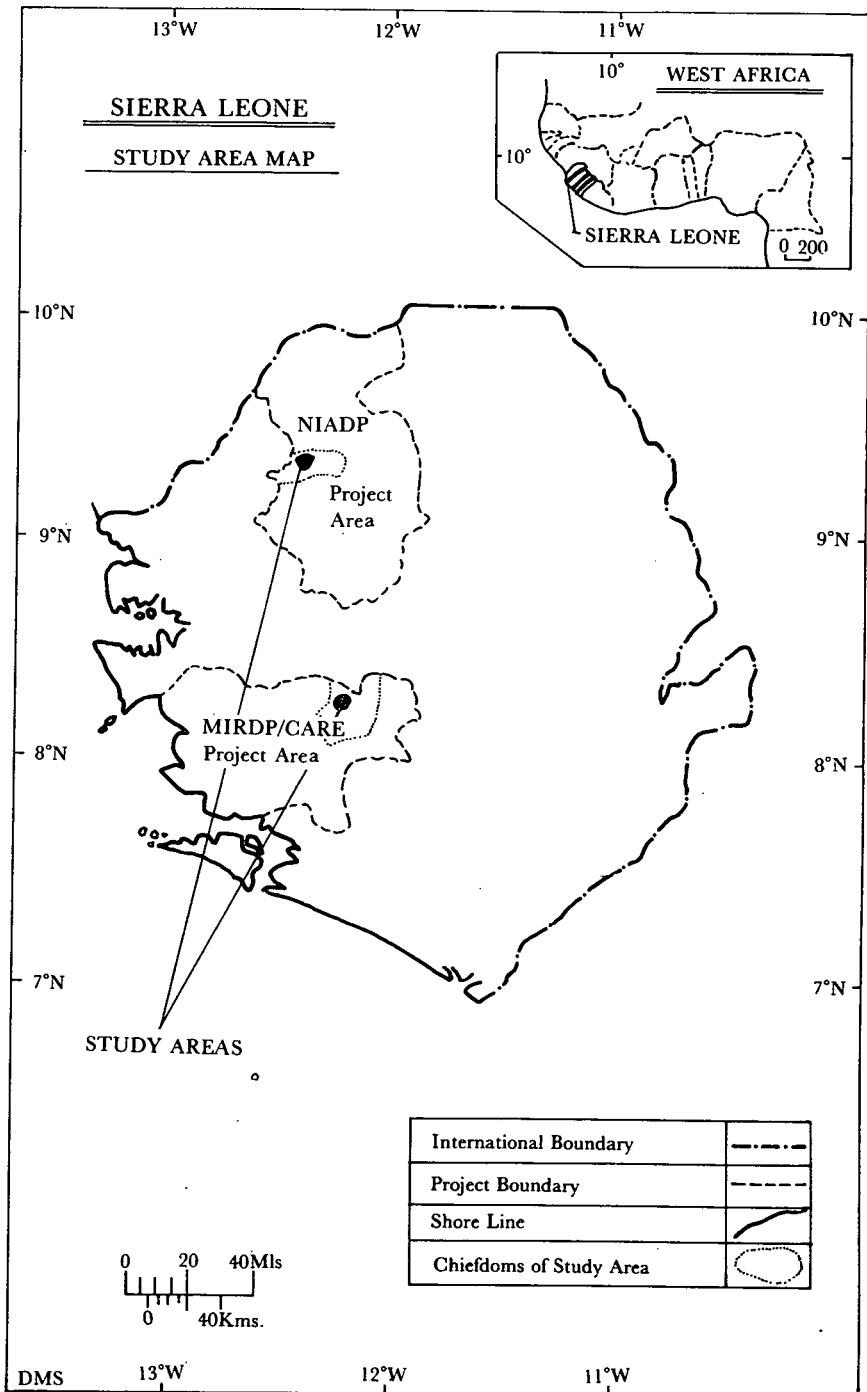
according to their values as aspiration (Mead, 1975). For example, they argue that the "women in development" approach is still very much western oriented (Sen, 1985). The majority of the development agencies are starting special projects for women throughout the developing world. In Sierra Leone, such schemes can be seen in the provision of improved well water supplies in the context of Integrated Agricultural Development Projects (IADPs), seven of which already exist. These projects also supply improved seeds, fertilizers, pesticides, marketing facilities, feeder roads and credits.

IADPs share the belief that improved well water supplies provision will release labour from water collection for productive use in agriculture and fostering of trade for example, since water collection in developing countries has been considered the single most time-consuming domestic chore of women (Bradley, *et. al.*, 1972; Cleave, 1975, p.163; NIADP, 1976; MIRDP, 1982; Taylor, 1975). Hence, the provision of improved well is a way of addressing women's needs.

The aim of this paper is to measure the efficiency of the improved well water supply provision schemes in Sierra Leone and their effect on women's lives. The paper attempts to discuss three central issues with regards women and improved well water provision. First, the paper examines rural women's domestic chores *vis-a-vis* water use patterns. Second, it investigates women's role in agriculture and how far water supply development has influenced this role. Here, an account of male and female farming activities over the farming calendar is given. Thirdly, the paper considers the likely benefits of a water supply improvement development to trade promotion. A consideration of all these factors is necessary in order to evaluate the efficiency of a well water supply development programme in line with the "women in development" approach, as it affects women in rural Sierra Leone.

## II. Context of the Study

As the IADPs concentrate on the digging of improved well water supplies in rural Sierra Leone, it is doubtful whether in the allocation of wells regional climatological differentials have been taken into account. The Southern Province of the country is less constrained by water than the Northern Province because of its longer rainy season 7–9 months, as opposed to 5–6 months in the North (Gwynne Jones, *et. al.*, 1978). In this paper, this geographical difference in terms of water problems is approached by undertaking a North/South contrast of the effectiveness on women's lives of the water supply provision (Fig. 1). Two schemes are examined; the established Northern Integrated Agricultural Development Project (NIADP) and a relatively new scheme (Moyamba Integrated Rural Development Project/Cooperative for American Relief Everywhere: MIRDP/CARE). It is anticipated that lessons from the early established project will be used in



rationalising the wells programme of the recently formed project.

Four case study villages were chosen to represent areas with outright severity of the dry season. The analysis draw on data from Gboworbu and Kambia (villages with improved wells) and Saina and Rolilia (villages without improved wells). It is essential to see not only how women in villages with improved wells have been affected by the scheme, but also to be able to see how their water use activities differ from patterns in villages without the scheme. The main measurement relates to women's time budgets. The questionnaire was filled in on the basis of direct personal observation of women's daily household activities and recording time spent on every activity, thus allowing a thorough test of whether improved wells do or do not significantly improve opportunities for women. Although, this exercise is time consuming and tedious, it is nonetheless highly reliable. This is in contrast to a number of other studies, for example, Warner, 1974, where women's time budgets were made by surveys, in which statements were taking down from respondents. One might question the reliability of data collected this way without further checking.

Because of the occurrence of polygamy on an extensive scale in the villages under examination, analysis was confined to labour of the first two adult wives in selected households. In polygamous households, wives are precisely ranked, the head wife or senior wife, being the first wife married. The inability in the end to generate fully comparable data sets for villages with and without water supplies was disappointing. The practical problems of mobility largely due to fuel shortages throughout the country and the limited time available for the study, restricted the number of women monitored in the villages without improved wells. The period of investigation covers February, March and April 1987. The aim is to examine what impact the period of severe water shortage had in the allocation and organization of women's labour.

### III . Women and Their Activities : Domestic Tasks

The time budget of women in domestic tasks (Table 1 and 2) show large amounts of time spent on domestic tasks for all but senior wives in Kambia. Senior wives in Kambia were found holding regular meetings during the survey period concerning arrangements for the forthcoming "Sande" society (the women's secret society). This has not met in the village for 6 years, and their small contribution to domestic tasks during this period reflects this fact. Food preparation accounts for 30 percent of women's time devoted to domestic tasks. Clearly, it takes up more of women's time (2-3 hours per day) than time carrying water (less than 1 hour per day) in all of the four study communities. Women are not the sole water carriers in rural Sierra Leone, since young boys and girls are also involved. In rural Sierra Leone,

young boys and girls carry 60 percent of water for domestic consumption (Bah, 1986, 1987). Preparation of meals in these villages involves the collection of vegetables from the backyard garden, removing husk from the rice grain, processing and cooking (itself requiring collection of fuelwood and sometimes occasional tasks such as parboiling of rice). In these villages,

**TABLE 1. Time Budgets of Women in Gbowedbu and Kambia in Domestic Tasks (Villages with Improved Wells).**

Percentages of time spent over a 14 hour day

	February 1987		March 1987		April 1987	
	Senior Adult Women	Junior Adult Women	Senior Adult Women	Junior Adult Women	Senior Adult Women	Junior Adult Women
	Sample 20	Sample 17	Sample 20	Sample 17	Sample 20	Sample 17
<b>Gbowedbu</b>						
Domestic Tasks						
Sweeping	2.4	1.4	1.8	2.1	1.3	2.0
Collection Water	5.7	8.9	5.9	6.9	5.5	5.7
Collection Wood & Leaves	2.1	5.6	2.5	2.5	2.0	4.6
Food Processing & Cooking	25.3	27.9	23.1	27.8	27.5	6.9
Washing Clothes & Cleaning	4.7	1.4	3.1	2.2	3.5	1.7
Child Care*	2.7	0.5	2.8	0.8	2.2	0.5
Percentage Total of Domestic Tasks	42.9	45.7	39.2	45.0	42.0	21.4
Total Average Hours on Domestic Tasks	6.0	6.4	5.5	6.3	5.9	3.0
<b>Kambia</b>	Sample 20	Sample 20	Sample 20	Sample 20	Sample 20	Sample 20
Domestic Tasks						
Sweeping	1.3	2.2	1.5	2.2	1.3	2.8
Collecting Water	3.2	6.0	4.0	5.6	3.8	5.7
Collecting Wood & Leaves	3.4	5.7	1.7	4.1	1.3	5.5
Food Processing & Cooking	7.7	29.5	9.3	28.9	8.7	29.8
Washing Clothes & Cleaning	1.6	2.8	1.7	1.9	3.3	3.2
Child Care*	2.1	0.8	4.7	0.2	2.3	0.8
Percentage Total of Domestic Tasks	19.3	47.0	22.9	42.9	20.7	47.8
Total Average Hours on Domestic Tasks	2.7	6.6	3.2	6.0	2.9	6.7

Note: (1) Figures in the body of the table are percentages of time spent on activities over 3 periods as percentages of a 14 hour day.

(2) \*Child care can also be combined with other activities.

(3) Percentages do not add up to 100, as only the percentage time spent on domestic tasks is shown here.

Source: Field Survey, 1987.

**TABLE 2. Time Budgets of Women on Sania and Rolilia in Domestic Tasks (Villages without Improved Well).**

Percentages of time spent over a 14 hour day

	February 1987		March 1987		April 1987	
	Senior Adult Women	Junior Adult Women	Senior Adult Women	Junior Adult Women	Senior Adult Women	Junior Adult Women
Saina	Sample 10	Sample 14	Sample 10	Sample 14	Sample 5	Sample 10
<b>Domestic Tasks</b>						
Sweeping	3.5	2.4	2.5	2.5	2.4	2.9
Collection Water	6.2	10.3	5.9	8.9	4.8	5.9
Collection Wood & Leaves	2.3	4.8	3.3	6.1	2.0	4.5
Food Processing & Cooking	29.4	32.4	26.2	29.3	27.6	10.2
Washing Clothes & Cleaning	4.9	3.5	5.1	2.4	4.2	2.4
Child Care*	3.2	2.1	2.9	0.5	1.8	0.5
Percentage Total of Domestic Tasks	49.5	55.5	45.7	49.7	42.8	26.4
Total Average Hours on Domestic Tasks	6.9	7.8	6.4	7.0	6.0	4.0
Rolilia	Sample 10	Sample 10	Sample 10	Sample 10	Sample 5	Sample 5
<b>Domestic Tasks</b>						
Sweeping	2.9	2.4	2.4	2.1	1.4	2.4
Collecting Water	5.1	6.3	4.1	6.9	5.4	5.8
Collecting Wood & Leaves	4.3	5.6	3.8	5.4	6.2	2.4
Food Processing & Cooking	15.3	28.9	18.4	28.4	20.1	26.0
Washing Clothes & Cleaning	2.8	1.4	3.0	2.4	2.6	4.7
Child Care*	2.1	0.2	2.0	0.8	1.8	2.8
Percentage Total of Domestic Tasks	32.5	44.8	33.7	46.0	37.5	44.1
Total Average Hours on Domestic Tasks	4.5	6.3	4.7	6.4	5.2	6.2

Note: (1) Figures in the body of the table are percentages of time spent on activities over 3 periods as percentages of a 14 hour day.

(2) \*Child care can also be combined with other activities.

(3) Percentages do not add up to 100, as only the percentage time spent on domestic tasks is shown here.

Source : Field Survey, 1987.

cooking was carried out on average twice daily. Farm workers had to be provided with a mid-day meal, and then an evening meal was prepared for all members of the household.

Water collection is second to food processing and preparation, accounting for less than one third of the average time spent on domestic tasks in the

TABLE 3. Distance and Time Expended on Water Collection in Metres(Return Trip)

Village	Improved Well Weter		Traditional Sources		Average Number of Daily Trips made to collect water from all water sources
	Distance (metres)	Average Time Spent	Distance (metres)	Average Time Spent	
Gboworbu	93	2 hrs	914	1 hr	4
Kambia	160	1½hrs	468	30mins	4
Saina*	—	—	564	1 hr	4
Rolilia*	—	—	810	1 hr	4

Note: \*Villages without improved wells water supply.

Source : Field Survey, 1984.

study communities. Data on distance and time expended on water collection in the areas under study is presented in Table 3. The data for improved wells show a longer average length of time (1 hour 45 minutes) spent on water collection from improved wells than from traditional water sources (average water collection time of 53 minutes in all four villages). The inadequate amount of water from the improved wells means long queues of water carriers at improved well sites. This delay persuades many villagers to opt for traditional water sources. The average number of daily trips made by villagers to improved and traditional water sources are the same. In affect, the existence of improved wells in Gboworbu and Kambia does not reduce the number of daily trips made by water carriers. The negative significance of the longer time spent queueing at the improved wells becomes fully apparent when the fact that improved wells do not lead to a reduction in trip frequency is taken into account. It seems that the limited impact of improved well is shown by the long water collection queues in Gboworbu and Kambia. Therefore, a line of argument could well be to sink more improved wells. But can Sierra Leone afford this? The cost of an improved well at 1984 prices was Circa Le8,400. With the present economic recession following the devaluation, construction of improved wells is not an ideal strategy. However, since it has been pointed out that traditional water sources do exist and are used, the sinking of more improved wells might not be a useful strategy.

Cleaning and laundry duties demand relatively little of women's time (less than 30 minutes per day). The modestly furnished dwellings require little cleaning apart from some daily sweeping. This is a responsibility shared between women and young girls (as part of their training). Child care remains to a large extent the responsibility of the senior wives. The reason for this is that senior wives are considered more knowledgeable on matters relating to child care.

Summing up the data so far, it has been shown that collecting water does not take an inordinate amount of time, even in the dry season (less than one hour of an average working day in all four villages). Besides, young boys and girls are fully involved in water carrying duties for household use. Of all

the domestic tasks examined, food processing and preparation is the single most time-consuming domestic chore. The reason is two fold. First, it is labour intensive and second, it is carried out entirely by women. Water carrying is only one small facet of the cooking process and represents perhaps the least time-consuming element in the process. Drought in Sierra Leone is rarely a problem and even though the rivers and tributaries dry out during the dry season, villagers have a well-adapted way of meeting dry season water needs from hand-dug shallow swamp pits.

#### **IV. Women and Their Activities : Agricultural Tasks**

Studies by Richards (1985), Tommy (1980), Spencer (1976) found that women played an important role in farming in Sierra Leone, particularly in planting, ploughing, weeding and harvesting on rice farms. Since water supply is a duty often devolving on women, one of the areas where water supply provision might have an economically beneficial impact is on the time available to women for agricultural activities.

Table 4 presents data on women's time devoted to agriculture in the study villages. The key point to emerge is that during the months of February and March (the period of maximum water shortage) women did not spend time on rice farming. Work on the rice farms in February and March covers brushing, felling and burning, traditionally male activities. Because of this traditional gender specialization on farming (Table 5), water collection does not clash with farm work at this period. There is a potential class in April, but most areas begin to experience the first few storms of the rains. Women's time on agricultural work in Kambia and Rolilia were spent on tobacco nurseries. Junior wives carry the greater burden in farming for all four villages. This reflects the fact that senior wives are dominant over junior wives. A husband will be encouraged at times to marry again in order to spread the burden of demanding, labour intensive, tasks such as clearing on to a younger pair of shoulders. There is no doubt that jobs such as clearing are demanding of women's time. The key question is : Is there any evidence that competition between farm labour and water collection creates an insoluble clash of interests? In other words, would improve water sources liberate more time for clearing? Are farm sizes restricted by the availability of women to work on the farm and collect water at the same time? It is difficult to say from the evidence available, since (as already shown) improved wells do not necessarily save time.

Until improved wells save time, it will be impossible to see their impact on women's participation on rice farms. But given the traditional division of work responsibilities early in the farming year, it might seem reasonable to predict that the time-saving aspect of improved wells would only be marginal. Where effective wells might come into their own is if the pattern of



upland rice farming begins to change and women start to assume responsibilities for brushing and felling for instance.

**TABLE 4. Women's Time Devoted to Agriculture**

Figures in the body of the table are percentages of a 14 hour day

	February 1987		March 1987		April 1987	
	Senior Adult women	Junior Adult women	Senior Adult women	Junior Adult women	Senior Adult women	Junior Adult women
<b>Gbowedu</b>	(20)	(17)	(20)	(17)	(20)	(17)
Rice Farming	—	—	—	—	1.0	28.6
Ginger Farming	—	—	—	—	—	—
Tobacco Farming	—	—	—	—	—	—
Percentage Total of Agricultural tasks	—	—	—	—	1.0	28.6
Average Hours Spent on Agricultural Tasks	—	—	—	—	0.14	4.0
<b>Kambia</b>	(20)	(20)	(20)	(20)	(20)	(20)
Rice Farming	—	—	—	—	—	30.7
Ginger Farming	—	—	—	—	—	—
Tobacco Farming	25.7	5	36.8	11.4	12.8	—
Percentage Total of Agricultural Tasks	25.7	5	36.8	11.4	12.8	30.7
Average Hours Spent on Agricultural Tasks	3.6	0.7	5.4	1.6	1.8	4.3
<b>Saina</b>	(10)	(14)	(10)	(14)	(5)	(10)
Rice Farming	—	—	—	—	10	30
Ginger Farming	—	—	—	—	—	—
Tobacco Farming	—	—	—	—	—	—
Percentage Total of Agricultural Tasks	—	—	—	—	10	30
Average Hours Spent on Agricultural Tasks	—	—	—	—	1.4	4.2
<b>Rolilia</b>	(10)	(10)	(10)	(10)	(5)	(5)
Rice Farming	—	—	—	—	—	25.0
Ginger Farming	—	—	—	—	—	—
Tobacco Farming	20	10	19	8	10	—
Percentage Total of Agricultural Tasks	20	10	19	8	10	25.0
Average Hours Spent on Agricultural Tasks	2.8	1.4	2.7	1.1	1.4	3.6

Note: The number in brackets represents the number of women interviewed.

Source: Field Survey, 1987.

TABLE 5. Sex Roles, Rice Farming Tasks and Water Situation

Tasks	Time of Year	Predominant Role	Water Situation
1 Brushing	Jan—Feb	Adult Males	Start of Water Shortage
2 Felling	Feb—March	Adult Meles	"Harmattan" Water Shortage
3 Burning	March	Adult Males	Peak Dry Period
4 Clearing	April	Both Sexes	Water Shortage (Occasional rain in some areas)
5 Ploughing	April	Both Sexes	Occasional Rain in Places
6 Weeding	June—July	Adult Females	Sudden Rain Storms
7 Fencing	June—July	Adult Males	Rain Storms
8 Bird Scaring	Sept—Oct	Young Males	Rain Available
9 Harvesting	Nov—Dec	Both Sexes	Early Dry Season. Water in Streams.

Note: 1, 2, 3, 4 represents period of fieldwork.

## V. Water Supply Improvement and Other Associated Benefits

Women are expected to contribute towards the basic upkeep of the family as well as providing their clothing and luxury items. Women also have separate responsibilities to their own kin groups and must contribute towards the expenses of ceremonies associated with births, deaths and marriages. In order to fulfil these duties, a woman needs to earn money and one of the easiest ways for an uneducated woman in Sierra Leone to earn money is to trade (Tommy, 1980). It is therefore important to ask; what impact does water supply provision have on opportunities for trade? The argument is that if a water supply scheme is introduced in the community, then the extra time save in water collection might be devoted to trading activities.

Women's time devoted to trading is minimal. It is not surprising that given the point made about long delays in collecting water from improved sources, there is no apparent difference in the amount of women's time devoted to trading in villages with and without improved wells (an average trading time of 18 minutes per day) and villages without improved wells (an average trading time of 15 minutes per day). But in any case, there is little if any conflict between the time when women are collecting water and trading, since women's trading in these areas is based mainly on petty sales (mostly cooking condiments such as salt, pepper, etc.) from house verandah. Any household member can carry out the task and sales do not require the "Shopkeeper" to be present in person. Other

commercial activities heavily dependent on water (e. g. *gari-making*<sup>1</sup> and *gara dyeing*<sup>2</sup> of clothes) were non-existent in the villages, so it must remain an open question whether these future developments might be fostered by successful water supply developments. As yet, therefore, there is little if any evidence on which to base any firm prediction about the economic impact of improved wells on women's non-domestic, non-agricultural activities.

## VI. Summary and Conclusion

The literature points out that women have been by-passed in development, and that women's needs must be addressed. IADPs water supply agencies put forward the case that since water collection is the most time-consuming domestic chore for women in Sierra Leone, improved well water supplies must be provided to villagers. Because women have to spend too much time gathering water, they are unable to be involved in economic activities such as agriculture and trade. The point about the IADPs rural water supply scheme is to give women more time for agricultural and other income earning activities such as trading.

The evidence from the present study, suggests that in rural Sierra Leone, the burden of water collection is not especially an enormous one, and that it would be unwise to anticipate any dramatic economic impact on women's lives without paying attention to other and perhaps more pressing matters. On the other hand, even if more improved wells could be sunk or present ones are made more efficient in terms of water supply to stop the long queues at improved well sites, would there be a remarkable change in water use? The fact that dry season water problems are only acute for only 8 weeks or so during the dry season might in fact suggest that construction or improvement of expensive improved wells might not be a realistic approach, since villagers used their traditional water sources.

It is clear that women spend about one-half of their time on domestic activities. The considerable amount of time devoted to food processing and preparation (an average time of 3 hours per day) needs to be stressed, but the amount of time actually devoted to carrying water is relatively small (an

<sup>1</sup> *Gari* is sometimes known as "tapioca". It is a form of cassava flour (Cassava is a tropical plant with starchy roots—the roots are made into *Gari*). It is prepared through peeling of outer cassava tuber, and grating of cassava tubers. It is then packed tightly into sacks for a number of days and then released from sacks into large frying basins or an oven, where it is completely dehydrated.

<sup>2</sup> *Gara* is a type of cloth that is folded into different stitched design. After which, the cloth is immersed into different ink mixtures and left immersed for several days. The cloth is removed from the ink mixture, stitches moved, and washed thoroughly in water. It is then out in the sun and the dried cloth is beaten with wooden sticks on a flat wooden surface until the cloth is smooth.

average time of less than 1 hour). So far, improved wells do not save time from water gathering. When one comes to examine constraints on women's participation in rice farming, inadequate dry season water supply does not seem to be a major factor. Culturally defined notions about "male" and "female" tasks are the major consideration. As a consequence, women's contribution to farming at this period is minimal. The period when there does seem to be some clash between water gathering and farm work is April, when clearing of farm is carried out. However, even during this period the amount of time devoted to carrying water is not disproportionately high and the problem is ameliorated in most areas in Sierra Leone by the onset of rains. Hence, water carrying is not as crucial a domestic chore on Sierra Leone as is implied in some literature.

With regards to other potential benefit from improved well water provision, such as trade and craft-industrial initiatives dependent on abundant water, the communities under study show little evidence of potential in this respect. Until improved water supplies actually liberate women's time, it will be difficult to see what new activities might emerge. It seems unlikely on the present evidence, however, that dramatic economic benefits would accrue from rural water supply developments in rural Sierra Leone, especially where these developments are seen in isolation from broadly conceived development initiatives. In fact, evidence could be used much more to demystify the "women in development" approach as a by-product of western ethnocentric biases in development planning. This kind of development which is not based on research into the actual needs and living conditions of the women concerned, is at best completely irrelevant, and probably only adds to the debt burden of the receiving countries.

## REFERENCE

- Bah, O. M. (1986). "The Socio-Economic Impact of Improved Water Supplies in Sierra Leone", Unpublished University of London Ph. D. Thesis.
- Bah, O. M. (1987). "Improving Rural Water Supply in Sierra Leone", *Waterlines Journal*, Vol. 6, No. 1, July 1987. Published by the Intermediate Technology Development Group, London.
- Boserup, E. (1970). *Women's Roles in Economic Development*. George Allen and Unwin, London.
- Bradley, D. J., White, G. F. and White, A. U. (1972). *Drawers of Water : Domestic Water Use in East Africa*. University of Chicago Press.
- Cleave, J. H. (1974). *African Farmers: Labour Use in Development of Small Holder Agriculture*. Praeger Publishers, New York.
- Gwynne Jones, D. R. G., Mitchell, P. K., Harvey, M. E. and Swindell, K. (1978). *A New Geography of Sierra Leone*. Longmans, London,

- Mead Margaret (1975). *Male and Female: A Study of the Sexes in a Changing World*. Harmondsworth, Penguin Books, 1962, Reprinted 1975.
- Moyamba Integrated Agricultural Development Project (1982). *Appraisal Report*. Government Printer, Freetown.
- Nothern Integrated Agricultural Development Project (1976). *Progress Report*. Government Printer, Freetown.
- Richards, P. (1985) *Indigenous Agricultural Revolution*. Hutchinson and Co. (Publishers) Ltd. London
- Rogers, Barbara (1984). *The Domestication of Women: Discrimination in Developing Societies*. Tavistock Publications, London and New York.
- Sen Gita (1985)(ed). *The Dawn Report : Development Alternatives with Women for a New Era*, Prepared by the International Women's Conference, Nairobi, 1985. New Delhi, India.
- Spencer, D. S. C. (1976). "African Women in Agricultural Development: A Case Study in Sierra Leone". Occasional Paper, No. 9, *Department of Agricultural Economics and Extension*, Njala University College.
- Taylor, A. (1975). "African's Food Products: The Impact of Change on Rural Women", Published by the *American Geographic Society*, Vol. 5, pp 1-7
- Tommy, J. L. (1980). 'Women's Roles in Rice Production in Sierra Leone', Unpublished Paper Presented to the International Labour Organisation on *Sex Roles and West African Households*. Rome.
- United Nations (1978). *Report of the United Nations Water Conference*. Mar del Plata.
- Wiener, A. (1972). *The Role of Water in Development*. McGraw-Hill Book Company.
- Warner. D. (1974) "Evaluation of the Development Impact of Rural Water Supply Projects in East African Villages", Dissertation Abstract, *International*, 34, 12 part 1, 7925.

빈

면