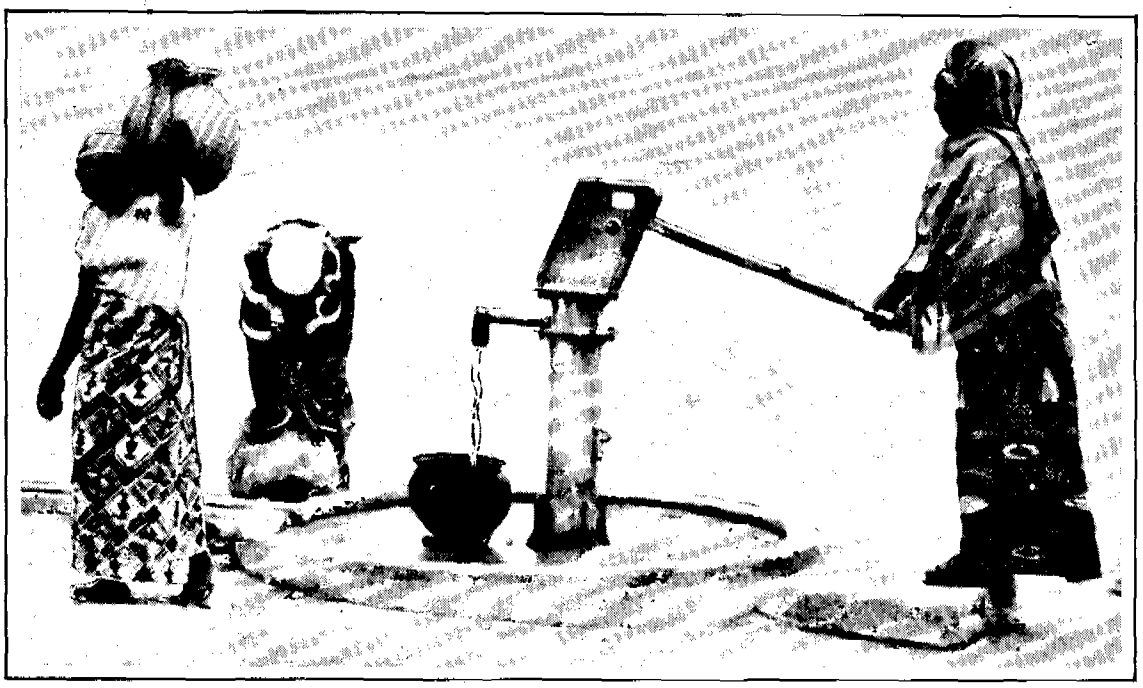
lib

UNITED NATIONS CHILDREN'S FUND



OUTLINE OF UNICEF-ASSISTED WATER AND SANITATION PROGRAMME IN NIGERIA

WATER AND SANITATION SECTION, UNICEF-LAGOS
FEBRUARY 1989

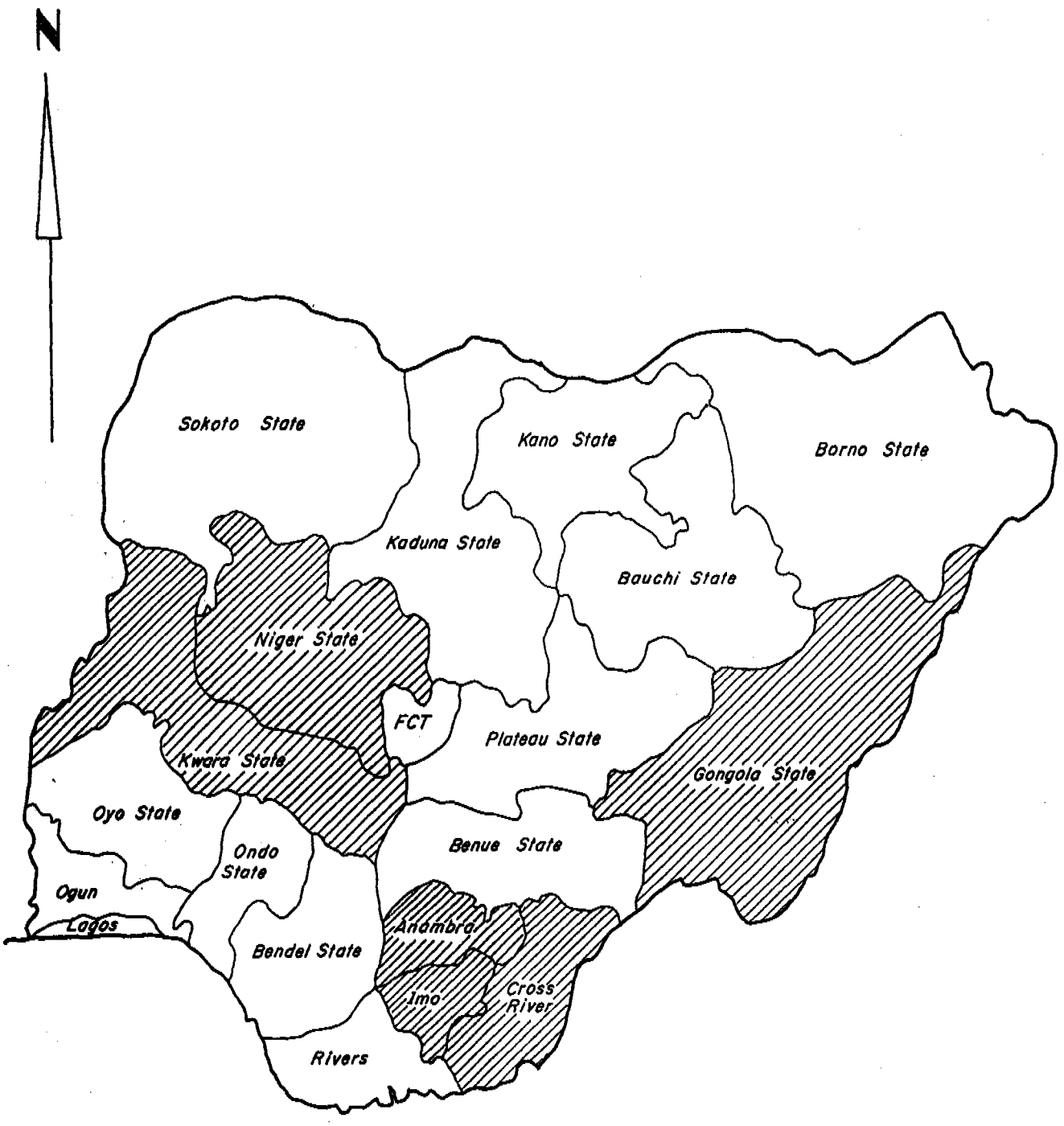
EXECUTIVE SUMMARY

This paper was used as a basis for a "Bridging Country Programme Proposal" for 1989 to 1991 to be presented at the April 1989 UNICEF Board Meeting. It provides in 12 pages an outline of the UNICEF assisted Water and Sanitation (WATSAN) Programme which supports 6 States of Nigeria.

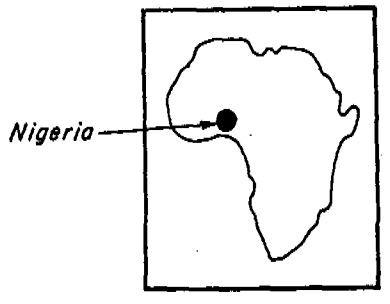
The aim of the document is to provide a summarized information on activities of UNICEF in the Rural Water and Sanitation Sector in Nigeria. The report gives an idea of funding, outputs, outcome and costs between 1981 and 1988, as well as the main objectives for the period of 1989 to 1991. Additionally it explains the multidisciplinary nature of the Programme, with its 6 major components, the institutional framework under which the State Projects operate, the implementation strategies followed and finally the question of monitoring and evaluation.

Carel de Rooy
Chief WATSAN Section - UNICEF, Lagos

Lagos, 9th February 1989



MAP OF AFRICA



UNICEF ASSISTED WATSAN PROJECTS IN NIGERIA

1988

UNITED NATIONS CHILDREN'S FUND
P. O. Box 1282
Lagos, Nigeria

DRAWN: *Olumide Beckleys*

DATE: *February 1989*

The Problem

Gastroenteritic diseases are the most important cause of child morbidity and mortality in Nigeria after malaria. It is estimated that the Nigerian child in a rural setting has as many as five bouts of diarrhoea per year. Recurring cholera epidemics account for a significant toll in human lives. Close to 1.5 million adults and children suffer every year from the debilitating and crippling effect of Guinea worm. These and other water-borne and excreta-related diseases are largely ascribed to the lack of water and the improper disposal of excreta, especially in the rural communities and the poorer urban areas.

Less than 50 per cent of Nigeria's population has access to potable water but perhaps more important in the fight against diarrhoea is the poor availability of water and the lack of adequate sanitation. The 60 per cent of the population who live in small rural communities use an average of less than 10 litres of water/capita/day. Collection of this meagre quantity, which is far below the WHO recommended daily minimum of 20 litres, frequently involves women and children in daily treks lasting several hours. This in turn incurs in lost opportunities for improved child care, school attendence and agricultural production, not to speak of the caloric wastage which can amount to 1,600 calories/woman/day.

A 1984 Master Plan for Rural Water Supply through mechanized borehole and reticulated schemes indicated that about US$ 25 billion (almost four times the present total annual revenues from oil) would be required to provide water to the estimated 55 million people then living in settlements of more than 20,000 people. Remote and small rural communities were excluded. The projected per capita cost of water, without sanitation or health education was US$ 455.

If the rural population does not adopt a simple low-cost system for water supply and excreta disposal, then the pathetic status of women and children, the most disadvantaged and vulnerable group within the rural communities will continue to persist.

The challenge therefore is to demonstrate the feasibility of low cost, easily replicable and maintainable schemes of water supply integrated with transfer of excreta disposal technology and health education to improve basic health hygiene practices amongst mothers and children in rural areas. The ultimate objective being the adoption of such schemes by the Federal and State Governments with support from multilateral and bilateral agencies to reduce children and women's morbidity and mortality rates.

On-Going Projects

In an attempt to demonstrate the feasibilty and potential health benefits of low cost approaches, UNICEF pioneered the Imo State WATSAN Pilot Project in 1981. By December 1988 the WATSAN Programme had expanded to 5 additional States and completed 1,997 handpump equipped boreholes, 3,828 Ventilated Improved Pit (VIP) latrine compartments and trained 9,500 Village Based Workers (VBWs).

The notable success and public visibility of the Imo Project, based on water as an entry point for a multi-faceted programme that included health education, sanitation, mobilization and community ownership, led the governments of Gongola and Kwara States as early as 1984 to embark on similar multi-component projects. UNICEF assistance to these States was modest compared to the level required to initiate the Imo Pilot Project. In Imo approximately 80 percent of all inputs were initially contributed by UNICEF in view of the necessary research and development required to enable the creation of a model which could be replicated with some adaptations to the rest of the Country.

By 1986, the Federal Government of Nigeria, through its Directorate for Food, Roads and Rural Infrastructures (DFRRI) had adopted the model for its Rural Water Supply and Sanitation Programme (RUWATSAN). DFRRI hoped that the approach would increase its coverage while reducing costs.

Cross River, Niger and Anambra States followed the "UNICEF WATSAN Model" in 1986, 1987 and 1988 respectively with ever reducing UNICEF inputs. Anambra was actually the first State to pay for most of the required capital inputs itself on a reimbursable basis.

Additionally to the "WATSAN Programme", presently operational in 6 States, UNICEF has been assisting the Federal Ministry of Health (FMOH) with the running of its Rural Clinic Water and Sanitation Project since 1984. This Project's aim was initially to provide handpump equipped boreholes to rural clinics so as to improve their infrastructure. This in turn would strengthen the delivery of PHC services to the rural population.

To date, 205 clinics have been reached by the project in 8 States, hereby enabling their full contribution as Static centres to the EPI and ORT programmes as well as PHC in general. The Project is currently entirely funded by the FMOH.

Past Performance

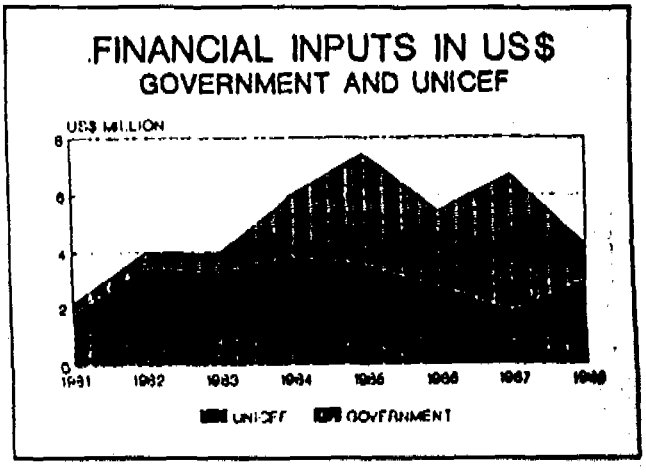
Table 1: Chronology of UNICEF Intervention in WATSAN (1981-1988)

State	1981	1982	1983	1984	1985	1986	1987	1988
Imo	———	———	———	———	———	———	———	———
Gongola				———	———	———	———	———
Kwara				———	———	———	———	———
Cross River						———	———	———
Niger							———	———
Anambra								—

Financial Inputs

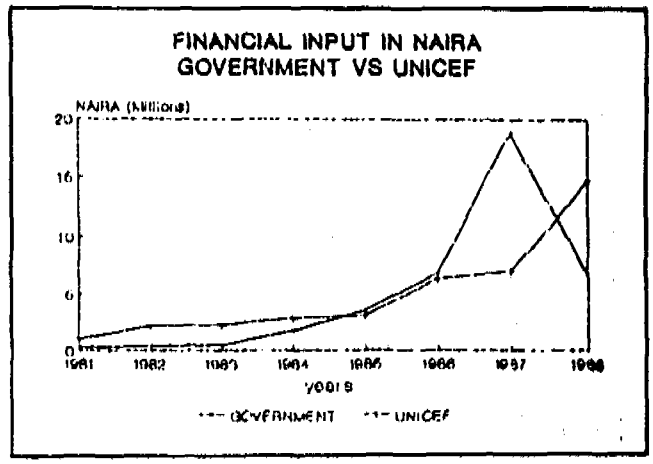
Government inputs over the period of 1981 to 1988 amount to US$17.0 Million, which represent 43.9 percent of the total (US$38.75).

The absolute value of Government inputs in both Naira and US$ have however sharply declined over the past year because in 1987 Naira 3 million were contributed by Anambra for capital investments, but also due to serious cashflow problems at several

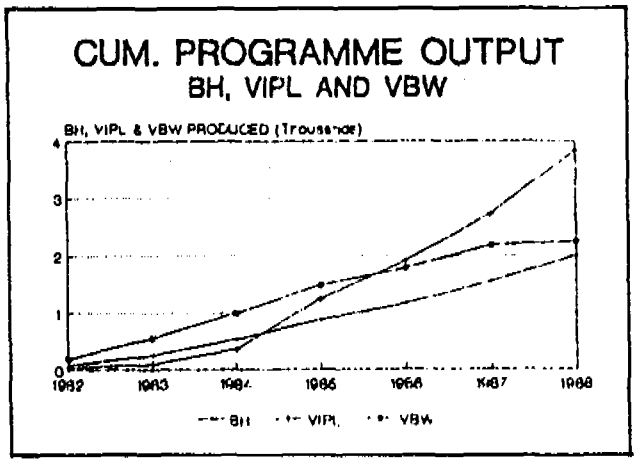


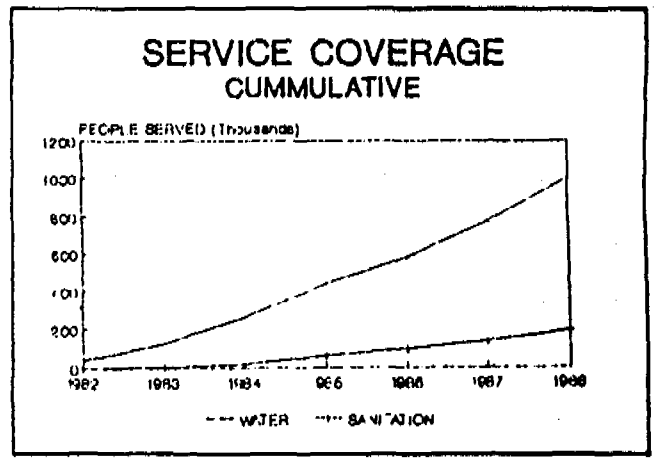
projects during 1988. As a result UNICEF has had to increase its inputs to cope with importation of offshore requirements particularly handpumps and accessories.

It must be noted additionally that the urgent need to replace aging vehicles and equipment has become all but impossible with the devaluation of the Naira and UNICEF's limited capacity to fund this rapidly expanding Programme.



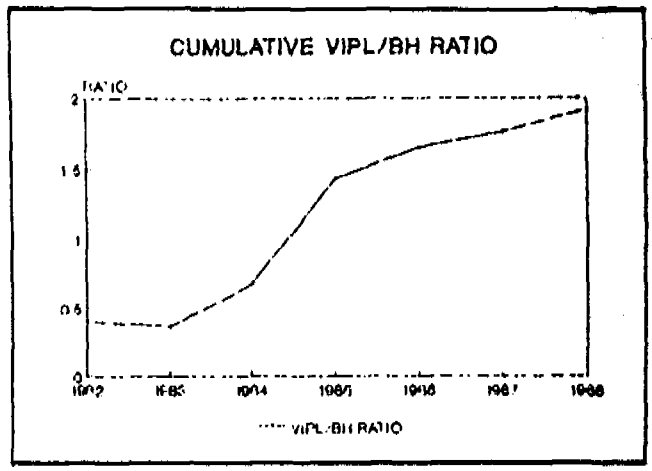
Quantifiable Outputs and Coverage





By December 1988 1,997 handpump equipped boreholes, and 3,882 VIP latrine compartments had been built. The proliferation of excreta disposal technology has a "long gestation period" but is gradually accelerating as measures by the cumulative VIP Latrine/BH ratio which has increased from 0.4 to 1.9 (1982 - 1988). Sanitation coverage however is still only 20% of that for water supply which indicates that greater efforts have to be made to narrow this gap.

In addition to the training of 9,500 Village Based Workers to date, other strategies for improving of health/hygiene practices are being used. These include working through school children, formal health workers and the establishment of mothers clubs. The latter has been very successful also as a means to improve income generation and literacy.



Outcome & Impact

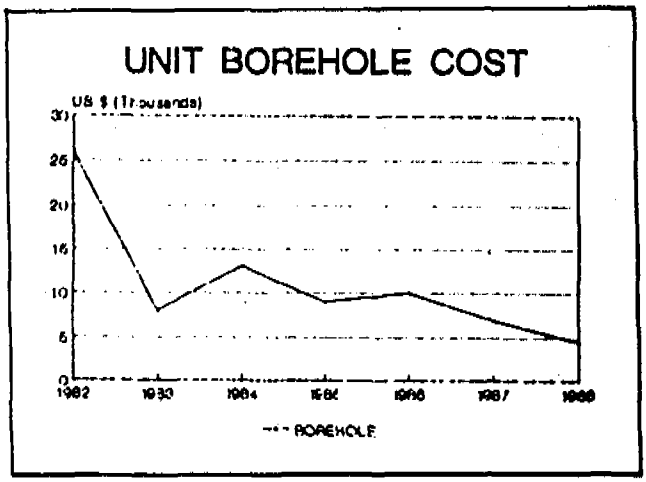
The most significant outcome of the Programme has been the acceptance at Federal level and its tentative replication at national level by the Directorate for Food, Roads and Rural Infrastructures (DFRRI). Although several problems surfaced during the implementation of the latter, the political will to adopt low cost approaches should not be underestimated.

Various evaluation studies have indicated a positive health and socio-economic impact resulting from the Programme interventions. Specifically for areas where the prevalence of Guinea worm is high, the impact has been drastic with school attendence increasing abruptly, agricultural output doubling or tripling in a few years, and household income as well as wellfare improving. It is particularly interesting to note that immunization coverage is also larger in such areas as compared to those were Guinea worm prevalence is still high.

The support to the private sector for substituting of imported materials is starting to yield results. Drilling rig and vehicle manufacturers are supplying spareparts in local currency and may soon sell equipment and transport likewise. PVC casing and riser mains are being produced locally and and Nigerian made handpumps have also started to appear on the market.

Costs

Relatively speaking, the UNICEF WATSAN approach has been cost effective as it presently stands at US$14/capita. This is expected to continue falling (from an initial US$85/capita in 1982) because of increased output due to the use of locally produced low-cost manually driven rigs. The devaluation of the Naira will also reduce labour costs and the cost of locally procured items which are rapidly substituting imported products. World Bank-Assisted Agricultural Development Projects have a per capita cost in the order of US$25-30 but do not include Sanitation and Health Education components.



Unit cost of boreholes has dropped from US$ 21,000 to US$ 4,500 from 1982 to 1988 and is expected to reach US$ 2,500 by 1991.

Objectives of the Plan of Operations (PLANOPS) 1989 - 1991

The basis of the 1989 - 1991 WATSAN PLANOPS are the recommendations deriving from the Mid-Term Review (1986 - 1990) which took place in June 1988.

Goal

Consolidate the "UNICEF WATSAN Model" in 6 States to highlight it as a low cost and feasible alternative for reducing child and women's morbidity and mortality rates caused by water borne and excreta related diseases in rural areas of Nigeria.

Objectives

1. To accelerate the proliferation of private (household) VIP latrines. The total VIP/BH ratio should reach 5/1 by 1991 ending.

2. To strengthen the Community Mobilization and Health Education components by using alternative strategies to the VBW. The ultimate aim being the reduction of FCC in household water samples by 80 percent from pre-intervention levels.

3. Intensify efforts in training and capacitation of the local human resource base to consolidate the gains achieved by the Programme to date.

4. Increase production of boreholes to 200/State/year and reduce the average cost of boreholes to US$ 2,500/unit by 1991.

5. Document and computerise all inputs and outputs as well as unit costs for each Project and the Programme as a whole.

6. Strengthen the role of the private sector in after sales service and local production of borehole production and handpump installation materials including handpumps. By 1991 UNICEF should only be importing on behalf of, or for the WATSAN Projects; new vehicles, equipment (no spareparts) and connecting rods for handpumps.

7. Support the National Task Force on Guinea Worm eradication and reduce the incidence of the disease to less than 3 percent in all intervention areas.

8. Support DFRRI and MAMSER Programmes to facilitate large scale replication of UNICEF's assistance.

9. Liaise with potential ESA's and local authorities to increase funding of the "UNICEF WATSAN approach" in Nigeria.

10. Involve women in WATSAN through establishment of Mothers' Clubs in all intervention LGAs for promotion of health education, increased food production on communal farms, and income generation activities.

Programme Activities

The Water and Sanitation Projects conduct a cluster of interacting activities:

a) planning, monitoring and evaluation
b) community mobilization, health education and project support communication
c) sanitation (proliferation of excreta disposal technology)
d) water supply, and
e) workshop and store
f) administration and finance

Activities a, e and f are supportive to b, c and d which are the main thrust of the WATSAN Programme in terms of service delivery to rural populations.

Planning, Monitoring and Evaluation: Prior to intervention, the Projects conduct baseline surveys in intervention areas to determine the basic KAPs of the communities to be reached. This information is used to plan community mobilisation, strategies for health education, types of VIP latrines to be introduced, willingness of communities to support and contribute to the Projects efforts etc. Monthly, predetermined quantifiable parameters (see Monitoring and Evaluation) are monitored and documented, and after some period of successful operation of schemes, evaluation studies are conducted in selected intervention areas .

Water quality control is an ongoing monitoring activity which intervenes at various stages. At the completion of drilling before the compressor is turned off, the drilling team collects a sample for chemical and bacteriological analysis by the microbiologist in the laboratory attached to the Planning, Monitoring and Evaluation Unit. If the water is inadequate chemically (which rarely happens), no platform is constructed and the borehole is abandoned.

Bacteriological contamination which takes place during the drilling or handpump installation operations is treated by a one time on site chlorination. Immediately after handpump installation, another water sample is collected to ascertain good water quality, specifically bacterial content. Thereafter, the microbiologist collects samples from every borehole at six monthly to annual intervals for analysis.

Community Mobilization, Health Education & Project Support Communication: There is need to create, in each beneficiary community or village, awareness and a sense of ownership, and to elicit the active support and participation of the local people. In this way the gains and inputs brought by the project will be taken care of and maintained. The task of systemising this aspect of project implementation is the function of the mobilization team, which is made up mainly of State community development, public information, and health education staff.

The mobilization team makes the first contact with the community. They inform the people of the project, and mobilize them into being active participants in the implementation of the project by working through the existing leaders and institutions of the community. Thus, the team members first contact the community leader and his council of chiefs to work out an agreement that includes the provision of materials for handpump platform construction, labour for bush clearing, the selection of men and women to be trained as VBWs and a future commitment to sustain the project by means of modest taxation. Mobilization is an on-going process and so the team should return from time to time to reinforce the basic project messages.

One of the main outputs of the project is improved community health education, which has in the past been achieved "to some extent" through Project trained village based workers (VBWs). The VBWs carry the messages of the project to the homes, and, since they live in the community, can through their own actions win converts in improved water use and personal health and hygiene habits. Ideally they should be functionally literate and permanently established in the community.

The health education team has the task of training and motivating the village based workers. VBWs are trained in their village settings using hands-on and discussion approaches with a minimum of lectures. The VBWs are introduced to basics of improved water collection, transportation (from the handpump), storage and use including ORT through SSS. Additionally messages on improved excreta disposal and Guinea worm eradication are also provided. Integration with other UNICEF assisted Programmes is at this point undertaken by adding concepts on child nutrition, food hygiene, breastfeeding and major local MCH related diseases (e.g. malaria, tetanus etc.), as well as the importance of immunization. Much of the training message is given through role-playing, dramas, and songs.

A substantial drop out of VBWs due to the lack financial and institutional support has forced projects to strengthen the VBW approach and look at alternative channels to conduct health education. The former includes supporting the intensification of feedback, visits and discussions; establishment of VBW associations, assisting with communal agricultural projects and giving out prizes for good performance. The latter consist of health clinics, schools, radio and establishment of mothers clubs.

The use of posters carrying health focussed messages are a means to support VBWs, school teachers and health workers to conduct their sharing of knowledge at community level, as well as remind villagers of the improved health/hygiene practices being advocated by the Project. This communication strategy is backed by radio jingles. For policy makers at the Federal and State levels television proves to be an efficient channel to draw attention and political support to the WATSAN Projects.

Sanitation: Clean drinking water alone, without proper sanitation, will not achieve the result of reducing water-related morbidity and mortality in rural areas. Hence, it is not only necessary to combine the intervention with new sanitation messages, but to offer a technical alternative means of human waste disposal to the communities.

The sanitation technology selected for the programme is the ventilated improved pit (VIP) latrine. This latrine is the result of extensive research worldwide and particularly in Africa. When constructed correctly, it is free of odour and flies, clean and durable. Construction costs, which are borne by the community or individual, are relatively low and affordable. Semi-permanent single pit or permanent alternating pit models are promoted for household use. Multi-compartment alternating pit latrines have proved to be highly successful as public latrines, mostly in institutions and markets.

UNICEF's assistance to States in the area of sanitation remains one of creating and strengthening the institutional capacities in these States to plan, fund and implement low-cost sanitation programmes based on the VIP latrine.

At the State and LGA levels, the sanitation teams are composed of building technicians, health educators, community development officers and artisans. The LGA teams interact with Project trained, village-based artisans in the community. The principal functions of the state teams are:

- to coordinate and develop sanitation activities throughout the state;
- to assist LGAs to establish and train sanitation teams during the construction of demonstration latrines;
- to assist LGA sanitation teams in training community-level artisans and latrine builders through the construction of demonstration latrines;
- to undertake R&D to improve the affordability of the VIP latrine;
- to establish, jointly with LGA sanitation teams, slab construction units for provision of latrine slabs to individuals willing to construct VIP latrines in their households.

Water Supply: The water supply component has the following activities:

- geophysical investigations
- drilling
- borehole development
- platform construction
- well testing

The objective is to provide water to communities with less than 5,000 population using a system which can be maintained at the village level. The community is invited to participate in the choice of the borehole site whenever hydrogeological conditions allow for the selection of alternative sites, which is usually the case.

The design borehole/population ratio used is 1/500. This is not ideal but experience has proven that it is politically unacceptable at this stage to attempt a higher ratio (1/250) because an acceptable balance has to be found between health impact and equitable distribution.

The water supply team is also encouraged to undertake mobilization sessions during the borehole construction, showing the importance of VIP latrine construction and use, the need to upgrade environmental sanitation, particularly around the handpump, and how to improve water collection, transport, storage, use and consumption with the aim of attaining better health.

The first activity is the identification of adequate sites to drill boreholes, which is undertaken by means of geophysical investigations. In sedimentary rock formations, the resistivity method is used, while on basement rocks the electro-magnetic or VLF methods are employed. After several potential sites have been located and the final choice is determined with participation of villagers, the drilling crew move in. This always occurs after the activities of the mobilization and health education teams.

Drilling takes place with versatile equipment which can undertake rotary (mud) drilling on unconsolidated materials or percussion (hammer) drilling on hard rocks. Borehole depths average 50 meters while minimum drilling diameters are 4.5 inches. The casing of boreholes is undertaken, when necessary, with 4-inch PVC casing and screens, using high-quality rise size gravel. After completion of the borehole, the drilling team undertakes partial development using the compressor, and thereafter, the borehole-development team comes in to complete the process, by means of submersible pumps run by generators.

A separate platform construction team will then follow to build a concrete pedestal that permanently covers the borehole, anchoring the legs and base of the handpump in two feet of concrete; the platform is keyhole-shaped, some two meters in diameter where it surrounds the pump, and 5-6 meters in length. Most of its length accommodates a runoff drain which leads to a soak-away or a small irrigated plot for fruit trees or vegetables normally allocated to the VBW.

Well testing is not undertaken for every borehole, selected sites are however tested to obtain an indication of the average well output potential for different aquifers.

Locally manufactured manually operated drilling rigs suited for unconsolidated sedimentary formations, as well as spring development and upgrading of handdug wells are technologies being used to accelerate coverage and reduce per capita cost of water supply. The use of solar powered pumping will also be considered as it is more cost effective than handpumps for communities with populations above 2,000.

Workshop & Stores: The Project Base established for maintenance work of the Project plays an important backup role for other UNICEF assisted Programme components such as EPI and ORT, where vehicles and other equipment need to be maintained.

All Project vehicles and equipment, valued usually between US$ 1 and 2 million are regularly maintained at the Project workshop. Supplies are also stored there with records being kept through the "cardex system". The latter is linked with a D-Base Plus computer programme based in Lagos through issue and receipt vouchers.

The handpump installation and maintenance team is also kept under this unit so as to enhance preventative maintenance particularly at LGA level, as well as gradually assisting LGAs to pass all maintenance responsibilities to the communities through VLOM. It normally arrives at a drilled borehole to install a handpump a week or 10 days after the concrete platform has gained adequate strength. The team is accompanied by their LGA counterparts who are trained on the job.

Administration and Finance: Besides ensuring the non-interruption of cashflow by liaising with the proper Government authorities, this unit also takes care of all personnel issues and assists in compiling financial data for costing.

Institutional Framework and Implementation Strategy

The first phase of implementation in a State consists of training. This is the most intensive period of UNICEF assistance taking from 18 to 24 months and involves essentially on-the-job training.

After the initial phase, UNICEF assistance reduces to a level of support commensurate with the ability of the State staff to run the project. By the end of the third year UNICEF staff are withdrawn from the State, but periodical visits by UNICEF officials persist.

The State Government is entirely responsible for managing the Project since its inception through its Project Manager. UNICEF's presence is limited to advising, monitoring and evaluating.

The strength of the WATSAN Model is its community base. Most project activities are undertaken at the community and village levels, receiving support from the two tiers of government, the State and the LGA. The structure within which the project is implemented is therefore a simple one, starting at the top with the State Steering Committee and State Project staff, down through LGA supporting departments (Health and Works), to the implementation of the project in the villages. It is recognized that there are considerable improvements to be made, particularly in the fields of health education and sanitation.

Coordinating Body: Memoranda of Understanding have been signed with all State Governors. The 6 WATSAN projects are thus formally situated at the State Governor's Office. The reason for this is that past experience has indicated that it was very difficult to run multi-disciplinary Projects from a ministery. Frequently the required human resources to be seconded from other ministeries, or funding were not made available.

From the State Cabinet Office it is much easier to coordinate and integrate the inputs of the various ministries. The coordinating ministry or office in a State provides housing for the technical experts posted by UNICEF, as well as the Project Office and Workshop & Store. Sometimes these structures are all combined in what is then denominated "Project Base".

State Steering Committee: This is a committee of representatives from the six or seven state level ministries which normally participate in the project - - Health, Local Government, Information, Education, Public Utilities, Works and Economic Development - - as well as the River Basin Authority and the University. The State Steering Committee is the policy-making body that issues guidelines for the implementation of the project in the State.

LGA-Level Operation: The next tier in the project framework is the Local Government Area. The LGA administration provides housing for project staff working in the area, and seconds staff, usually from the Works and Health Departments. These project staff at the LGA-level train and assist LGA/Project trained handpump caretakers in the maintenance of handpumps, and, in the form of LGA sanitation teams, promote the use of VIP latrines, train village-based artisans and assist communities and individuals with latrine construction. In addition, the Local Government is responsible for implementing a revenue generating system by means of modest water use taxes to sustain handpump maintenance, VIP latrine construction and health education.

Community-Level Activities: The project is implemented at the community level within the traditional structures and leadership the chief with his council of smaller chiefs working through project-created Village Steering Committees. All these work together with project staff and VBWs to implement and sustain the project in their community.

With the implementation of VLOM, it is expected that a self imposed taxation will be implemented to finance handpump maintenance undertaken by village based caretakers.

Implementation Sequence

Table 2 presents the typical chronology of events during intervention of the Project into a District or LGA.

Table 2: Implementation Sequence

MONTHS	1	2	3	4	5	6	7	8	9	10
Planning, Monitoring & Ev.	———	—	—	—	—	—	—	—	—	—
C. Mob., H. Educ. & PSC		———	———	———	—	—	—	—	—	—
Sanitation				———	———	———	———	———	———	———
Water Supply						———	———	———	———	———

After water supply has been completed and the Project moves on to another area, all the components continue supporting the LGA/District with monthly visits to monitor progress. In depth evaluations may take place one or two years after intervention.

Integration with Oral Rehydration Therapy (ORT) and the Expanded Programme of Immunization (EPI): The infrastructure developed for the Water and Sanitation Project is shared with other primary health care projects. Aspects of the integrated approach are:

- a shared project office and workshop resulting in information sharing and improved vehicle maintenance;
- enhanced training of VBWs in ORT and the benefits of immunization;
- the provision of handpumps and VIP latrines at Health Clinics.

Monitoring and Evaluation

The ultimate objective of the Water and Sanitation Programme is to achieve a reduced incidence of water-borne and excreta-related diseases in the intervention areas, especially amongst children and mothers. Reduced morbidity and mortality due to diarrhoeal diseases is the benchmark against which the impact of the programme should be gauged. Given the complexity, however, of establishing casual relationships between specific water supply and sanitation interventions and such impact indicators, the focus of monitoring will be on process indicators that measure progress, shortfalls and solid gains.

The existing system of project surveillance has the following components:

a) Pre-intervention baseline surveys undertaken with standard questionaires which inform on water supply, sanitation and knowledge, attitudes and practices (KAPs) in general.

b) Performance indicators computed on a monthly basis.

Water Supply:
- number of successful boreholes drilled
- number of abortive boreholes drilled
- cumulative percentage of successful boreholes drilled
- number of handpumps installed
- number of handpumps operational
- percentage of handpumps operational
- number of handpumps serviced
- number of handpumps repaired
- number of handpump caretakers trained

Sanitation:
- number of Project funded demonstration VIP latrine compartments
- number of private or community funded VIP latrine compartments
- private VIP latrine compartments/Project funded VIP latrine comptartments
- number of VIP latrine slabs constructed
- number of VIP latrine slabs sold
- revenue with VIP latrine slabs sold
- number of VIP latrine artisans trained

Health Education/Community Mobilization:
- number of VBWs trained

Other parameters are monitored on a quarterly basis:

- average Feacal Coliform Count (FCC) in household water samples

Additionally the Projects undertake quarterly evaluations, using a locally developed system which allows the quantification of the adequateness of knowledge transfer to the communities on ORT, EPI, Sanitation, Guinea Worm eradication, improved water collection, transportation and storage in the households.

Finally, occasional evaluations are made in selected areas to assess the health and socio-economic impact of the Project interventions.