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THE BUBA-TOMBALI WATER PROJECT, GUINEA-BISSAU

A PROCESS REVIEW

Carried out by Mette Jorstad,

Consultant - PROWESS (UNDP)

October 1986

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Rural Women in the Water Decade

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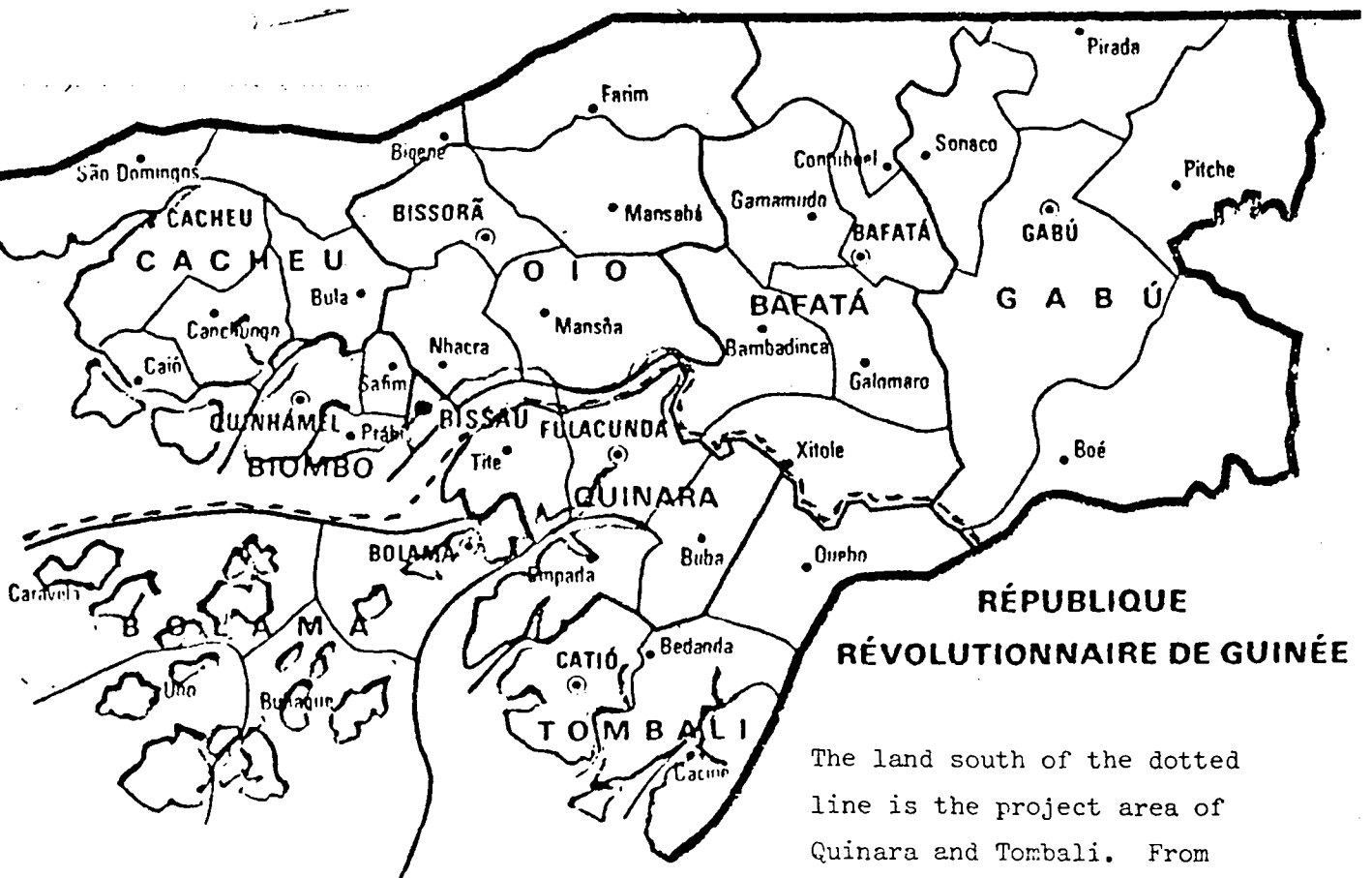
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THE BUBA-TOMBALI WATER PROJECT, GUINEA BISSAU

A Process Review Carried Out in October 1986

MAPA ADMINISTRATIVO
DA REPÚBLICA DA GUINÉ-BISSAU

⊙ Capital de região • Capital de sector



The land south of the dotted line is the project area of Quinara and Tombali. From 1987 Bolama Province is included.

PREFACE

Many agencies are beginning to realise that community participation is necessary for long-term viability of water supply and sanitation improvement projects, and that, within the community, it is the women who traditionally have responsibility for supplying the family with water, and whose active involvement is therefore crucial. However, documentation is lacking on experience of projects which have involved women, and on the process for and results of involving women. It is an INT/83/003-PROWESS objective to collect, analyse and disseminate information on such concrete experiences for use by planners who aim to include local community men and women in their project implementation.

Through a desk study in New York, the selection of one Asian and one African water and sanitation project was made from among projects which consciously have tried to involve local community men and women, and who have had substantial activities underway for three or more years, so that actual experience could be documented. The aim of the process reviews was to present and compare the inputs, strategies, techniques and results of the interventions.

Another criterion for the selection was that the target groups were not already mobilised and demanding assistance, i.e. they were chosen by outside agencies/organisations, based on observed need for assistance. This criterion was applied because it reflects the majority of cases in which rural populations are reached, and because one of the problems that usually has to be solved is to promote social organisation of the target communities in order to increase their absorptive capacity for development interventions.

The process reviews present:

- how the participation of local men and women in the development programmes were planned and redesigned over time;
- how the responsibility for different sectors and components were shared between institutions;
- what were the entry points and timing;
- what were the human resources available in the institutions and local communities;
- what were the staffing procedures and the up-grading of national personnel and beneficiaries' skills through training and education;

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- what was the extent of participation of local men and women, and in what roles, i.e.:
 - passive beneficiaries;
 - providers of free labour;
 - active agents during all stages, including planning.

The process reviews indicate the results of the involvement as to:

- what is the present or likely increase in basic resources, knowledge and influence of the local community men and women;
- what is the present or probable likelihood that the interventions will lead to a self-sustained development process.

The projects chosen are the Buba-Tombali water project of the Government of Guinea-Bissau, assisted by the *Stichting Nederlandse Vriwilligers (SNV), and the Bicchiwada Block Water Project in Rajasthan, executed by the Social Work and Research Centre (SWRC), Mada Village, and assisted by the Government of India, the Swedish International Development Authority (SIDA) and several other agencies. This is the case study on the Guinea-Bissau project.

It would have been difficult to carry out the process reviews without the assistance of the UNDP field offices in New Delhi and in Guinea Bissau, and without the support given by SIDA, New Delhi and the International Reference Centre (IRC), the Hague. The task would, however, have been impossible had it not been for the very generous private and professional cooperation given by the Social Work and Research Center, Mada Village, and the Buba-Tombali SNV team, Buba.

Thank you!

Mette Jorstad, PROWESS consultant
New York, 10 December 1986

*Netherlands Development Organization

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1. EXECUTIVE SUMMARY

The Buba-Tombali drinking water supply project, a project of the Government of Guinea-Bissau with Stichting Nederlandse Vrijwilligers (SNV) assistance, was well ahead of its time when, at the start in 1978, it had concrete plans for including the local communities in the planning and implementation. The planners were also aware that since community women are the main handlers of water and health/hygiene socialisation, their views and interests were of specific concern to the project.

Seven years ago, and before the start of the International Drinking Water Supply and Sanitation Decade in 1981, this realisation was rather avant-garde. Due to the exceptionally good record-keeping and frequent self-assessments, a process review may offer a rather unique opportunity to draw some general knowledge from this project's successes and failures.

The project objectives are in accordance with those of the Decade and most other drinking water supply projects: to improve the health situation and productivity of the target populations.

It is generally claimed that health benefits from an improved water supply are jeopardized unless the consumers use only the cleaner water all year round. In areas with high rainfall (Quinara and Tombali average 1500-2000 mm/year) and periodically much surface water, there is great risk that the target groups may resort to these more polluted sources during the rains, since time is of utmost value during this peak agricultural season.



Towards the end of the rains it is not easy to reach the project area, since the roads become rivers.

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The project therefore decided that a high coverage of new drinking water supplies was essential, and there are presently about 100 users/ supply point. The target population is 90 per cent of the total population of about 100,000 in Quinara and Tombali provinces, plus a more limited coverage of Balamas province from 1987. This commendable policy has caused the per capita cost of supplies to be about US\$ 87, which is rather higher than the suggested World Bank "economy budget" cost of US\$ 35. The operation, maintenance and repair cost is estimated at US\$ 1 per capita/year, including transport costs.

Boreholes are hand-augered and wells are hand-dug. A percussion rig is used for drilling boreholes where conditions do not allow digging or drilling by hand. Both types of supplies have partly been fitted with buckets and partly with handpumps (i.e. the Buba pump, which is produced by the project). Thus, the technology for providing dug and drilled wells, the production of pumps and cement rings for lining the wells and the expertise for production of spare parts and repair of supply points are now mastered by a number of national project personnel in the area.

There are two mobile maintenance teams servicing all pumps every month. Two villagers have been chosen by the local community at every supply point, a man to be responsible for the daily care of the installation and a woman responsible for keeping the surroundings clean. These two persons are also used as contact points for the health education team. A programme has started that will give more thorough technical training to the village maintenance man who is responsible for about 10-15 pumps. The population bears the cost for repairs.

The villagers are visited before the construction of the new supplies, and the community's opinions on the siting of the supply is solicited. Special attention is given to the women's point of view. Every resident married woman is interviewed in house-to-house visits by the project's social activation team, and decisions about siting is then made at community meetings.

At the completion of each supply point there is a handing-over ceremony. Three months later the project staff re-visit the supply to assess its technical function, water use, taste and the performance of the male and female caretakers.

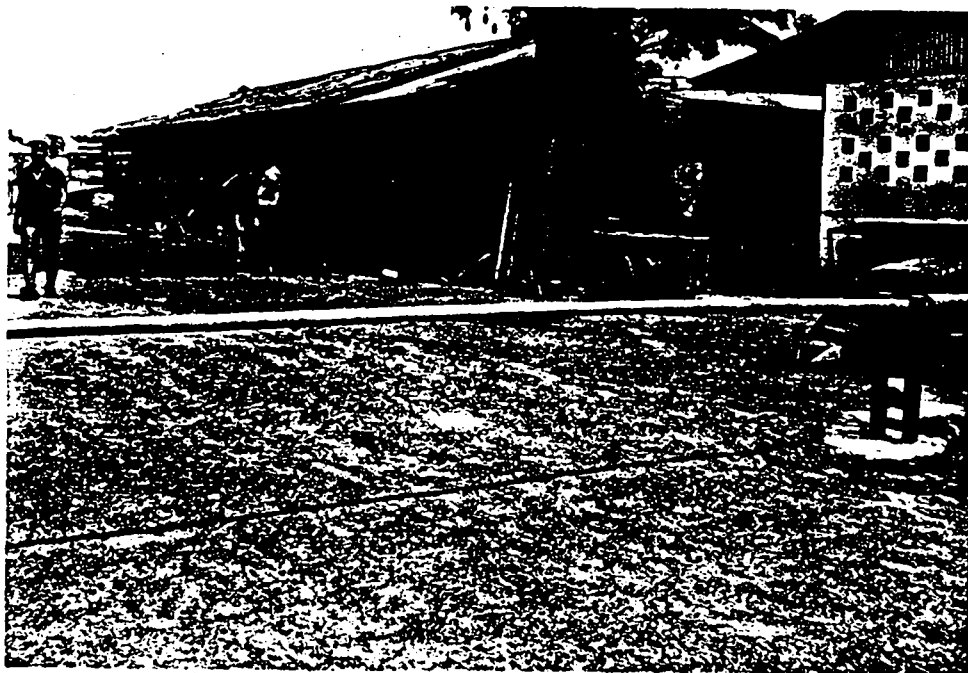
The project staff believe in the basic philosophy of providing participatory training techniques. Although advisable and path finding efforts were made, one reason for limited success could be that the methods need refining: In one case, while testing whether the women understood and could interpret a white and black photo, showing installation of a pump, communication took a different form, since they actively tried to provide in-put on the issue, and their interest was aroused. This indicates a possible direction that might be tried. Since optimal benefits from the water project still hinges on behavioural change by community women, which probably only will take place through continued communication and promotion by the social activation section, basic health workers and primary school teachers, it might be desirable to enhance this personnel's vast experience and

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dedication by exposing them to participatory training procedures. Much of their time is presently used to smoothen the functions of the installation team, and there are ongoing discussions on whether the social activation team should be upgraded, both as to numbers and as to educational skills.

The project performs yearly assessments of close to 100 per cent of the supplies. On all of the above occasions, health and hygiene education is given to the whole community, and specifically to the two caretakers, on proper water use, health and personal and environmental hygiene, in the form of basic messages. The cultivation of vegetables around the supply point and improved nutritional practices are promoted.

Technical workshops initiated by the project (metal, carpentry, electrical and vehicle repair) will be disassociated from the water project by the end of 1986.



The independence of the technical workshops
has been made visible.

They will form a self-sustained share-holder's cooperative, losely attached to the Ministry of Natural Resources and Industry, the shareholders being the 51

present national employees. This company will provide services and production of material items needed in the region on a profit-making basis. It will continue to provide these services also to the water project. In order to overcome the difficulties of foreign currency for the import of materials and parts needed, SNV will provide hard currency which the Company will refund them in pesos.

Some of the assessed and tangible results of the project are:

Function of Supplies

- o Ninety four per cent of the new supplies give adequate quantities and good quality water for at least 10 months per year.
- o A maximum of seven per cent of the installations are out of operation due to technical breakdowns at any given time.
- o Plans to improve both figures will be implemented in 1987.

Use of the supplies

- o About 70 per cent of the target population use only new supplies for household consumption purposes.
- o About 10 per cent use new supplies for other domestic purposes.
- o About 10 per cent do not use the new supplies because of distance. (Traditional sources are nearer)
- o About 9 per cent do not use the new supplies for unknown reasons.
- o The fairly high use of the supplies is assumed to be due to the communities being involved in the siting of the supplies and due to the high coverage.

Health education issues

- o There is some repollution of clean water.

Evaluations made in 17 sample villages before implementation started and 1 year afterwards showed that about 79 per cent of the new supplies had good or acceptable water quality, but about 20 per cent of the water carried to and stored in the homes was heavily re-polluted.

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Twenty per cent of the traditional sources had good or acceptable water quality, and about 25 per cent of this water was also repolluted before consumption.



Over the last years, water projects have started to test for repollution of water during and after collection. Repollution was found to be an average 20%, up to 50-80 percent in individual cases.

Although results are not entirely conclusive, it seems that the social activation section has had little or no impact on the population with their health and hygiene education.

- o Vegetable growing to improve nutrition and income generation. Evaluations show a decline in this practice after the installation of new supplies. The same conclusion as above must be made on the impact of health education.
- o About five per cent of the villages have started to make bricks for house construction after the installation of new water supplies.
- o About 13 per cent of the villages have constructed new access roads.

Involvement of Women

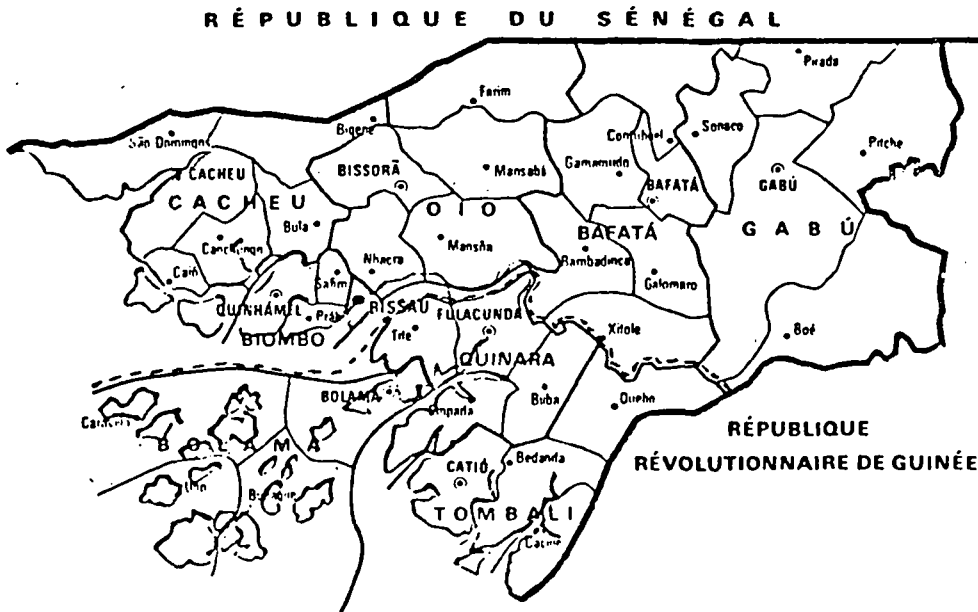
- o All aspects of the function of the supplies show good results, and these will be improved in the future by the project. The aspects of optimal water use and handling, which depend on the local

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communities, and specifically on the community women, show weaker results. The project planners and implementors are concerned with finding ways and means to improve communication and promote behavioural change with this crucial group. The most likely means to succeed is to provide further in-puts that will reduce the time constraints and daily workload of women and to introduce new communication approaches and techniques, for example participatory training techniques.

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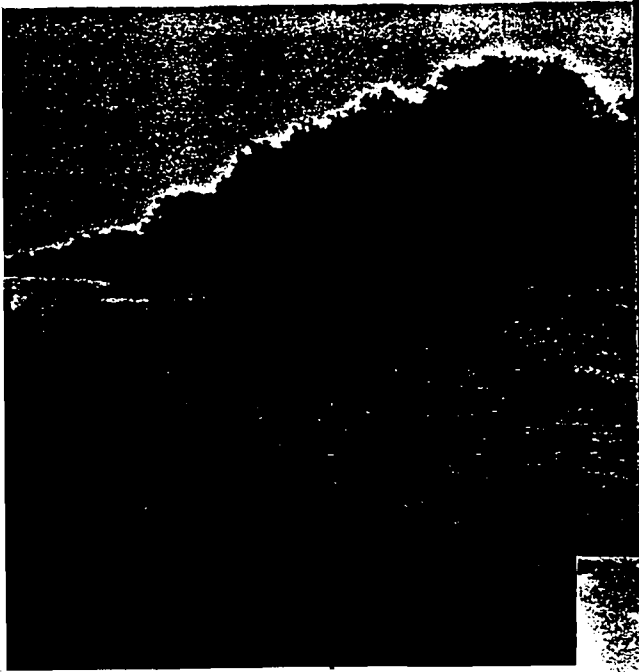
The land south of the dotted line is the project area.
From 1987, Bolama Province is included.

It seems early to suppose that the provision of safer water and the delivery of health and hygiene education is not enough to significantly improve the health situation due to the absence of data from a majority of the villages. Diarrhoea cases, for example, were diminishing in the villages with or without new water supply, but more so in the villages with a new supply. It is likely that productivity will be higher because there is more water available and more time saved from water collection for about one-third of the villages.

2. GUINEA BISSAU

2.1 The Background

Yearly rainfall in the South averages 2,000 mm, and the climate is tropical, with a rainy season. The main physical characteristics of the project area are winding



rivers and wide estuaries, with the tidal influence reaching as far inland as 120 km, and with a difference between high and low tide of about 4 m.

In the South of Guinea Bissau there is a total of 60 km of all-weather roads. Only one bridge connects Quinara and Tombali Provinces with the rest of the country and travelling can be even less safe than it looks from behind a dirty car window.



Guinea Bissau covers an area of 36,948 sq. miles and population density per square mile is about 21. Total population is about 900,000, whereof about 1/10th live in the Quinara and Tombali Provinces.¹

Ethnic distribution in Guinea Bissau is:

Balanta	30%	Mandinga	13%
Fula	20%	Pápel	7%
Manjaco	14%	Others	16%

Distribution by religion is approximately:

Animistic	60%
Muslim	35%
Catholic	5%

The republican independence already proclaimed in September 1973 by the nationalist movement which had fought and won the war was duly recognized by Lisbon in September 1974; and worldwide recognition of Guinea-Bissau and its PAIGC regime, under the leadership of President Luiz Cabral (brother of the assassinated founder of the PAIGC, Amílcar Cabral), followed at once. The new Government set about tackling the many severe problems left over from the colonial regime and the war, stating that its main concern in the field of politics was to extend its already existing structures of democratic participation, established in liberated areas during the war, and in the economic field, to give priority to the rural people and their agriculture.

The chaotic state of the economy may be the consequence of the war, but, even before it started, Guinea-Bissau was economically weak. Agriculture is the mainstay of the economy. It is entirely an African activity, since there are no European settlers. Among foodcrops rice is the staple food of the population. Swamp rice and upland rice amounted to about 70,000 tons per annum in the pre-war period, and in record years some of it was exported.

Cattle-breeding is a very important activity among Balanta and Muslim tribes of the interior.

There was about 24,000 wage-earners in 1978, of whom 19,000 were in Bissau and 62 per cent were state-employed. Industry is negligible except for food-processing and brewing.³

3. PROJECT POLICY AND OBJECTIVES

The objective of the project was to provide an adequate supply of safe water to the populations in two southern regions of Guinea-Bissau. Quantity as well as quality should be sufficient throughout the year, while walking distance should be limited.

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To try to achieve this with fairly simple techniques and at a moderate cost, the project was directed to the construction of shallow wells equipped with a pump or a bucket.

Experiences of similar projects in other developing countries have shown that constructing a well does not in itself guarantee that it will actually be used. For this reason, in the Buba-Tombali (also called Quinara-Tombali) project a separate section was created with the special task of stimulating the proper use of the new wells. Co-operation between this "social activation" section and the project's technical sections was promoted vigorously.

Based on the results of a preliminary study, the social activation section in the Buba-Tombali water supply project aimed particularly at bringing the well construction activities fully in line with the views of the village community, and at promoting proper use of the water from the wells.

Further aims were the introduction of health education, and the promotion of garden plot watering for the growing of vegetables. Consultation with villagers was expected to lead to demands of this type, as in some villages the drinking water situation is not seen as the greatest problem.

An important asset of the project's approach was that the objectives were not fixed, but could be adapted on the basis of regular evaluations.

In Guinea-Bissau a segregation exists between men and women. Although the official party tries to change this situation, women generally still are in a subordinate position. The women are responsible for most of the water supply tasks, in fact, for everything except watering the cattle and fetching water for preparing clay blocks. Thus, women, as the main users of the wells, were regarded as a main target group.¹

A Phase IV of the project, 1986-89, has amended the objectives (See 6).

3.1 Material In-puts

The first members of the SNV implementation team arrived in Guinea Bissau in early 1978 and started the construction of housing and office facilities in Buba.

The project was originally planned to produce, on an average, 150 wells per year. The social activation section would have preferred a lower target, since little experience existed initially on which they could base their activities, and therefore felt the target was too ambitious. The construction section preferred a higher rate (200 - 250 wells per year).

*Next page shows the actual rate of constructions performed

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Construction:	Water supplies	Fitted with handpumps
1978/79/80	134	97
80/81	184	109
81/82	160	86
82/83	98	40
83/84	83	27
84/85	49	11
85/86	50	16
Total	758	386

There is not only a trend, but a decision to give priority to installing winch and bucket superstructures over the last years. This is due to maintenance problems. Since May 1986, a further 36 handpumps have been changed to winch and bucket.

Of the 758 water points constructed, 452 are wells and 306 are boreholes, mainly hand-augered. Some of the boreholes are fitted with handpumps and some with winch and bucket.

Future rate of construction is planned at approximately 25 per year.

The project has provided necessary support facilities such as transportation, tools and implements, workshops, generators etc.

4. INSTITUTIONAL RESPONSIBILITIES AND CAPACITIES

Ministry of Natural Resources and Industry, Guinea Bissau

The project was established as a fully separate entity within the Ministry, as there was no existing organisational structure for the southern regions (apart from some skeletal services for a few small towns). Gradually, the Ministry has been assuming responsibility for salaries of national personnel and some other costs.

The Government of the Netherlands is providing funding and implementation through SNV (Stichting Nederlandse Vriwilligers)

Providing:

- Support to Rural water supply development in Quinara and Tombali.
- A geohydrological study of these regions.
- A regional water supply center to serve the southern regions of the country.
- Support to the central services of the Ministry in Bissau.

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Ministry of Education

The project contacts primary school teachers' meetings (10-12 villages), held every two weeks, to involve them in health and hygiene education for the students.

During the war the PAIGC laid great emphasis on improved educational services. Hampered by a serious lack of equipment and trained personnel, the massive literacy campaigns launched by the PAIGC have not significantly reduced the illiteracy rate, which was 90 per cent in 1977, compared with 99.7 per cent in the early 1960s. A programme of educational reform, including the provision of six years of primary education and three years of secondary education, was to be completed by 1982.

EDUCATION
(1977/78)

	SCHOOLS	TEACHERS	PUPILS
Basic 1st cycle	630	2,620	76,197
" " " (adults)			8,096
Basic 2nd cycle	14		5,603
" " " (adults)			3,360
<i>Ensino Geral Polivalente:</i>		540	
Liceus (secondary schools)	5		4,512
Technical school	1		76
Teacher-training colleges	3		284
TOTAL*	665	3,237	100,007

* Totals also include 13 *Instituto Amizade* schools which were attended by 1,779 pupils at all levels.

Source: *Comissariado de Estado da Educaçao Nacional*

Ministry of Health

Health Facilities

- Two National hospitals;
- Eight Provinces, none of which has a hospital;
- Four Districts in each province, each of which should have an up-graded health centre;
- Sections consist of 12-15 villages, which mostly have a basic health center with a nurse and health workers. Three months from installing the well, the supervision of the female caretakers is carried over from the animation section to the health workers. They are supposed to visit every village within a 5 km radius every 2-3 months. Villages of over 100 inhabitants, outside the 5 km radius of the health centres, will select 5-6 persons who will be trained by MOH on prevention and cure of the main six diseases: malaria, diarrhoea, wounds, headaches, conjunctivitis and coughs. Nutrition, hygiene and prevention of water-related diseases will also be taught. The trainers will be nurses, but these will not undergo special training for the task. Traditional Birth Attendants (TBAs) will have special courses to up-grade their skills.

4.1 Funding of the Project

Phase I	1978-81	DF1	12,000,000,-	
Phase II	1982-83	"	7,000,000,-	
Phase III	1984-86	"	4,377,000,-	
		*DF1	23,377,000,-	(US\$ 10 million)

New Agreement:

Phase IV	1986-89			
The Ministry of Planning and International Cooperation				
Guinea Bissau		DF1	2,820,000,-	(US\$ 1.2 million)
The Dutch Ministry of Development Cooperation		DF1	2,610,000,-	(US\$ 1.1 million)

* Amounts are available only in Dutch Guilders - DF1

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4.2 Staffing

As per October 1986, the following categories of staff are working on the project:

		<u>Male / Female</u>	
The Company Workshops	51 nationals	51 /	-
Biregional Centre *	55 nationals	51 /	4
The Project	27 nationals	25 /	2
The Project	6 Dutch expatriates	5 /	1

* Part of the initial water project, see 6.

During the early years of the project, there was a maximum of 12 SNV expatriates. Most had Guinean counterparts, with their own job descriptions, who have gradually taken over the positions and responsibilities. By January 1985 there were still 10 expatriates, and this will be reduced to half in 1987.

4.3 Training and Education of National Staff

The Guinean project staff have, on the average, very little formal education. Since the provision of new water supplies comes to a standstill during the two months of heavy rains every year, the project gives one of these months as a holiday, and the second month is used for formal education of the project employees. During slacker working weeks, they have also been given formal education homework to do, with examples from their practical work.

Courses in administration and management are given by the Technical Training Centre in Bissau, and these will be completed by four month courses in Portugal. Some of the national project staff have completed this cycle, and four are presently abroad for studies.

The animators in the social activation section have 3-4 years of primary schooling, apart from the leader and the second-in-command, who have 3 and 2 years respectively of secondary schooling. There are a total of 6 animators, of which 4 are women and 2 are men. The latter are also drivers. All but one has been functioning in this capacity (animators) since 1978. They were given on-the-job training by an expatriate social scientist at the inception of the project. One of the techniques used was that they brought tape recorders with them to the villages, and when returning to the project the trainer would go through the tapes with them, giving advice on communication techniques.

The animators are from the project area and were chosen on the criteria of speaking the two main local languages plus creole or portuguese, of a certain age and being married/divorced mothers. Their acceptance by the local communities was important, and so was their ability to communicate with villagers. Two female animators/health and hygiene educationalists are travelling with the mobile maintenance teams, and these are government employees. The other female animators are hired by the project, and what will

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happen to them when the project phases out is uncertain. However, consultations between SNV and the Ministry of Natural Resources and Industry indicate that the Government appreciates the necessity of health and hygiene education in connection with an improved water supply and therefore, that the animators will become government employees. Apart from the two months of heavy rains, the animators visit and live in the target villages for about 20 days every month.

The animators promote improved water-related health and hygiene behaviour, nutrition and vegetable growing, fencing and environmental sanitation. Over the years, and with an increasing number of new supplies, the emphasis is on water-related health and hygiene behaviour, with little attention given to the other subjects and no attention is given to fencing of the supply. (Due to the frequent collapse of the fence structures the population lost interest in repairs. Lack of durable wood in the South is a source of the problem.)

4.4 Entry Points

In 1977, as a result of consultations between the Government of Guinea-Bissau and the Government of The Netherlands, an identification mission was carried out by members of the Dutch "Working Group on Water Resources Development".

The mission proposed a project involving:

- rural water supply development in the regions of Quinara and Tombali;
- a geohydrological study of these regions;
- establishing a regional water supply centre to serve the southern regions of Guinea-Bissau;
- support to the central services of the Ministry in the capital city, Bissau.

A three-month pilot phase of the project involving the construction of 30 wells, began in the last months of 1978, after which the execution of the actual project was initiated in March 1979. A Dutch consulting engineer's firm, experienced in shallow well projects, assisted in the preparation and execution of the pilot project.

This pilot project comprised mainly the following:

- a survey to obtain a general idea of the geohydrological situation in the area; (a number of hand-drilled test holes were made and electrical resistivity soundings were taken);

/...

- an experiment on well construction techniques;
- a socio-economic survey of the area to define the task of the section which was going to promote the social activation part of the project¹.

5. INTERVENTION STRATEGIES

When the water supply project starts in a new geographical area, a regional meeting is called, inviting representatives from all targeted village committees. These meetings take place some months in advance of implementation. In the intervening time the hydrogeological team and the social activation team will visit each village.

5.1 Community Involvement - Male/Female

All selected villages are visited and a map of each is made for the files. There is first a village meeting designed to assess the basic structures such as:

- number of inhabitants, households, organisations and educated persons;
- ethnic groups;
- how many of the villagers, and how many of the female villagers would prefer to improve the existing source rather than getting a new one;
- villagers' willingness and responsibility for constructing an access road if none exists, for providing voluntary labour to assist in constructing the supply, for providing cooking facilities and a place to sleep for the animation team and the construction team;
- description of the traditional sources used as to yield, kind, ownership, taste, cleanliness, protection and reliability;
- use of different water sources for different purposes;
- agricultural practices and access/ownership of land, livestock, fruit gardens, latrines and bath-houses, and construction materials of homes.

Each married woman in every household is then interviewed separately on some of the same questions plus on weaning habits and nutrition for babies and children. A series of photographs is shown, demonstrating how the new supply will be constructed and should be used.

/...

There is a handing-over ceremony for the new or improved water supply, at which time another questionnaire is gone through during a village meeting:

- During the construction of the new supply, who provided what in-put?
- Advice is given on the use of the new and old supplies for different purposes.
- Discussions take place on the tasks and responsibilities for personal and environmental hygiene behaviour, the importance of growing vegetables and fruit trees and improved nutritional practices for children.
- Selling of improved vegetable seeds to the villagers.
- Discussions on the acceptability of the new supply as to taste, yield and reliability.
- Handing over of grease to the male villager responsible for lubricating the pump and a log-book to keep track of the function of the pump.

There are yearly evaluations when the questionnaire will focus on the use, yield and function of the supplies, as stated by villagers and as observed by the social activation and technical teams.

The project realised from the start that in order to communicate with women, who are the main handlers of water and socializers of children, female promoters would be a necessity. Since these should be persons respected by the communities, young women were not suitable. Older women would often be conservative, and therefore mothers with a few younger children were found to be the best alternative. These are paid by the project, and usually go to live in a village in a Section where the water project is being introduced and implemented, for 10 days at a time, bringing their smaller children along. For the promoters this is a tough job, and although they live with the villagers for these fairly extended periods most of the year, there still seems to be communication barriers. The view has been presented that "the villagers felt that the promoters were arrogant and conducted meetings like instructors".² One way to change such view according to project personnel is for promoters to use a more practical approach; rather than give instructions it would be more effective to work with women showing them how tasks could be accomplished.

During field visits, it was observed that communication with individual women mainly had two forms:

- direct questions to be answered on water use and weaning of children;

² Rural Water Supply Development: The Buba Tombali Water Supply Project, Guinea Bissau, 1978-81

- messages delivered on desired health and hygiene behaviour and vegetable gardening. The women are also informed of the technical construction and function of the supplies, and this is accompanied by photographs which are shown and explained. Although it is by no means certain that the women can understand and interpret the two-dimensional black and white pictures, it was felt that the showing of them would at least serve as a reminder to the promoters to explain the technicalities of the new supply.

Village women do not seem inclined to spend time on health education, and several reasons for this are obvious:

- their work load is already very heavy;
- a new drinking water supply is not always a high priority for them;
- they do not know about the connection between water and water-related disease, or about food and severe malnutritional status. In the past the animators demonstrated how to prepare porridge for children to improve the nutritional contents. This practice was discontinued because in hardly any village did mothers continue as taught and in some cases lacked the means.

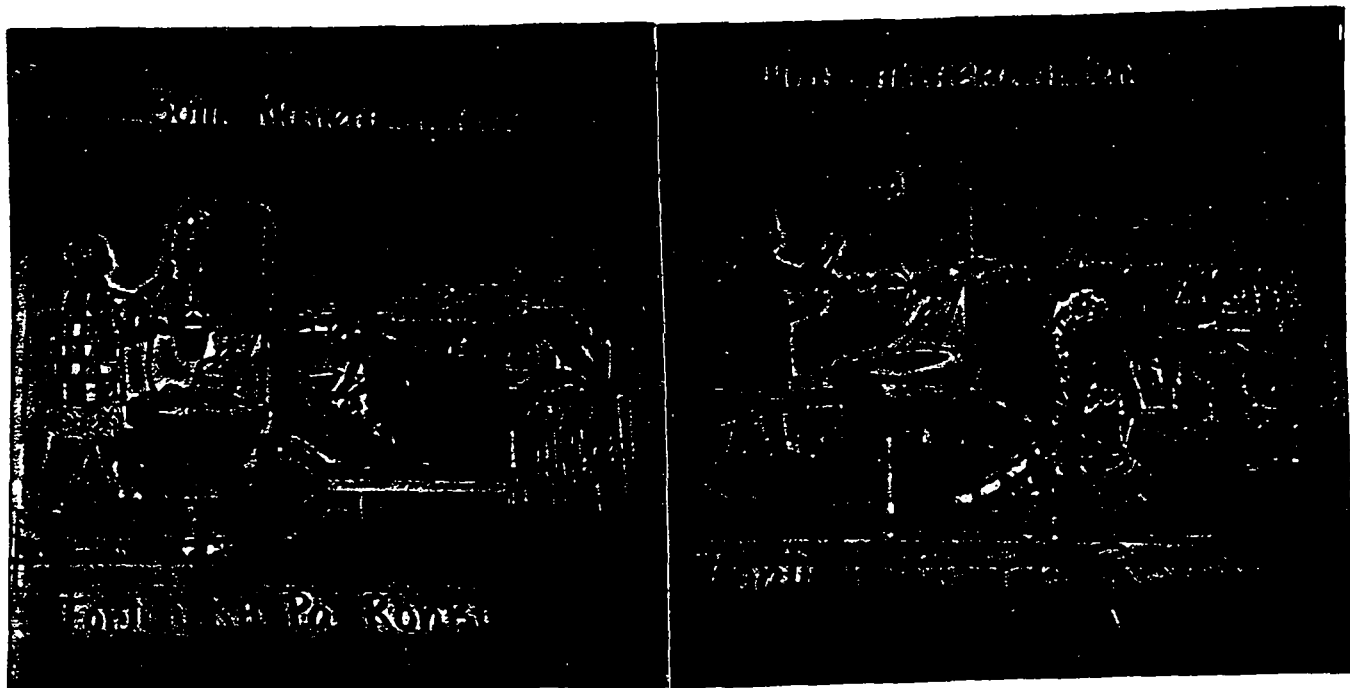
5.2 Extension Work Schedules

a. Assessment is made of how many supplies each village is entitled to according to established criteria. The hydrogeological team will test drill. House-to-house visits are carried out and each wife is interviewed and briefed on water use and supply construction.

b. A handing over ceremony is held at completion of construction and posters are handed over to the man selected for maintenance of the superstructure and to the woman responsible for keeping the surroundings of the supply point clean. The posters show good and bad water-related behaviour. Vegetable growing close to the water supply point is promoted.



c. The supply is revisited about three months after handing over to assess the technical condition, water use and water taste, and in order to assess the job performance of the two selected villagers responsible for looking after the supply.



d. The mobile repair teams visits every new supply every 1-2 months, and repeat messages on the relationship between health, hygiene and water.

e. The social section animators should return every three months to promote knowledge and change of behaviour related to good water use. However, with the increasing number of supplies their capacity to carry out these visits is too small.

f. Therefore, the project co-operates with basic health personnel and primary school teachers, who will, to a certain degree, strengthen the extension services.

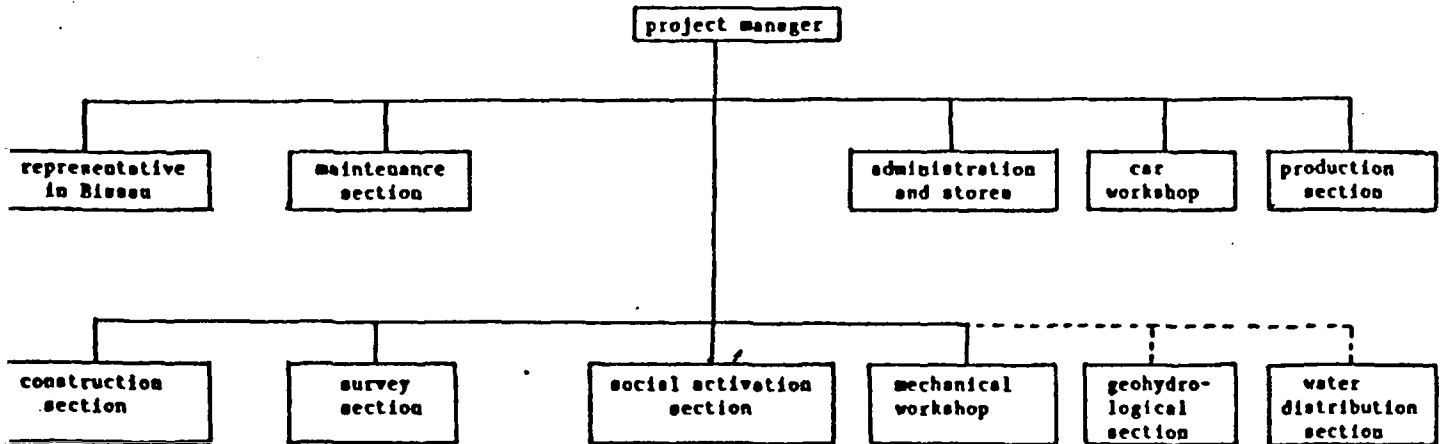
g. There is a yearly assessment of approximately 100 per cent of the new supplies.

6. REDESIGN AND ADJUSTMENTS

From its inception, the SNV project functioned independently within the Ministry of Natural Resources and Industry. All local employees were hired directly by the project. This had important advantages, but ways and means were sought to transfer parts of the local staff and costs to the Ministry.

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The Buba-Tombali project organisation the first years.¹



The positions shown in the organogram were all held by expatriates.

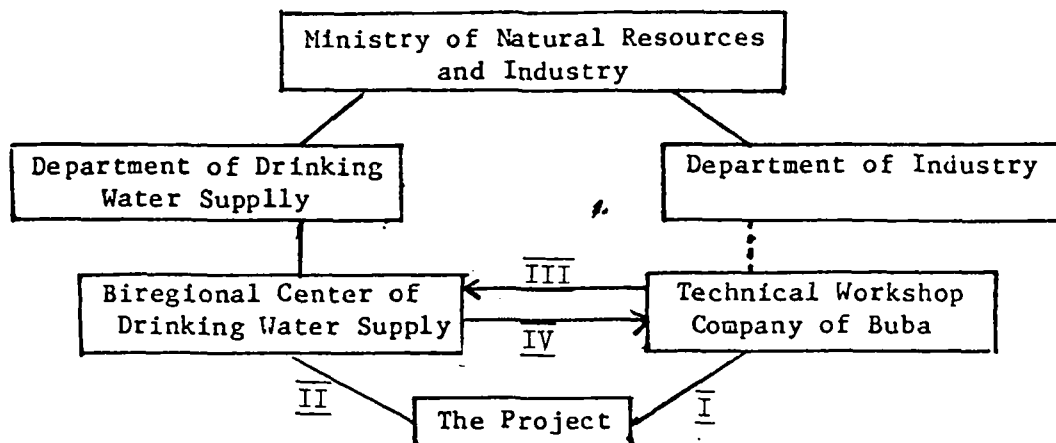
Gradually, the Ministry has taken over the responsibility for the national employees on the project.

SNV, in cooperation with the Ministry of Natural Resources and Industry, have decided on a prolongation. Phase IV starts at the end of 1986, which provides for re-organization of the project, due to revised objectives, which are:

- a) Make the Technology Workshops (the Company workshops) independent, as a private enterprise to be taken over by the now approximately 50 Guinean employees working there.
- b) Supply materials for the drinking water supply project.
- c) Construct about 15 boreholes per year in a third Province, i.e. Bolama.
- d) Solve technical problems with the bottom filter rings.

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The Government of Guinea Bissau does not have the capacity to take over all project activities, especially since other multilateral and bilateral organizations are phasing out during this time. The organizational structure will by the end of 1986 look as follows:

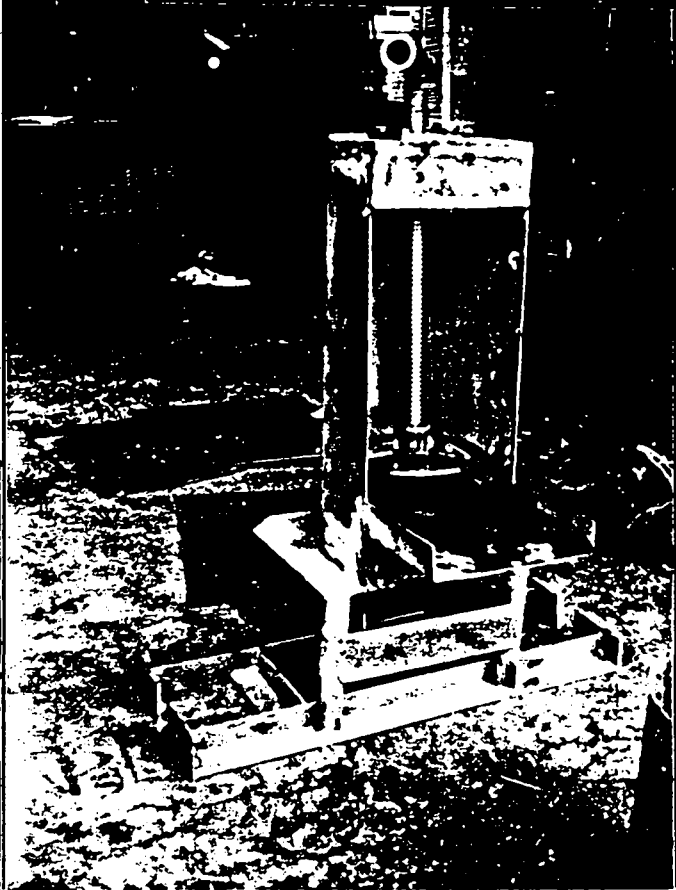
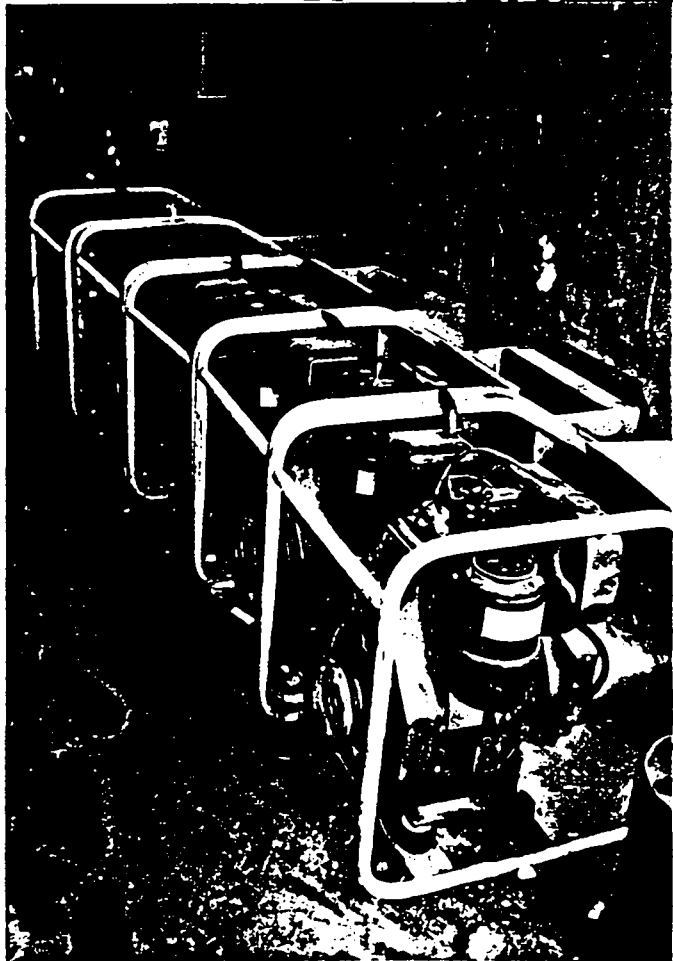
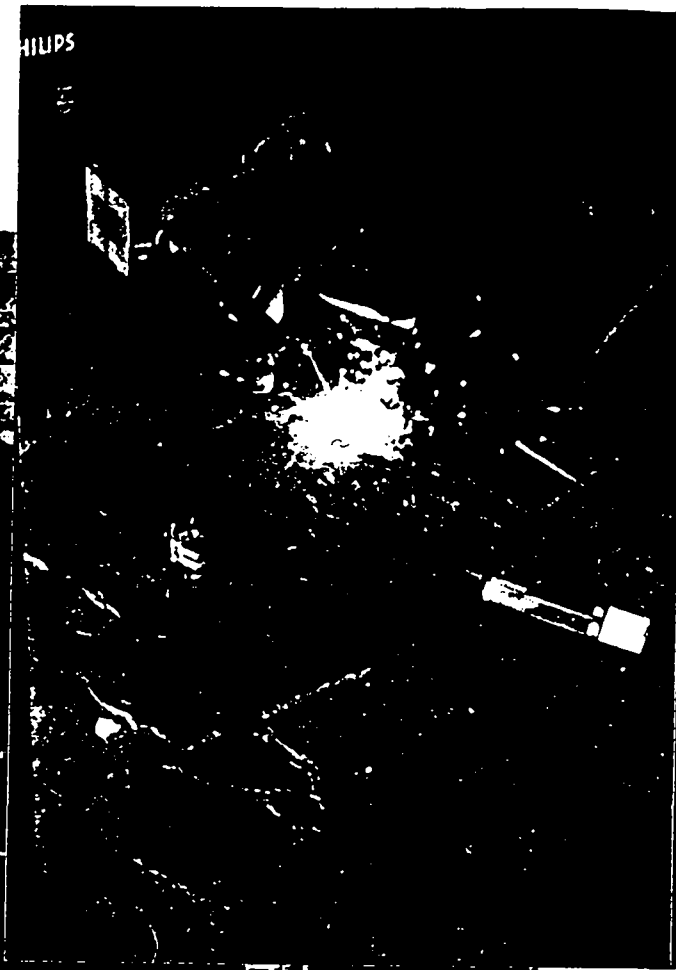
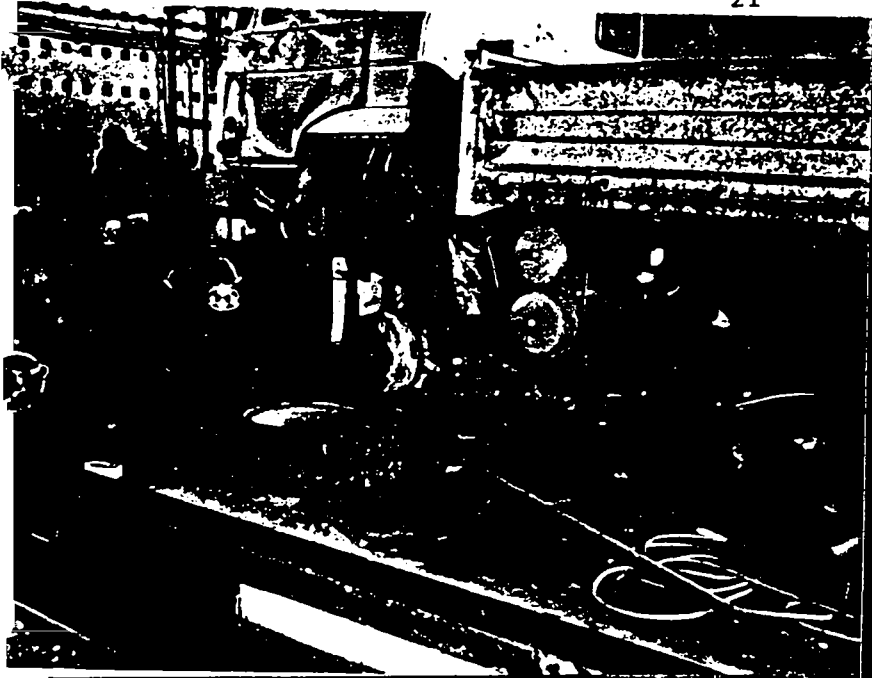


- I. - Provision of of materials and machines. Purchases effectuated in foreign exchange and sold to the Company in pesos.
 - Technical assistance will be provided.
 - Generation of electricity, which the Company will pay for at a non-profit basis.
- II. - Delivery of construction materials for 25-30 new supplies per year, as a grant.
 - Provision of electricity, paid for at cost price.
- III. - Maintenance and repair of the vehicles and hardware.
- IV. - Transfer of ownership of stock and machines.

The Company consists of:

- Vehicle and hardware repair workshop
- Production of hardware
- Carpentry workshop
- Electrical department

HILIPS



Generators from other provinces in Guinea Bissau have been repaired.

Production of hard-ware. An oil press.

/...

Funding of Supplies

At the beginning of the project, it was a condition for getting a new supply that the villagers would fence it. They did, but the fences soon fell down or vanished. Knowing that a project in the Northern part of the country has succeeded in getting good and permanent fencing put up by the villagers (by closing the supply point until the fencing was acceptable), SNV is considering to try the same approach in the Quinara-Tombali region, at least where the cattle population is large.

Changes in Project Activities - Social Activation

At its inception, the project was meant to be an integrated development project, including vegetable gardening, purchase/production of soap for hygiene purposes, nutrition education based on locally available food, provision of technical services by the project to the local population, promotion of optimal water use and preventive maintenance. Several of these activities have been discontinued or have received little attention.

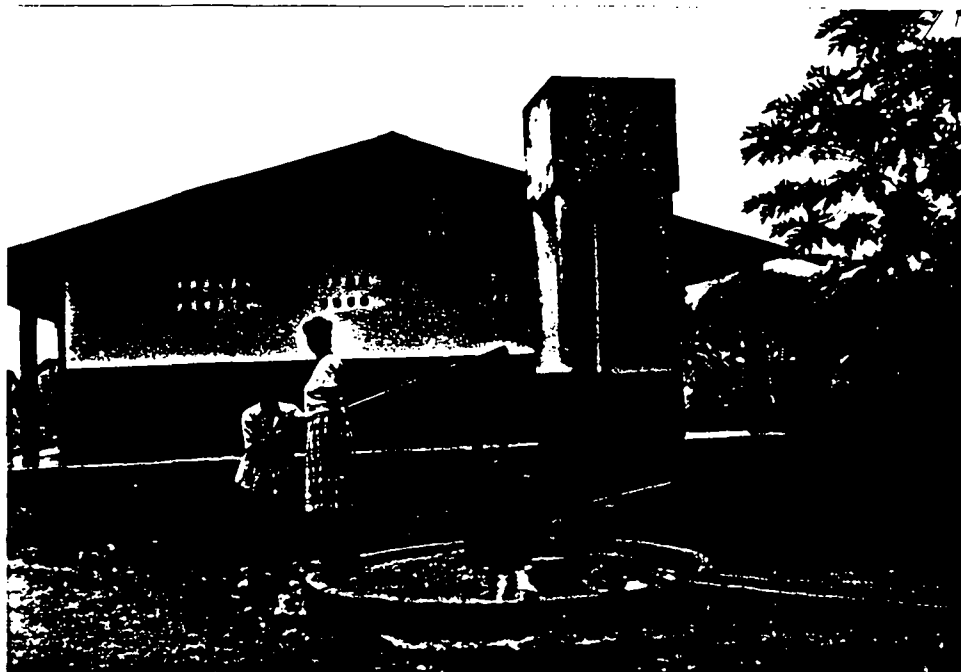
The main focus is on giving technical assistance related to the construction of drinking water supplies, on the use of these supplies and on hygiene education. The social activation team is now mainly occupied by preparing the communities for the construction team's arrival, in organizing the communities to provide free labor, sleeping quarters and cooking services. More time is used to make these functions go smoothly than in educating and training the local communities in improved health and hygiene behaviour.

The project had initially planned and hoped for a more active participation of women. This was found to be very difficult, due to

- a) "Men are usually the decision-makers". (This is a common statement by animators and village women)
- b) Women's workload is so heavy that they will rarely come to meetings.

Technology

The Buba handpump. Here it is used to pump water into a storage tank for a health center. One hour of pumping satisfies the need for piped water.



The project initially installed the Dutch produced Kangaroo foot-pump. The users did not like it because the movements to draw water could be interpreted as obscene. The project then developed the Buba handpump for installation. This is locally produced, from imported materials.

Because of the acidity of the water in the region, iron pump rods are gradually being changed to PVC ones.

To facilitate maintenance and in some cases to resolve the iron problem, handpumps have to some extent been changed to winch and bucket, although evaluation results on the quality of water show that handpumps provide cleaner water.

The project used a percussion rig for drilling in cases where water has to be found close to the point of consumption, such as for hospitals and health centers. However, in order to reduce dependence on imported energy, high quality access roads and high levels of technical knowledge, the later years have seen only hand-dug and hand-drilled supplies.

Criteria for Getting a New Supply/Supplies

At the beginning, villages or parts of villages numbering only 50 inhabitants could get a supply. Although this criterion is still combined with present difficult water situations (distance, pollution, yield), minimum population now approaches 100.

Rate of Installation

When the project is completed in 1989, the Ministry of Natural Resources will have full responsibility for the functioning of the water centre. The rate of installation will be reduced to about 25 supplies per year in Quinara and Tombali provinces. In Bolama, a third province, 15 supplies per year will be installed.

The reduced rate in the initial Provinces is due to the fact that the target of reaching 90 per cent of the population in these Provinces is almost attained.

7. RESULTS

7.1 Health

According to WHO Minimum Evaluation Procedures, the ultimate objectives of allocating resources for water supply and sanitation investments are to improve the health, welfare, and economic status of the users of the facilities. These objectives cannot be fully achieved unless the facilities are:

- a) Functioning, i.e. reliably giving improved quality and quantity of water for household consumption.
- b) Being used by the target populations. If and when the target group continuously uses an improved quality of water for consumption and increased quantities of water for washing, it can be assumed that there will be an improvement in their health situation. This requires some changes in their behavioural patterns.

The Buba-Tombali water project provides systematic data collection on the first two points.

7.1.1 Coverage, Reliability, and Accessibility

The project policy has been that in this region, with much surface water during the rains, there is need for a good coverage (about 100 persons per supply point) if people are to change from the traditional to the new supply.

Since walking distance has been found to be the single most important factor determining the use of a supply (see 7.1.4), the project has had to reduce the number of inhabitants required to get a new supply, especially in the case of the Balanta, the largest ethnic group in the country, who have a

This traditional source is also used for drinking. Village women often find that these sources are quicker and easier to use than wells.



scattered settlement pattern and who traditionally have one water supply point per household (a dug hole). Since accessibility is an important factor, the coverage is rather high, i.e. the project has a low ratio consumers/supply.

Operation and Maintenance

The new government policy is that the consumers should pay parts of the repair costs for new or improved water supplies. The project has started to train village water operators at 3-4 week courses. Each operator will be responsible for 10-15 pumps within a 5 km radius. Each type of repair will have a fixed price which can be paid in cash or kind to the operators who are administered by the project. The project keeps adequate supplies of all spare parts. The cost of maintenance is calculated to average Pesos 250 (US\$ 1) per person per year, including spare parts. The village maintenance workers are getting bicycle loans from the project plus tools to enable them to do other work besides repairing pumps. The population pays them for their services. They are not government salaried and will receive no compensation per kilometer travelled.

The project has trained five mobile maintenance teams for more heavy repair work, whereof two are in operation. Each team consists of five technicians who are government paid, and one community extension worker (female) who is paid by the project.

Each pump is visited every month, and systematic record-keeping shows that only a small percentage of the supplies are out of operation at any given time, due to mechanical break-downs, since 1984.

Function of handpumps:	Percentage of pump breakdowns at any given time
1983	7.2
1984	8.0
1985	6.5
1986	5.5

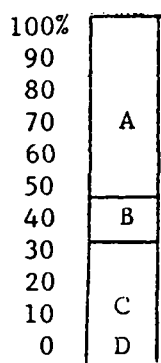
Yield and Reliability of Supplies

94 per cent of the new supplies give a minimum of 10 months supply of good quality water per year. 61 per cent of the supplies have no problem with inadequacy of water yield. This figure will be improved in 1987 with the deepening of wells. If/when wells dry up, villagers have to resort to the traditional sources which are often at some distance.

Tombali	supplies visited	dry %	insufficient %	total problems %
1984	350	15	20	35
1985	370	17	24	41
1986	399	24	23	47
<u>Quinara</u>				
1984	242	11	14	25
1985	263	13	18	31
1986	289	48	23	31

These results are summarised and will be attended to as follows:

/...



- A = No problems
- B = To be deepened by 1 meter in 1986
- C = Bottom filter ring problem, technical solutions are being sought.
- D = Dried out due to reduced rains over the last years (see below), or other unknown causes.

Rainfall in Quinara and Tombali Provinces

Year	mm	No. of stations measuring
1979	1977	3
1980	1701	13
1981	1944	14
1982	1905	14
1983	1766	14
1984	1418	12
1985	1499	10

Six per cent of the new water supplies were dry in 1984, and in 1985 21 per cent of them were dry.

7.1.2. Water Quality

There are different standards for what can be termed good/ acceptable/ not acceptable water for consumption:

WHO guidelines: national standard	/	* LNSP (Guinea Bissau national standard)
Less than 10 Coliform/100ml water = good		/100 Coliform/100 ml water = good
		/100-500 Coliform/100 ml water = acceptable
		/500 Coliform/100 ml water = not acceptable
0 E-coli/100 ml water = good		/ 10 E-coli/100 ml water = acceptable

A sample survey performed in 1985 on traditional and new supplies in Quinara and Tombali gave the following results on the LNSP standard:

	Coliform		E-coli	
	Trad.	New	Trad.	New
Good water	29%	79%	43%	73%
Acceptable	14%	14%	--	--
Not acceptable	57%	7%	57%	27%

It was found that supplies fitted with handpumps had better quality water than the open wells.

* LNSP - National Laboratory of Public Health (Laboratorio Nacional de Saude Publica)

Quality of water - taste

Sampling	Iron	Salt	Cement	Not used for drinking
1982	21%	12%	0%	13%
1983	21%	12%	13%	11%
1984	15%	13%	6%	10%
1985	14%	8%	3%	10%
1986	11%	9%	3%	9%

Handpumps have been more affected by iron content/taste because of the iron pump-rod. Fifty nine of these have been changed to PVC pump-rods. Concerning the cement content/taste, this improves over time with use of the supply.



Testing of water resistivity, i.e. the content of iron (minerals) in the water of new or improved supply points.

Repollution of Water during Collection, Transport and Storage

The old and new sources that were found to have good water formed the basis for the next issue addressed by the sample survey. The project wanted to know what was the rate of repollution of clean water before consumption.

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It was found that for both the traditional and the new supplies about 25 per cent of the samples taken from the water containers were heavily repolluted. It was found that out of the 12 wells that had good water, only five had good water in the storage vessels, four had acceptable water and three had non-acceptable water. The rate of repollution was about the same for the traditional and new supplies. There is thus some degree of re-pollution in about 60 per cent of the cases and in 25 per cent of the cases clean water has become unacceptable for consumption.

Cleanliness of Surroundings of the Supplies

Yearly surveys have found that about half of the supply surroundings are clean. There are, however, great variations between the different villages, and also great variations in the same village over different periods of time - in spite of the fact that most caretakers have been permanent for several years. The sectoral differences range from 84 per cent clean in Catio Ilhas, but only 34 per cent in Empada, whereas Cacine had 76 per cent clean in 1985, but only 47 per cent in 1986. One might assume that the number of visits by the social activities section might influence the results, but as will be seen later (7.1.4) existing information does not corroborate this assumption.

7.1.3 Water Use

In March, April, May 1985 studies were made of 17 villages that had been selected for new/improved water supplies, but where implementation had not yet started. The same villages were re-visited in March, April, May 1986 in order to assess some of the effects of the project:

- 73 per cent of the villages increased their use of water for household purposes by 5 litre/capita/day.
- 23 per cent (four villages) decreased consumption, two of the villages because the supply went dry, two villages for unknown reasons.
- A positive correlation was found between few users of a supply point and an increase in quantities used.
- 71 per cent of the target population say they use only the new supplies for consumption
- 10 per cent of the target population say they use new supplies for other household purposes.
- 10 per cent of the target population say they do not use the new supplies because the distance is greater than to the old supply.
- Nine per cent of the target population say they do not use the project supplies for other reasons, e.g. the water is not running (flowing), traditional beliefs in sacred places, abodes of spirits, etc.

/...

In 1985 an in-depth survey was performed in 60 villages.

In 35 of the 60 villages 100% of the population say they use only the new supply for all purposes.

In 8 of the 60 villages 75-99% of the population say they use only the new supply for all purposes.

In 11 of the 60 villages 50-74% of the population say they use only the new supply for all purposes.

In 6 of the 60 villages less than 50% of the population say they use only the new supply for all purposes.

For those who use the traditional source, the reasons given were:

- in 36 per cent of the cases the new supply had gone dry;
- in 28 per cent of the cases the taste was bad (salt, cement, iron);
- in 36 per cent of the cases the reasons are not known.

Reasons given for choosing to use the traditional/new supply for consumption:

	New supply	Traditional source
Distance	77%	52%
Clean water	12%	2%
Taste	26%	38%
Running water	1%	6%
Easy collection	1%	--
Custom	--	2%
Other	4%	--

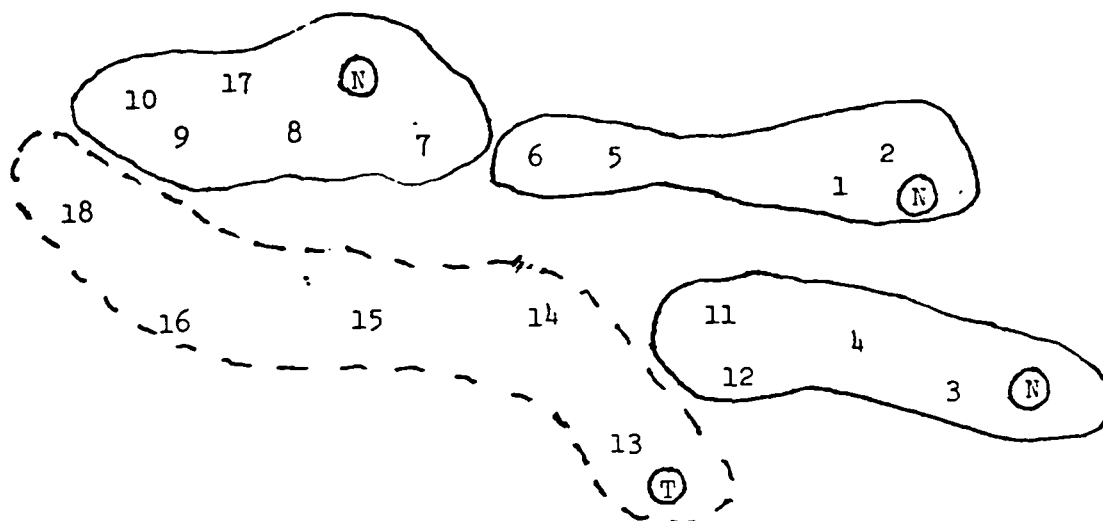
Thus, distance and taste seem by far the major factors influencing choice of source for water consumption.

Obviously, when the drinking water situation at the traditional supplies become difficult during the dry season, the use of the new supplies is high. In 50% of the cases where villagers do not use the new supply for drinking water, and where they state that the reason for this is the high content of salt and/or iron, this has been corroborated by tests. In the remaining 50% of the cases where this is given as the reason, tests have not shown the salt and/or iron content to be high and significantly influencing the taste.

The above 60-village survey supplied interesting maps of the use of traditional/new supplies in all of these villages. Three sample maps are shown on the next pages. Clearly, distance is not always the decisive factor, and as shown above, taste is a controversial issue. Some of the maps raise more questions than they answer, and it might be very interesting if a development research organization could undertake a study of who are the decision makers and what are the deeper issues that determine the use of the traditional or new supply.

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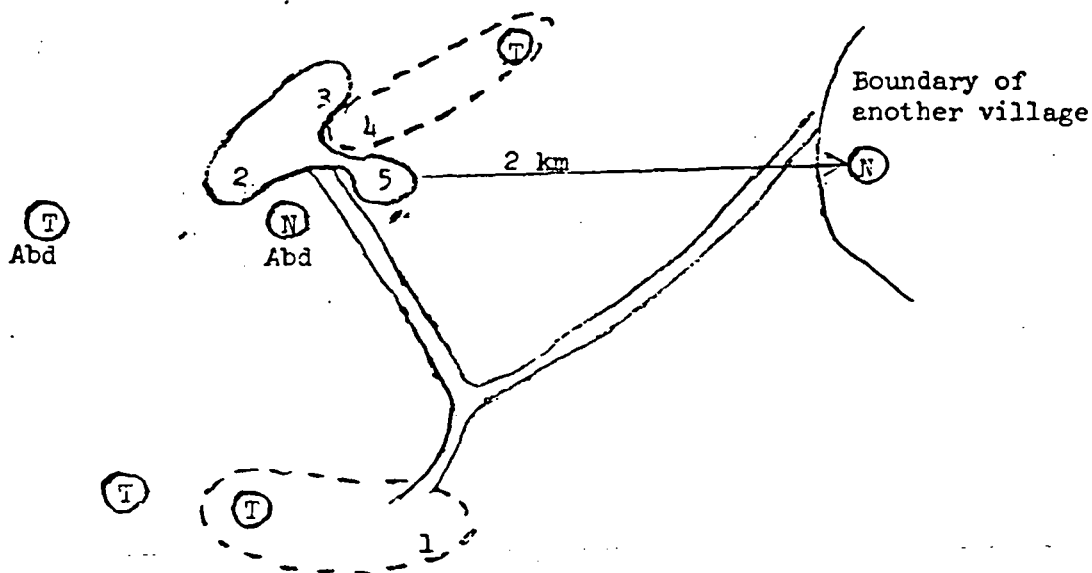
Cadique Village



Motives	New Supply	Traditional Supply
Close	11	2
Better taste	2	3
Total households	13	5

Numbers:	File number of household
N:	New supply
Dotted line:	Traditional supply users
Firm line:	Households using new supply

Gambaque Village



Motives	New Supply	Traditional supply
Close		1
Better taste		1
Abandon new because of salty taste	3	
Total households	3	2

Changes over time:

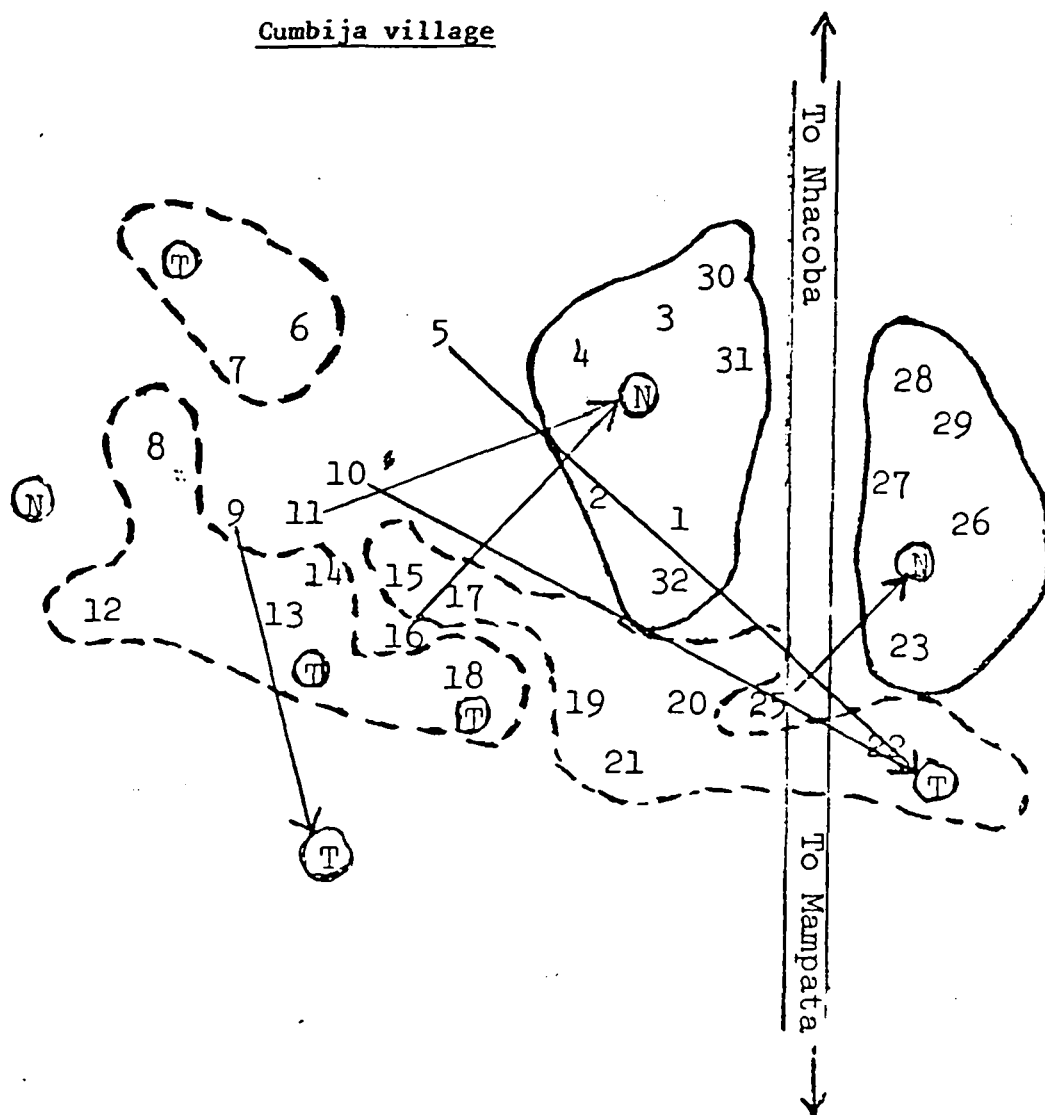
May 1985 Villagers say they use the new supply for washing clothes and making palm oil.

July 1985 Villagers say they use new supply for making palm oil.

May 1986 Villagers say they use new supply for drinking water, although it has a salty taste.

Numbers	File number of household
N:	New Supply
T:	Traditional Supply
Dotted Line:	Households using traditional supply for drinking
Abd:	Abandoned

Cumbija village



Motives for use of	New Supply	Traditional Supply
Close	12	5
Better taste	2	8
More accessible	1	1
Clean Water	-	2
Habit	-	1
Total Households	15	17

Numbers File number of household
 N: New Supply
 T: Traditional Supply
 Dotted Line: Households using traditional source
 Firm Line: Households using new supply

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7.1.5 Factors affecting use

An objective of the in-depth survey of the 60 villages was to test some hypotheses on what conditions constitute a good basis for and indication of behavioural change concerning the use of the new source versus of the traditional source for household consumption. The sample populations were divided into different categories related to the different issues, and the results were analysed by the chi-square method. The calculations to corroborate the hypotheses should show:

3.84 at the 95 per cent significance level

2.71 at the 90 per cent significance level.

The hypotheses and results were: '

a) A low ratio of consumers per supply point.

The sample: 30 villages with a ratio of 18-75 consumers/supply point
30 " " " " " " 76-283 " " "

Result: 0.61

b) Difficult traditional water situation.

A difficult water situation was defined as:

- i. the traditional source went dry for shorter or longer periods of every year;
- ii. a walking distance of 1 km or more

The sample: Difficult - 18 villages
Not difficult - 34 villages
Unknown - 8 villages

Result: 3.37

c) A higher level of technology will facilitate behavioural change.

The sample: 36 villages with one or more handpumps each
16 villages with one or more wells fitted with winch and bucket
8 villages with both handpumps and winch and bucket

Result: 1.3

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d) Cleanliness of surroundings

The hypothesis was that clean surroundings indicate acceptance and a higher degree of behavioural change toward the use of the new supply point.

The sample: 30 villages where the supply surroundings were classified as clean in both 1984 and 1985;
30 villages where the supply surroundings were classified as dirty in 1984 and/or 1985.

Result: 0.61

e) Ethnic groups.

The hypothesis was that Muslim villages would more easily adapt their behaviour to the use of the new supply, partly because of their religious beliefs related to personal hygiene, and partly because of their more dense settlement patterns than other ethnic groups.

The sample: 41 Muslim villages
19 non-Muslim villages

Result: 3.01

f) Age of the new supply.

The age of the new supply would be related to adapted behaviour, assuming that more people would have changed their behaviour when the new supply had been functioning for several years.

The sample: 24 villages (new supply more than 5 years old)
36 villages (new supply less than 5 years old)

Result: 0.28

g) Number of visits by extension workers.

The hypothesis was that the more frequent the visits by such personnel, the more adapted would the villagers' behaviour be as to use of the new supply.

The sample: 34 villages (0-3 visits after handing-over ceremony)=few
24 villages (4-8 visits after handing-over ceremony)=many

Result: 0.52

Conclusions: It was found that distance to walk, as a single factor, was the only condition that was significant at a 95 per cent level, and that ethnic group identity (Muslim) was significant at the 90 per cent level.

7.2 Other resources planned and/or derived from the project for the local communities.

Time saved.

In almost 30 per cent of the villages all households save time in water collection from the new supply point - which according to oral estimate is between 30 minutes and 1 hour - not accounting for the possible increase in quantities used.

Roads.

About 13 per cent of the villages have constructed access roads.

Housing.

About five per cent of the villages have started to construct houses of bricks after the installation of new water supplies (brick-making demands much water). In about 80 per cent of the villages, houses built with bricks had already started, but the rate may well have accelerated after the installation of the new supplies. This information can not be read out of the available data.

The Workshop.

This was established to provide the necessary production and repair for the project hardware in-puts, and an estimated 85% of the capacity was used for this, whereas about 15 per cent was used to produce/repair items for private/statal customers at some profit. Each of the workshop employees was allowed to use the workshop on Saturday afternoons in order to produce items or income for himself. It is the aim of the planners that the percentages will be reversed, i.e. that production/repair for the project will approximate 15% and that the rest of the capacity will serve the region, nation and other development organisations on a profit-making basis. An assessment made of probable demand shows that this seems realistic. Main items for production will be: beds, stoves, chairs, tables, agricultural equipment, oil presses, wheelbarrows, donkey or ox-carts, winches and buckets and pumps. The repair work will focus mainly on: generators, vehicles, motorboats, pumps and equipment.

As mentioned above (6.) the workshops will be transferred to the employees, who are thereby given a unique possibility to run a profitable business venture.

The drilling teams.

If there should prove to be a demand for private wells or boreholes, the drilling teams might establish a business in providing these to customers who are willing to pay.

8. SUMMARY ON WOMEN'S INVOLVEMENT

Women are consulted on the siting of the new supplies.

Women are informed about the installation and function of the new supplies.

Women are being taught appropriate health and hygiene behaviour as related to water.

Women are providing free services to the project in the form of:

- cooking for the installation and social activation teams
- allocating housing facilities for these teams
- cleaning the surroundings of the new supply points

Women are beneficiaries of the new supplies which give improved quality and quantities of water, and which in about 30 per cent of the villages save time and energy for water collection.

Women's income generation has not been greatly enhanced by the project. Out of 133 Guineans employed on the project only five are female. The promotion of vegetable growing and provision of seeds aiming at improving nutrition and women's income generation has some rather negative results, according to a recent survey:

Vegetable cultivation	By Traditional source	By new source
4 Villages	No	Yes
26 "	No	No
13 "	Yes	Yes
17 "	Yes	No

Thus, there seems to be a relative decrease in vegetable growing as the new supplies are installed, although the data are on actual numbers and not on acreage. (It is likely other factors were involved as it is unlikely that the results of the project were negative in that aspect.)

There is no formal education or vocational training of women that will increase their chances of income generation or employment when the project phases out.

A survey performed by the project indicates that women will only be allowed by their communities to actively participate in project implementation when paid. The village operator (man) and caretaker of surroundings (woman) are unpaid, whereas the maintenance and repair mobile teams are salaried.

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Although it may be more difficult to introduce women as operators, maintenance and repair workers after several years of focusing on men for these tasks, there are renewed discussions on this point. The rationale for this is, of course, that the women have more vested interest in a smoothly functioning supply.

To the degree that time is saved for water collection, women might be able to produce more agricultural crops. Data from other water projects have shown that when the supplies are installed closer to homes, women's workload has not decreased because children then often stop helping their mothers. On the Quinara-Tombali project surveys were performed on who collects water in villages before implementation started and in the same villages after implementation of the new supply. The results were almost identical and showed:

57%	of all water collection is done by women
8%	" " is done by men
35%	" " is done by children (mostly girls)

To a survey question of what women would do with possible saved time, the answer most frequently given was to produce more palm oil.

The fact that women are the main handlers of water and users of the installations is not reflected in the roles and employment occupied by them on the project. On the aspects where project results are weaker, or more uncertain, than on the issues of function, it is mainly the decisions, behaviour and attitudes of women that will influence a more significant improvement in the health situation, through optimal use of the facilities.

CONCLUSION

The objectives of the Buba-Tombali drinking water project were to provide an adequate supply of safe water to 90% of the population in the two provinces. Quantity as well as quality should be sufficient throughout the year, and walking distance should be limited. The long-term objective was to improve the health situation and productivity of the target groups.

As per October 1986, 800 supplies have been installed. These are partly shallow wells with pump or bucket, partly hand-augered boreholes with pump or bucket.

The planning and cooperation between the Dutch Government and the Government of Guinea Bissau was rather avant-garde, considering that the project started in 1978:

- a. It was considered important that community women and men, as the users, were involved in the planning and implementation.
- b. The implementing technology has been kept on a low level, with the supply points being hand-dug and hand-augered wells and boreholes. This facilitated transfer of knowledge and reduced energy costs.
- c. Low cost technology of installations was chosen in order to facilitate operation and maintenance. A maintenance system was established from the start, and adjustments to technology and the maintenance system are taking place in order to reduce costs and increase effect.
- d. To find ways and means to transfer responsibility for the project to the government and users has been a conscious aim all along.
- e. Good record-keeping and regular assessments of function and use of supplies have been built into the project.
- f. Coverage of population per supply point is geared to the ecological and social situation in the project area.

Performed tests have shown that the quality of water in the new supplies is significantly better than in the traditional sources, in the majority of cases. A sample survey showed that the majority of the target villages increased the quantity of water used for household consumption with the new supplies. Surveys indicate that about 70 per cent of the target population use only the new supply for drinking water.

Assessments of the functioning of the supplies show that over 90 per cent give adequate quantities of safe water for a minimum of 10 months per year. At any given time a maximum of seven per cent of the installations are out of function for technical reasons.

/...

The fact that women are the main handlers of water and users of the installations is not reflected in their roles and employment opportunities on the project - especially when considering that this was a particularly sincere attempt at involving the local community women. There is concern amongst the planners and implementors that on those aspects where the project results are weaker than on the issues of function, it is mainly the decisions, behaviour and attitudes of women that will influence more significant improvements in the health situation, by:

- increasing the use of the new supplies for consumption purposes;
- avoiding re-pollution of the groundwater from dirty surroundings of the supply points;
- avoiding re-pollution of collected water during transport and storage;
- avoiding mosquito breeding and hook-worm infection from lack of drainage of spill-water;
- increasing quantities of water used to the recommended 25 litre/capita/day;
- increasing use of water for vegetable gardening to improve nutrition and income generation;
- improve personal hygiene on handwashing after defecation, before food-handling etc.

The assumption is that behavioural change in the desired directions will only take place with a more active and interested involvement by the community women. The project personnel is discussing two possible ways of obtaining this:

- a. SNV is employing a promoter for women's interests, who will look at possibilities of increasing women's education, employment and income generating activities in Guinea Bissau. It is likely that if in-puts to the women in the project area can be found, which will more directly correspond to their felt needs, a more active cooperation around development issues will follow. The water project estimates that in about 30 per cent of the villages, all households are saving some time in the collection of water. For women, a further reduction of time constraints and burdens is a high priority, according to project surveys and to a study made by Anne Marie Hochet for the Ministry of Planning and International Cooperation, Guinea Bissau¹.

Another report, according to internal evaluation, concluded that more day visits were required by project staff to effectively reach women at their working places. (It is likely that the short visits to assess the functioning of the supplies, might have had little value to sustain the development process).²

The project workshops for carpentry, electricity, metalwork production and repairshop are being taken over by the national project personnel to be run as a private/cooperative venture. This Company has the capacity to produce labour saving technology like mills, huskers, oil-presses, agricultural tools and implements, food-processors etc. Women's production groups for the provision of locally made soap and water containers are being discussed. Such groups might become self-sustained income generating ventures over time, and in the shorter term perspective they might become valuable promoters of water-related health and hygiene.

- b. The social activation section, which accounts for 10-17% of the water project budget, is looking for other means and ways to communicate with the local communities, and specifically with the women. During the field visit, it was fairly obvious that the community women were listening to the messages politely, but without much interest. It also seemed that the extension workers themselves were not very stimulated by the routine performance, and were eager to discuss possible alternative approaches.

In one case, while testing whether the women understood and could interpret a white and black photo, showing installation of a pump, communication took a different form, since they actively tried to provide in-put on the issue, and their interest was aroused. This indicates a possible direction that might be tried. Since optimal benefits from the water project still hinges on behavioural change by community women, which probably only will take place through continued communication and promotion by the social activation section, basic health workers and primary school teachers, it might be desirable to enhance this personnel's vast experience and dedication by exposing them to participatory training procedures. Much of their time is presently used to smoothen the functions of the installation team, and there are ongoing discussions on whether the social activation team should be upgraded, both as to numbers and as to educational skills.

A slide show is presently under preparation, to be used on health and hygiene education sessions in villages. This might create more interest in coming to meetings, but its value will ultimately depend on the degree to which it stimulates problem-identifying and problem-solving behaviour in the local communities.

1/ Research Study, Ministry of Planning and International Cooperation, Guinea Bissau, Document No. 6, by Anne Marie Hochet

2/ Rural Water Supply Development: The Buba-Tombali Water Project, Guinea Bissau, 1978-1981.

The project is going into Phase IV, 1987-89, during which period a third province, Bolama, will be included, and during which the transfer of responsibilities to Guinean nationals will be continued. At its maximum, the Dutch involvement counted 12 expatriates, but Guinean counterparts have gradually taken over responsibilities, making only five expatriates necessary from 1987 and for some time to come.

This process review has concentrated on the function and results of the project on the micro level. It deserves mention, however, that on a national scale it has provided valuable geohydrological data, it has strengthened the planning and policy making capacities of the Ministry of Natural Resources and Industry and it is a valuable model for future national planning in the rural water supply sector.

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