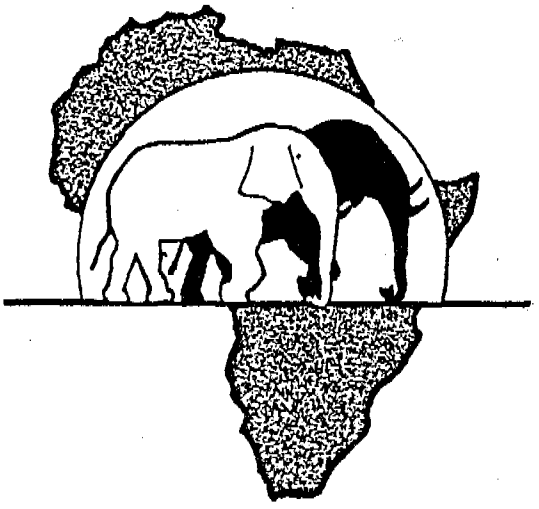

MOLE 2

RURAL WATER IN THE CONTEXT OF CHILD SURVIVAL

CONFERENCE REPORT
MARCH 1990

IN SUPPORT OF
GHANA WATER AND SEWERAGE CORPORATION
RURAL WATER DIVISION'S DEVELOPMENT PROGRAMME 1990

CONFERENCE ON
RURAL WATER IN THE CONTEXT OF CHILD SURVIVAL

CONFERENCE REPORT
MARCH 1990

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• Acknowledgements

No conference report is complete without an acknowledgement of the many individuals and groups who contributed towards making the event possible.

Thanks must go to the following people:

- The PNDC Northern Regional Secretary, Mr John Bawa, for opening MOLE II.
- Dr Tinorgah and Ron Bannerman for agreeing to act as chairpersons. The speakers: Professor Ashitey, Clement Kwei, Dr Tinorgah, Ato Brown, Mrs Bawa, Simon Aaneyh, Ross Kidd, Mr de Graft Adjei and Professor Amonoo for their enlightening contributions.
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- Kate O'Malley for writing this report. Jan Davies, Hans Vos and Joshua Arthur for providing additional information.

But most of all thanks are due to the conference participants. Their energy and commitment ensured the success of the event. And of course we must not forget the Mole elephants for their strategic appearances which mean that Mole conferences are something out of the ordinary.

Peter Kpordugbe
NSS director for
conference organizers

Glossary of Abbreviations

ADRA	Adventist Development and Relief Agency
CIDA	Canadian International Development Agency
CDR	Committee for the Defence of the Revolution
CDS	Centre for Development Studies (University of Cape Coast)
CRS	Catholic Relief Services
CWO	Community water organizer
DCD	Department of Community Development
DHMT	District Health Management Team
DS	District Secretary
GES	Ghana Education Service
GNCC	Ghana National Commission on Children
GWSC	Ghana Water and Sewerage Corporation
ISODEC	Integrated Social Development Centre
MFEP	Ministry of Finance and Economic Planning
MOH	Ministry of Health
NGO	Non-Governmental Organization
NORRIP	Northern Region Rural Integrated Programme
NSS	National Service Secretariat
PAMSCAD	Programme of Actions to Mitigate the Social Cost of Adjustment
PHC	Primary Health Care
TNC	Training Network Centre (University of Science and Technology)
UNDP	United Nations Development Program
UNICEF	United Nations Children's Education Fund
UST	University of Science and Technology
VLOM	Village Level Operation and Maintenance
VSO	Voluntary Service Overseas
WHO	World Health Organization
WRRI	Water Resources Research Institute
WUP(WEFH)	Water Utilization Project (Water Education for Health)

List of Participants

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Amasachina	Fuseini Iddrisu
CDR	Moses Addai Kwadwo Owusu
CDS	Kojo Mbir
CRS	Hippolyt Pul
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DCD	Paul Alimbey Joshua Arthur Paul Avorkah
District Secretary, Adansi	Mr de Graft Adjei
District Secretary, Damango	
GES	Mrs Bawa
GWSC	Ernest Doe Clement Kwei
GNCC	S. S. Nayina Eric Appiah Okrah
ISODEC	Judith Thompson
Kumasi Sanitation Project	Ato Brown
NORRIP	Donald Amuah Sule Gariba Dr A. Tinorgah
NSS	Holly Evans Boniface A. Gambilla Steve Gear Peter Kpordugbe Douglas Adjei Kwame Gifty Mahama Kate O'Malley Nana Ekua Sangmuah
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OXFAM	Jan Davies
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UNICEF	Dr M. M. George
VSO	Tony Dogbe
Village Water Reservoirs	Fati Mumuni Hans Vos
WRRI	Dr Amuzu Daniel Frimpong
WUP	Simon Aaneyh Ian Ellis Ross Kidd

WaterAid	Ron Bannerman Angela Odonkor Lindesay Robertson
World Bank	Erich Baumann
World Vision	Harry Reynolds

• Introduction

The case for extending the provision of safe drinking water to all corners of rural Ghana is clear cut. Seventy per cent of the population live in rural areas yet only 40 per cent have access to potable water. This 70 per cent, ill served by provisions of central government, provide most of the economy's productive labour. The sight of whole communities prevented from productive labour because they have taken in the crippling guinea worm in their water is enough to convince anyone that the need for safe water is urgent.

For children the provision of decent water is a question of survival. Dehydration through diarrhoea is one of the major killers of infants in Ghana, contributing largely to a dismal infant mortality rate of 150 in 1,000 births. Bad.water, while not the only cause of diarrhoea, is a common carrier of the disease.

But 52 individuals representing a broad range of government agencies, NGOs, bilateral and multilateral agencies did not come to MOLE 2 to be convinced of the centrality of water to rural improvement. They came instead to look at how - how to co-ordinate their efforts better, how to make safe drinking water for all a reality, not a slogan.

This year's MOLE conference differed from the first one in that it concentrated not on the technical provision of water services, but on what has become known as "software" or human resource mobilization. One of the major principles agreed upon was that water is not simply a technical interaction. It is inextricably linked with health education, community participation and sanitation.

Like the horse that can be dragged to water but can refuse to drink, communities can be provided with wells but blithely continue drinking the familiar tasting polluted surface water unless they have decided that they want a well. The days of labelling communities as "defaulters" or "reluctant" recipients are over. Planning is beginning to start from the people's needs not the wishes of donor agencies.

The only way the goal of village level operation and maintenance of a structure can be achieved is if the community takes on board the project as its own. Community control is probably a more appropriate phrase than community participation.

A major group whose needs have often only been paid lip service to is women. The conference recognized that as women are the primary household managers of water, any project will fail without their participation. Strategies must be developed to build up women's confidence and break down the barriers to women's involvement in decision making. It may not be a comfortable process for men, but it is a process that is necessary if human liberation is the true goal of rural development.

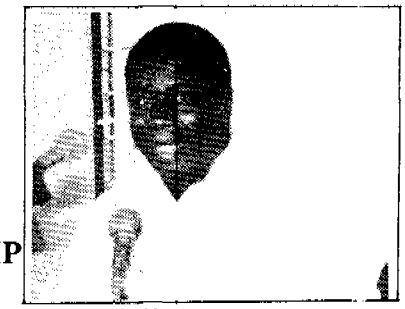
MOLE 2 sought to chew over these issues and come up with some practical measures. The recommendations are not a blueprint for success but they are a step on the road towards a strategy to develop the rural water sector.

MOLE Conference

• Day One

Friday 9, March

Chairperson: Dr Tinorgah, NORRIP



Mr. John Bawa
Secretary for the Northern Region

OPENING CEREMONY

Dr Tinorgah welcomed everyone and said he was pleased to see a lot of non-technical people present. He reminded participants of the theme - Rural Water in the Context of Child Survival. Bad water has adverse effects on the poor, rural dwellers, urban slum inhabitants, women and children, he said. Children are represented in all those categories.

Mr John Bawa, PNDC Northern Regional Secretary, officially opened the conference on behalf of Nana Konadu Rawlings, president of the 31st December Women's Movement, who apologised for not being able to attend. Good water is a basic need that has eluded us for too long, Mr Bawa said. A lot of diseases stem from use of bad water, therefore, solving the water problem will cut away a large chunk of rural dwellers' problems.

Mr Bawa expressed approval for the theme. As he drove to Mole Game Park at 9:30 am, he saw women on the road carrying tins of water. He believed they had been out looking for this water since 2 or 3 am.

He hoped something concrete would emerge from the conference to help rural communities.

KEYNOTE ADDRESS

Summary of an Address by Professor Ashitey, Head of Department of Community Health, University of Ghana Medical School.

Prof. Ashitey

We are living in exciting times, times of change, challenge and opportunities. We have been engaged in a health revolution since 1978. In 1977, WHO decided the goal for the rest of the century should be a level of health to enable all individuals to live a productive life. In 1978, 150 governments meeting at Alma Ata, USSR, chose primary health care (PHC) as a strategy for achieving health for all by the year 2000. A short definition is: essential health care which is appropriate, acceptable, accessible and affordable for communities and which involves their full participation.

It was obvious at Alma Ata that PHC would take different forms in different countries. However, eight essential components can be identified:

- health education
- food and nutrition

- water and basic sanitation
- maternal and child health programmes (including family planning)
- control of endemic diseases
- immunization
- treatment of common diseases
- supply of essential drugs.

PHC embodies four central tenets:

- health is a fundamental human right.
- health is made or broken where people live and work.
- local people are the best agents for health development.
- health is a tool as well as a product of socio economic development.

A year before the Alma Ata meeting, Ghana's PHC policy was ready. It sought to address questions of equity and social justice in health. The chief causes of child mortality in Ghana are malaria, diarrhoea, measles, malnutrition and pneumonia. Many of these are caused by unsafe water.

Estimates of relevant statistics are:

- 70 per cent of Ghanaians live in rural areas compared to 30 per cent in urban areas.
- 40 per cent of rural people have access to potable water, compared to 90 per cent of urban residents.
- The infant mortality rate for rural communities is about 150:1,000. For urban children it is 80:1,000.

The infant mortality rate is one of the basic indicators of health. Most infant deaths are due to poor environmental conditions, lack of potable water and diseases which can be prevented by vaccination.

The other day somebody commented that the 70 per cent who live in rural areas produce 75 per cent of Ghana's wealth but they only consume 25 per cent of the country's social amenities. PHC aims to correct this disparity.

Water occupies a priority position in PHC strategies. It must be provided in sufficient quantities. It must be accessible, acceptable and affordable. Ten years ago a professor estimated pipe borne water would wipe out 75 per cent of diseases that plague us. The cost of potable water can be expensive but it is not much when compared to the increase in dignity and productivity which it brings.

In my opinion, despite many debts and against many odds, much has happened in Ghana since 1979. Ordinary people are taking health into their own hands with or without doctors. Throughout the country people are building KVIPs, taking part in immunization campaigns and improving their water sources. People are on the move. People are weaning themselves off benevolent and distant government. It has not been easy. The early 80s were traumatic times. Natural disasters coincided with the collapse of the economy and an exodus of trained manpower. We have learnt our lessons. We are now poised to back the health revolution. Many districts already have district health management teams (DHMTs) to support PHC. The momentum has to be kept going. It would be a great tragedy if we were to fumble and let the opportunity slip.

The basis of my optimism is that the time is ripe. People are now wanting to work together. Ghanaian institutions have never been known for collaboration. It used to be a competition. Now we meet at conferences to formulate strategies together. It breaks my heart how simple people have been confused by the conflicting demands of different organizations. These agencies claim to be helping the very people they confuse and confound. Organizations are learning that this is wrong, and that is progress.

There has been a subtle change in the life of Ghanaians. I marvel at the number of transistor radios and TV sets in communities. Ghanaians are no longer in isolated settlements. They can be reached easily by radio. It is a channel of communication that can bring new ideas to people. It can be exploited by the non-formal education sector.

Four conditions have to be met if the nation's health is to improve markedly:

- political will
- appropriate technology
- intersectoral collaboration
- community participation.

Political Will

Since 1979 successive governments have adopted PHC as the bedrock of their policies. The PNDC has pursued the ideal within the dictates of the Economic Recovery Programme. International solidarity is manifest.

Appropriate Technology

Since 1984 UNICEF has promoted a child survival kit for:
growth monitoring
oral rehydration
breast feeding
immunization
family planning
formal education
and food supplements.

Intersectoral Collaboration

Health is not just a child of the Ministry of Health. It must involve agencies responsible for education, agriculture, water and sewerage, works and housing, local government, the Ministry of Finance and Economic Planning (MFEP) and the medical authorities.

Community Participation

You can provide a well for a community but you can't force them to drink from it. The provision of amenities is not enough. You must involve people when taking decisions that affect their lives. In this regard, I hope that District Assemblies will live up to expectations and encourage local initiatives.

For those of us not old enough to remember the promise of independence made by Osagyefo Kwame Nkrumah, I would like to remind you of his famous words: "My first objective for Ghana is to abolish poverty, ignorance and disease." He said we should measure our progress by the improvement in the health of people and the number of children in school and their quality of education and the availability of water in towns and villages and by the ability of people to manage their own affairs.

I want us to go out from here resolved to work together to ensure the survival of children and the health of all Ghanaians.

Discussion

In answer to questions from the floor about disunity between government agencies and NGOs, Professor Ashitey, said it was the fault of Government. It should have a master plan that outlines the country's needs and where these needs are greatest. The district assemblies are an

important vehicle for drawing up this plan; every district and region must identify their needs clearly and their priorities and funding requirements. Everyone from the conference should go back to their district assemblies and see what they are doing and how they can helped. It was pointed out that GWSC has a master plan for borehole and hand-dug well implementation but it was drawn up on the basis of the old 65 districts, and needs updating. When agencies with special interests come in projects should be farmed out to agencies with appropriate interests. He spoke of what he called the Matthew principle. Outside funding agencies need to report home to justify the money being spent. Therefore they are less willing to deal with societies in slumber (which need help most).

Dr Tinorgah said the work of government line agencies must also be co-ordinated. There is no Ministry of Development; but we have to think about a suitable mechanism to oversee developmental efforts. Government agencies are still working along vertical lines; there is not a horizontal coming together. He talked about a changed attitude towards community involvement. In the past agencies used terms like "defaulters" and "difficult communities", implying that outside agents are right and communities wrong. We have now realized that these assumptions are not correct. We should be seeing the problem the way those affected see it. Unless communities see some tangible improvement in their lives, they will not be convinced of the benefits of a project. We have to think of ways of measuring success.

Harry Reynolds (World Vision) said it was important a master plan was available for consultation before agencies go out to raise funds. There is no point in redirecting an agency to another district when they have raised funds for a particular community.

Clement Kwei (GWSC) said GWSC is already working on a master plan. GWSC goes to the Statistical Services and gets population totals and puts them in population zones of

- 0 - 500
- 500 - 2,000
- 2,000 +

Those in the 0-500 range qualify for rural water supply assistance in the form of wells and tapping spring sources. GWSC looks at what facilities are already available then concentrates on those communities with the least facilities. It then circulates a list to NGOs. GWSC's national borehole construction target is 6,000 in the next five years. Its national hand-dug well target is 10,000 (2,000 under PAMSCAD, leaving 8,000 for NGOs).

REVIEW OF MOLE I

On behalf of Mr P. O. Sackey, director of GWSC's Rural Water Division, Clement Kwei led a discussion on progress so far in carrying out the recommendations of MOLE I, a WaterAid funded conference held in July 1989.

Clement Kwei reported that although the task of co-ordination was not very easy, GWSC had done more than 50 per cent of its set assignment.

The original recommendations were as follows:

1. LOCATION

GWSC has been working on funding for aerial mapping. One system would be to allocate regions to donors interested in borehole drilling and stipulate that one requirement is that they provide an aerial map.

GWSC has appointed a research and development engineer to research solar sources. He will contact the Training Network Centre (TNC) and produce a literature list.

Land maps have been standardized to a scale of 1:150,000 and are being given a new numbering system based on this scale. GWSC is hoping to extend this system to NGO's; requiring them to give block co-ordinate numbers identifying their boreholes so that anyone going into the field will be able to locate them. Previously NGOs made up their own numbers for their sites. The only problem is that the Lands Survey Department is demanding money before they publish a complete set of maps. GWSC is still negotiating with them. Everyone agreed maps were crucial to any planning and getting a set of maps was a priority, otherwise planning would become a real bottleneck.

NGOs have not been very forthcoming in providing prior and post well location maps (the Catholic Church and Prakla Seismos are notable exceptions).

Mr R. R. Bannerman (Prakla Seismos) reported on progress on identifying water-indicating plants. He has been in touch with the National Service Secretariat (NSS) who have agreed to put service personnel at regional and district levels at his disposal. He has also contacted the Botany Department at Legon.

There are two ways of doing the survey: asking villagers their opinion of which plants indicate water or telling them what plants we think indicate water and asking about their incidence. The Botany Department's opinion is that service personnel should collect plants villagers believe indicate water, and bring them in sealed plastic bags for identification. Progress has been delayed because the Botany professor has gone on leave.

2. COSTINGS

(a) Maintenance Costs

GWS has been meeting NGOs and private companies informally to look into the question of minimum and maximum charges for borehole and hand-pump maintenance and hand-dug well maintenance (with and without pumps). However NGOs often don't separate the village level costs (they are incorporated into the whole water provision budget). GWSC doesn't want to assume that its costs are representative. It charges ¢120 per month per household for hand-pump maintenance (however this figure represents a subsidizing of the real cost). A survey by the Catholic Church in Wenchi indicates that they too are subsidizing maintenance heavily. If NGOs provide this information it will help determine which pump is best for standardizing - according to how much maintenance costs. Ron Bannerman (WaterAid) said the conference needed to clarify their terms of reference for its maintenance. Are we talking about the revenue costs only? Or the capital cost, including vehicles to service the pumps? Will it cover a total refitting if the pump breaks down irreparably? Should the policy be to charge the real cost to the community? Clement Kwei said that in the francophone countries around Ghana hand pump parts can be bought in the shops, so no central body is needed to do maintenance. GWSC would like to try this here. Once a number of pumps are standardized they could go on tender and be sold through local agents.

(b) Capital Costs

i. Boreholes

It was pointed out that there was no charge set down for putting a hand-pump on a hand-dug well. The meeting recommended that the recommendation on beneficiaries of hand-dug wells providing sand, stone and labour should be amended to add "and cash if they are able."

3. MACRO-ECONOMIC SURVEYS

The Ministry of Works and Housing (MWH), UNDP and the World Bank are carrying out a comprehensive study on rural water systems using Ghanaian consultants. The report is scheduled for release in May.

GWSC is doing its own social surveys at the beginning of each project to look at appropriate water systems and some NGOs are also doing so. GWSC is willing to offer advice on how to go about it.

4. STANDARDIZATION

The meeting to come up with a proposal for standardization of equipment and spare parts for boreholes did not eventuate. It would seem that there are about 12 types of pumps presently being used in Ghana. Erich Baumann (World Bank) said that the know-how about hand pumps is good enough that a recommendation to use only a limited number of hand pumps should work.

Standardizing down to two or three types would be appropriate. We should work towards this very quickly. The ideal pump will not exist till 2050; we can't wait for the perfect pump to be found. Clement Kwei said that GWSC tests hand pumps in every major drilling programme and standardizes for each project. He said they did not want to insist on everybody using GWSC's preferred pump. It would be difficult to convince donors.

Earl Turcotte (Canadien High Commission) replied that the Government of Ghana should take a hard line. The needs of the people of Ghana must come first; not donor needs. He said CIDA was committed to the principle of village level operation and maintenance (VLOM) and was waiting for Government to take a lead.

Because of budgetary constraints, ISODEC was not able to convene a meeting to come up with a proposal for standardizing hand-dug well equipment and spare parts. It is being rescheduled for April.

The Department of Community Development (DCD) convened a meeting on 17 January to come up with guidelines for minimum levels of community participation. Paul Alimbey reported:

Community participation is the phenomenon of getting the maximum involvement of local people for the successful planning, implementation, monitoring and maintenance of a project. It is essential to the positive outcome of any project.

Indications of community participation are:

- financial contributions
- material resources
- human resources
- logistical support
- provision of land for siting

Communities must:

- make a specific request for the project
- provide the land
- provide sand, stone (etc.) and labour for hand-dug wells and ¢60,000 minimum for a borehole
- logistical support for the technical team (e.g. food)
- contribute financially towards the maintenance of the system.

Information must be provided to GWSC on:

- the name and location of the community
- type of project
- name of executing agency

- total budget estimate including payment in kind, labour and materials
- the commencement date.

Checklist of steps to be gone through:

(1) do a baseline study on the area (DCD should be contacted for information first)
(2) analyse this data
(3) sensitization of people
(4) prioritization - beneficiaries must confirm whether water is a priority for them
(5) draw up a plan of action detailing sponsorship, terms, statistics, logistics, training, technology transfer, etc.
(6) prepare for informal launching
(7) sustainability

- a) management committee must be put in place including opinion leaders and leaders of political organs.
- b) an education programme should be designed to create awareness of the aims of the project.
- c) project review - community should review it as well as external agencies/sponsoring bodies.

A discussion ensued on whether it was appropriate to set up a management committee when there were already authority figures like chiefs, CDRs, etc who could play this role. It was agreed that community workers had to be flexible - in some areas already established leaders could manage the water system, but in others they are overburdened or not so willing. It was important to bring in other players (such as women who are usually under-represented in village leadership) as well as official leaders. Nevertheless, established opinion leaders should always be consulted and approval sought, whether or not they are responsible for the management

5. RESEARCH AND DEVELOPMENT

A Water Resources Research Institute (WRRI) representative had not yet arrived at the meeting so little could be discussed. However GWSC confirmed that a strong link existed between the two organizations and the information flow was happening.

6. ACTION

GWSC proposes to hold a meeting with all NGOs some time between July and September this year. It expects to use this forum to standardize a lot of things - both technical and social. Earl Turcotte (Canadien High Commission) asked that bilateral and multilateral agencies be included in this meeting.

Quarterly meetings of GWSC regional and district officers have not been held because policy to be disseminated is still being resolved. Similarly, regional meetings will be held once standardization proposals have been agreed upon. Clement Kwei said some NGOs had still not registered with GWSC. He appealed to them to do so. Reporting from the field has not been good enough. Often organizations don't even report on work done, let alone on finance expended.

The District Secretary for Adansi, Mr de Graft Adjei advised that the district assemblies needed to be informed that they were being asked to convene six-monthly district meetings of all interested parties. He informed the meeting that the technical and infrastructure committee was the appropriate body not the utility and social services committee.

7. NETWORKING

The Training Network Centre (TNC) clarified that that was its name not the Network Training Centre. It is in the process of recruiting a communications officer who would take care of pooling of information and compiling a register of equipment. In answer to questions Dr Monney (TNC) explained that the centre had secured funds for three more years of operation, and that this may be extended for a further two years. After that UST is expected to pay; so it is an ongoing project.

8. TRAINING

On October 14-15, 1989, TNC convened a workshop of training needs of user agencies. It is making a list of training systems and reviewing their curricula. A report should be out by the end of March.

Conference participants commented that the survey TNC sent out on qualifications/skills of organizations' employees was too detailed for them to answer. TNC should have sent out workers to collect some of the information.

• SMALL GROUP DISCUSSION

Participants broke into three groups to discuss:

(1) Integration, co-ordination and collaboration
   - What are the obstacles? What practical steps can be taken to overcome them?

(2) Community participation
   - Approaches and structures.

(3) Standardization
   - Choice of pumps. Costs.

The following report backs were given:

Group One

Obstacles to collaboration:

- Proliferation of multisectoral groups at district level eg. DHMT, PAMSCAD, leading to the dissipation of energy.
- Lack of information as to what different organizations are doing.
- Competing credit seeking arrangements.
- Regional and national level dictates interfering with district needs.
- Competition over resources and manpower. Some equipment or expertise is being underutilized while the demands on other equipment or skilled people are too great.

Steps to overcome these problems:

- Respect district level planning, eg. interface water provision with immunization needs.
- A strategy for collaboration should be discussed with a commitment made by Government, NGOs, funders and government agencies to work in harmony.
- Identify focal people in the district to whom issues gravitate. UNICEF uses this approach successfully. Committees can be difficult; one person can be easier. She or he can act as a clearing house for calling meetings, dispensing information and reporting to district assemblies.
- Greater information pooling must occur at a national level.

Group Two

Government structures in a locality cannot be sidestepped. The district assembly is the highest local authority. The point of entry to any community should first be the district secretary. Projects will fail if these two channels are sidestepped. But for community mobilization, agencies can choose their intermediary eg. churches, CDRs, a management committee. Before entering a community, contact the Department of Community Development (DCD) and the district administration to gather information about the economic set-up, and the political, cultural and social life of the people. Government agencies and NGOs are in a hurry

to achieve results. An alternative is to spend a year or two collecting information in a community. The very presence of an outside agency asking questions about local problems will start the process of community animation. Once this ground work has been done the results can be far more effective and long lasting than in a rushed project. Once an outside agency leaves, the district assembly should ensure sustainability.

Group Three

Standardization is not a new thing. Already 7,000 hand-pumps (from the Upper Region programme and the 3,000 pumps project) are of three existing pumps. The rationale for standardization, is:

- price
- shipping
- training
- large market can make local manufacture more worthwhile
- easier maintenance

Standardization does not mean just one pump; but it should be less than four. Standardization must:

- take into account the differing hydrogeological conditions in the country
- strive for interchangeability of pump parts
- include the VLOM principle
- specify a pump that is corrosion resistant and of internationally recognized specifications
- set up a body to monitor changes in technology and introduce new standards once tested.

How

- select appropriate technology (field tests are necessary as well as laboratory tests so social and cultural factors are taken into account)
- impose discipline on the actors in the rural water sector
- identify the appropriate body to oversee (GWSC in collaboration with the Ghana Standards Board is probably best)

It will be necessary to persuade the Government of Ghana to make a strong commitment towards standardization. They will need to negotiate with donors about what is acceptable. Most well intentioned donors will fall into line if their interests are in developing Ghana, not promoting their own country's products.

Further Points

Ato Brown (Kumasi Sanitation Project) made the point that a truly disinterested body should be charged with responsibility for standardization. We don't want to standardize just to fit GWSC's sponsored pump.

• Day Two

Saturday 10,March

Chairperson: Mr. Peter Kpordugbe, director National Service Secretariat

Summary of an address by Dr Tinorgah

WATER QUALITY AND DISEASES OF CHILDREN

Quality of water is defined by:

- colour
- taste
- chemical content (deficiencies)
- microbiological content

I will restrict this talk to microbiological content. My angle will be how to protect children, and the implications for project design.

Bad water affects weak people. Children are weak. They are more susceptible to any negative factor in the environment.

Three mechanisms allow ill health.

1. Direct

Water is polluted by germs This is usually through contamination by faeces. Diarrhoea, dysentery, hepatitis and typhoid can result. Diarrhoeal diseases are the number two cause of ill health, second only to malaria, of patients visiting health centres. If you ask villagers, they will say diarrhoea is their number one health problem.

Diarrhoea affects children more frequently and more seriously because:

- it is dose dependant and smaller bodies are susceptible to smaller doses of germs
- their intestinal immune system is often not very developed
- they are less able to withstand dehydration. Two or three bouts of diarrhoea and a child is in danger of dehydration.

Ten per cent of deaths of children in Ghana are the result of dehydration from diarrhoea.

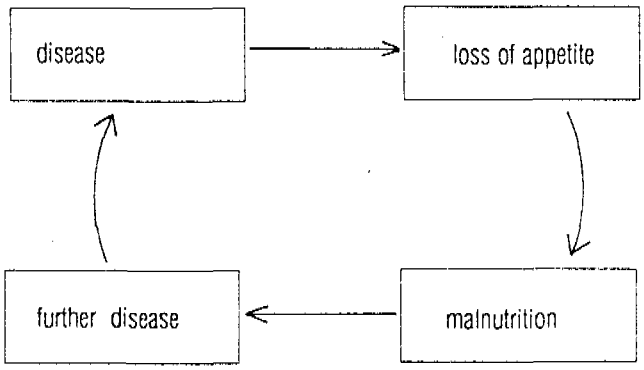
Schistosomiasis (bilharzia) breeds in water and enters the body through the skin. In some areas it is very common and children are the highest sufferers. In these communities it is expected that boys urinate blood (boys play more often in water than girls) and parents get worried if their boy's urine is clear.

Water is not the only way you can get most of these diseases. Flies, poor hygiene, not washing one's hands and eating soil all foster the spread of disease.

The implication for project design is that you cannot isolate water. You also have to deal with hygiene, and health education.

2. Multiplier Effect

Children are predisposed to getting other diseases after contracting the initial disease. A lot of children are on the borderline of malnourishment. Any destabilizing effect can push them into malnutrition. Diarrhoea causes lack of appetite. For those who are not well fed, loss of appetite can be dangerous. Vomiting can occur with diarrhoea, with the result that the child does not absorb any nourishment. A malnourished child is susceptible to a lot of infections. It is a vicious cycle.



Only death or an effective intervention will stop this cycle.

3. Indirect

A special characteristic of children is their dependency. They need to be physically cared for and an income earned to provide their needs. Anything which affects the time or ability of adults to do this affects children's health. For example guinea worm can restrict parents' ability to farm. Malnutrition is not just about the availability of food, it also involves a lack of nutrition. A lack of time or knowledge to prepare wholesome meals may push a child towards the brink of malnutrition.

Lessons

Water quality is important. A safe source should be produced or existing sources protected from contamination. Improving the sources alone will not work. There has to be a sanitation and health education component. PHC is important. Medical care must be available because no matter what we do, we can not put an end to all diseases. Oral rehydration therapy, immunization, and maternal and child health issues are important here. In one part of Northern Region, Salaga, for every thousand children born, 45 mothers die. It is as high as 59 in another part of the region. Developed countries measure maternal mortality rates according to 100,000 births, and the figures are more like one death to every 100,000 births.

We cannot run away from the fact that women are the primary managers of water within the family. All programmes - whether providing water, doing health education etc. - have to be adapted to reach them.

Summary of an address by Dr. Amuzu (WRRI) on the chemical content of water.

He advised everyone to get hold of the WHO pamphlets on guidelines for water quality. It is published in three volumes and is available free from Geneva.

Unappealing colour can be a result of iron (oxidization) or humic acid. As far as health goes the following chemicals are important.

nitrate	-	If the nitrate level exceeds 45 ml per litre it can change to nitrite in a child's stomach. The nitrite atom then hooks on to the haemoglobin in the blood, preventing sufficient oxygen from being absorbed. It results in the blue baby phenomenon. Excess nitrate is a problem in Ghana because of the seepage of nitrate fertilizer into boreholes.
lead	-	Soft water dissolves lead in the pipes. Lead is a cumulative poison. It reduces a child's capacity to learn.
fluoride	-	Excess may cause dental caries.
arsenic)	-	All adversely affect children. Arsenic and mercury are particular problems
copper)		in mining areas.
mercury)		

Unfortunately Ghana does not have its own drinking water standards and just uses the WHO level. The Ghana Standards Board is in the process of discussing it.

Further Comments

Professor Ashitey said schools should train people in basic hygiene and sanitation and water practices. However the problem is that most schools do not have even basic sanitation facilities so children are not being taught healthy practices.

He said breast feeding was important in combatting infant susceptibility to disease. Government should offer two years' maternity leave for female employees. Family planning campaigns should be supported to cut down the maternal mortality rate. Female education is very important. Educated women make better mothers and can teach their children to adopt better habits.

Dr Monney (TNC) said not enough was being done to monitor the quality of water. It is not enough to provide ground water. You have to make sure it is healthy.

Summary of an Address by Ato Brown, Kumasi Sanitation Project

RESOURCE MOBILIZATION

Resource mobilization is not a new phenomenon. It works excellently for funerals. It has not worked as smoothly for water. When GWSC used to own all water facilities the community felt a loss of ownership and were not very willing to contribute. Tariffing from above does not motivate a community to maintain the water system. These days there are so many demands on communities (building JSS, digging community gardens for nutrition projects etc). That water and sanitation contributions can be seen as another burden. Since the cash flow is tight in rural areas, appeals for contributions have to be timed to fit into the cash flow cycle.

A new term - sustained maintenance - has been popularized, a requirement that can only be met through real community participation. Often education and resource mobilization are treated as extras to be tacked on to project design. A commitment should be made towards sustained maintenance in every budget. A figure for discussion purposes is 25 per cent of budget.

Different approaches to resource mobilization include:

- credit schemes on a long term recovery basis
- cost sharing (on a cedi for cedi basis)
- sweat labour conversion into cash
- levies

Subsidization is going out of currency. It makes central government too important in the eyes of the people. They lose their faith in their own potential.

Communal labour systems need to be discussed. Should all villagers be asked to work on the same day once a week? Or should people be allotted separate days once a week so consistent work can be done?

Further Comments

Ron Bannerman (WaterAid) said the issue is not whether community participation is a good idea; everyone agrees it is. The point is how to do it. Before you do animation you need animators. They must be trained. But before you train them you need to know what to train them in.

Ato Brown replied that the principle may be accepted at this conference; but outside it lip service only is being given to it. You only need to examine the lack of provision in budgets.

Hippolyt Pul (CRS) said the words community participation imply that we are bringing in a project and asking the community to participate. We have to reorientate the planning process *using communities' own priorities as an entry point.* Fuseini Iddrisu (Amasachina) echoed this concern. Agencies should not go into a village for the purpose of providing facilities. Go in to support the leadership of communities. When they hold a meeting to decide about they want, discuss the options with them.

Summary of a presentation by Mrs Bawa, Northern regional home science organizer

MOBILIZING WOMEN FOR DECISION MAKING IN WATER PROVISION.

Women are central to the success or failure of water and sanitation. Their attitudes have a profound influence. Women have traditional responsibility for drawing and managing household water. It is important that women are considered in the design of hand pumps. Too often their needs are ignored. One inconvenience (walking long distances to fetch water) may be replaced by another (too heavy pumps). In one district in Northern Region 160 pumps have less than operational usage, partly because of unacceptability to users.

All projects should actively involve women. Women's groups are a natural entry point for planning projects. There is a strong culture of sharing amongst women. We don't talk of "I", we talk of the whole family. They need to be involved at all stages - design, implementation, operation and maintenance.

I am not saying men should abdicate responsibility. They should share decision making with women. Women need to unite and men should support us, come with us, pull us along.

Women can be active in enforcing standards of behaviour around the well or borehole site. Training is important if you are to get the most out of women's potential especially technical training. Educate a woman and you educate a nation.

Women are so saddled with work. They need time to rest, time to exercise their political rights (even children want to be involved in decision making). Improved water facilities will free up women's time. They can use that time productively for income generating activities. We do not want to wait for men to give us chop money. We want to have our own income and take our own decisions.

Further Comments

Dr Tinorgah (NORRIP) said we are beginning to talk about gender issues, meaning that we are starting to realize that women's attitudes are not the only ones that need changing. Men also must change. We need some kind of structure to take on board women's issues. In some districts girls' enrolment in schools is as low as two per cent.

Summary of a presentation by Simon Aaneyh and Ross Kidd of the Water Utilization Project

WATER EDUCATION FOR HEALTH

WUP is an interagency project funded by CIDA and attached to GWSC. The aim of the Water Education for Health (WEFH) unit is to maximize the benefits of pump water. It involves health education on a massive basis - in about 5,000 communities in Upper West and Upper East. The project is an afterthought; the education should have been done before, during and after the technical provision of water sources.

At the beginning

There were 2,700 pumps. All pump caretakers were men. Field workers had low morale. They used lecture methods to communities. Agencies worked in isolation. Management was by motorola from Accra.

What we did

WEFH unit was set up to co-ordinate health education and produce materials. A Ghanaian team was seconded from participatory agencies. An interagency approach was adopted. GWSC, DCD, MOH, women's groups, farmers, extension services, district administrations, CDRs, NGO's etc. were brought together to:

- pool resources
- devise a common focus
- enable joint decision making

The aim was community control rather than just participation. The result was mass impact and mass coverage. One group conveys one message rather than communities' time being wasted by a proliferation of groups with separate messages.

The unit of education is the pump community - houses that fetch from the same pump. The target audience is women. Women are the programme implementors.

Field workers

- formed into interagency teams
- given continuous training using interactive teaching
- given practical assignments

But field workers were too few to reach the whole area, especially considering the lack of vehicles. So field workers were complemented by community water organizers (CWOs) . These are para professionals, living in the community who assist government extension workers. Each pump community was asked to choose one man and one woman CWO. They absorbed the role of the previous hand pump caretakers, carrying out pump maintenance duties as well as health education. The advantage is because they are selected by the community they are also accountable to them. They were given training and support and assigned manageable tasks. They were formed into teams (there are several pumps in most villages, so the CWOs were brought together) to complement each others' skills.

The result was:

- mass coverage
- continuity
- a tapping of local talent
- peer communication (local people speaking the language of the communities affected)

Networking

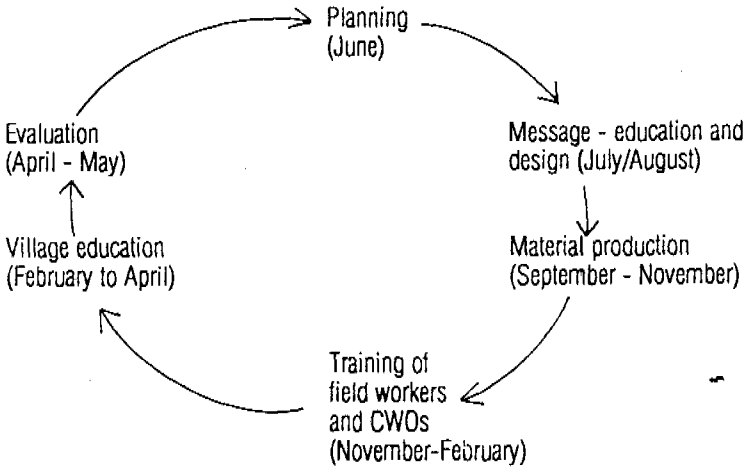
A structure to do the training had to be set up. An organizational chart would look like this:

Regional team (policy and liaising with agencies)
|
WEFH (co-ordination)
|
District teams
|
Field workers
|
Trainers
|
Community water organizers

The best field workers become the trainers.

Programming had to consider seasonal changes. For example, in the dry season there is more time to attend meetings. Topics also had to be phased and single topics identified to avoid information overload. One topic per year was decided upon. Half a year is spent preparing for a campaign and the other half implementing it.

Annual campaign cycle



Methodology

Education methods are:

- interactive/participatory (discussion is the core method)
- teacher proof (do not need outside material)
- culturally appropriate

They include songs, pictures, drama, meetings, home visits, clinic talks and radio broadcasts. The winning method was found to be the picture book followed by discussion and songs. Each CWO is meant to form a radio group of at least 20 to listen to special programmes prepared by the URA FM Station at Bolga. These broadcasts reinforce messages villages have heard from CWOs.

Training systems

This year between February and March WEFH is running over 60 courses. It is a tiered approach.

11 WEFH training teams
|
field workers
|
trainers
|
CWOs

The courses are organized zonally so that trainers come to the people. They consist of small groups under a tree.

Summary

It is a success because:

- it is well funded

- of interagency integration (both of personnel and messages)
- of decentralized implementation
- of continuous training (so the message is not lost)

WEHI has not set up village water committees. It might do so at a later stage, but at the moment CWOs are the vehicle for education. Half the CWOs are women. Fifty per cent of the Ghanaians on the project are women including those in senior management positions.

Bottom up accountability is emerging. CIDA and GWSC are taken to task by villagers when commitments are not kept.

Further comments

In answer to questions Simon Aaneyh and Ross Kidd made the following points: The budget for 60 training courses this year was close to ¢4-5 million. It involves 5,000 communities with 20 in each radio group, making 100,000 direct participants in the learning programme. Of course there is a spin off - there may be another 200,000 reached. CWOs are asked to spend 30 minutes to one hour each day on the project. A lot of work is done informally, eg. a woman talks to other women as they collect their water. There are some incentives (a radio, a certificate, T-shirts) but no financial rewards. A message went out on the radio that CWOs are not paid and need community support. Volunteer motivation is one of the issues that WUP is struggling with. They do not have any ready made answers.

CIDA is now in a transition phase of handing over to Ghanaian leadership. It is looking for a mechanism to make sure activities can continue without external funding.

The programme has a full time staff of four in its monitoring and evaluation unit. They provide data at both a formative and summative stage. They do studies before and after campaigns eg. on what villagers know about guinea worm. They measure on site developments (ie. how the structure is being looked after) before and after education.

Small group discussion

Participants broke into three groups to discuss the following topics:

- Women's participation - how to ensure more women are involved in decision making
- Community organization participation/education - how to go out about it
- Water quality monitoring - how to establish a workable set of standards and monitoring system.

Report backs were as follows:

1. Women's participation

Water can be used as an entry point to rural development. It can be used to encourage conditions which actively involve women in decision making.

METHODS:

i. use women as community trainers

ii. build upon women's traditional roles

iii. strengthen existing women's structures

iv. use women as community animators to present a positive role model

v. institute confidence building exercises eg. training women in traditional skills for maintenance.

vi. allot women specific tasks

vii. recognize positive discrimination/affirmative action (specifically appointing women to certain positions) as a legitimate method of redressing past inequalities which have excluded women from decision making.

viii. training materials should avoid role stereotyping (eg. show girls and women in a range of activities, not just cooking or carrying water).

The aim is not to provoke conflict between men and women. But as educators we must recognize that changing age old attitudes can create conflict. Men will feel their power base is being threatened. But there are positive ways of handling that conflict - eg. using drama to portray conflict between men and women, then getting the audience to discuss ways of resolving it.

Long term measures

- *Broadening the concept of women's roles and increasing the range of girls' skills must be* addressed at the school level.

- Traditional rulers and men in general must be educated on the need for changes in women's position and the positive benefits of change.

- Parents should be encouraged not to discriminate between the sexes in the division of labour and assigning tasks.

- The household workload must be redistributed and men persuaded to share the burden of housework to free up women's time.

- Labour-saving devices (grinding mills, hand pumps) should be introduced where possible to aid women's participation in matters outside the home.

Further discussion

Fuseini Iddrisu (Amasachina) stressed that cultural practices have to be respected. In some communities it would be an insult to women if men help in the kitchen. Tony Dogbe (VSO) replied that culture can be overstressed. Slavery used to be an acceptable idealogy, but conditions change and ideas have become more enlightened. The same goes for attitudes about women. Erich Baumann (World Bank) argued that men have to accept that their role as dominators of women has to change. Ghana is in the process of changing from a self-sufficient agricultural society to a modern state with up to date communications technology. This will necessarily involve a change in social attitudes.

2. Community participation

Why do we need it?

i. It ensures ownership of the facility and therefore community maintenance is more viable.

ii. It is an opportunity to strengthen the organizational ability of communities. It goes beyond water; we should be building a capability for general community development.

iii. It is a strategy for change. If the community participates in the process they will understand the consequences of change.

iv. It is an opportunity to break down certain barriers, eg. against women's participation in decision making, or taboos against subjects relating to their chiefs.

v. The Government cannot do all of Ghana's development.

How to do it?

The group came up with two extreme positions that were finally integrated into a middle ground. The extremes involved finding out communities' priorities and simply acting on them (not forgetting of course that leaders' priorities may not be the same as the people's), or going in with our model and promoting it (though this can reduce community participation to community hospitality in practice). The middle ground was to find out people's priorities and expose them to the realities of development. For example, Amasachina arranges exchange visits for communities to observe developmental efforts in other communities.

The point of entry is the community's aspirations. It may be that they want a signboard to point out their village. Help them construct one then try to expand their vision. A community asking for unreasonable things may be a defensive reaction because they have been let down by donors before. They may be testing out how serious an agency is. Negotiate with such communities.

Water quality

It has aesthetic and health related constituents. Quality changes over time.

What is needed?

- Ghanaian specific standards
- pollution controls need to be more widely known about
- monitoring and standardization of discharge into surface water because it can contaminate ground water
- environmental impact assessments to judge water projects will have adverse effects on water sources
- to test water over time (baseline study of source, then measuring change)
- to know what is in the water. Simple battery operated bacteriological kits are available to do field tests. Most projects are miles away from labs and samples need to be tested within a certain time.
- education to stop contamination of the water source
- to make it compulsory to disinfect wells after construction
- to decentralize monitoring to the regions
- to write a checklist for communities to monitor the state of the source and protect against pollution
- to site sources properly in order to avoid contamination
- to arrange to provide a community rope and bucket for all wells (even in the case of a hand pump, it can used as a back up)
- to ensure storage and retrieval systems for water quality monitoring data are sound and efficient.

Jan Davies (OXFAM) explained that bacteriological field kits are expensive (around ¢500,000) and it is unrealistic to expect regular monitoring of 10,000 hand dug wells in the

short term. Communities have to be encouraged to monitor quality (changes in taste and appearance) and the physical structure. Then if danger signs are apparent, scientific bacteriological tests can be arranged.

As a compromise to the community bucket system he suggested households might be allowed to provide their own bucket as long as it is kept only for water collection.

Summary of an address by the District Secretary for Adansi, Mr de Graft Adjei

INTEGRATING EXISTING LOCAL STRUCTURES FOR EFFECTIVE ACTION

Past governments have concentrated on projects as an end in themselves without focussing on the human beings involved. Now people are at the centre of development.

Community organization used to be a clear-cut process. The chief would call his council to discuss refuse problems etc. But traditional structures are eroding over time. Outside agencies have entered the arena and other government structures (district assemblies) have been set up. Training needs to be organized for local leaders.

GWSC and NSS started a programme in 1985 to dig 10,000 wells. It ran aground because of lack of manpower in the field and lack of training. A political commitment is needed for social mobilization. The PNDC is now doing this. The district assemblies are charged with developing strategies for mobilizing all resources (human, material and financial) for community development. The position of the PNDC District Secretary is supreme. He or she is the chief executive of the district. The DS is charged with the day-to-day implementation of the assembly programmes. (S)he has the last say if people want to purchase land. (S)he can co-ordinate the activities of decentralized units of GWSC, DCD, CDR's, 31st December Womens' Movement.

District mobile planning teams are supposed to relate to district assemblies and come out with a master plan that all agencies should work with at district level. Under the district assembly there is meant to be a unit committee to link up with CDRs. A law is about to come out setting out the role of a unit committee. It is likely it will abolish the old town development committees.

Further comments

Peter Kpordugbe (NSS) said the district assembly is only one year old. We should agree to strengthen existing institutions. Even by passing through the DS you will strengthen his/her role.

Kwadwo Owusu (CDR) appealed to development workers to work with CDRs. Everybody is supposed to be a CDR member. People should not fear them; they are not witch hunting organizations. Their purpose is to help the community.

Kojo Mbir (CDS) drew attention to the danger of a DS being identified closely with a project (as some will try to be to gain from being associated with a beneficial project). If s/he moves with the community animator it will mean top down decision making because people will be loath to disagree with him/her.

Ron Bannerman (WaterAid) said consultation with the DS was a simple process with immense benefits. The DS can get hold of controlled price cement for wells.

• Day Three

Sunday 11, March

Chairperson: Ron Bannerman, WaterAid Ghana

Summary of a paper by Dr Edwin Amonoo, Centre for Development Studies, University of Cape Coast (read on his behalf by Kojo Mbir)

MONITORING AND EVALUATION OF RURAL WATER AND SANITATION PROGRAMMES - THEORETICAL CONSIDERATIONS

The aim of this paper is to try to formulate a theoretical model focussing on the districts. It is a preliminary paper and needs developing.

Although the water decade is coming to an end we still have a long way to go to meet the objectives. Water coverage is 92 per cent in urban areas but only 42 per cent in rural areas. Sanitation facilities are available to 60 per cent of urban dwellers but only 15 per cent of rural people. Nationally, safe water is available to 60 per cent of the population, and sanitation facilities to 30 per cent. This level is hardly satisfactory. It raises concerns about the less than effective use of resources to achieve this outcome. The lack of a well marked out monitoring system has contributed largely to the poor results.

The aims of a theoretical model are:

- to provide a consistent and logical framework for monitoring
- to be able to be used to reevaluate the original design after implementation, to work out if the outputs are achieving this aim.
- to contribute to the identification of information needed for the management of the sector.

It is based on the following assumptions:

- the rural water programme has clear goals and objectives, instruments and means
- outcomes are expected within a time framework
- measurements have been decided upon
- a benchmark survey has been done on problems in the locality

One measurement technique is to analyse the percentage contribution to existing coverage. How much of a reduction has been made to the incidence of water borne diseases and improvement made in sanitation practices? Here the assumption is that an absence of water and sanitation facilities is the cause of water borne diseases.

The target (for the purposes of this paper) is to provide hand-dug wells for a further 30 per cent of the rural population to bring the total of rural water coverage to 70 per cent. This would involve providing wells to 1.6 million people in communities of 250 or less. Sixty per cent achievement of this target (i.e. 960,000 people benefitting from an improvement in water supply) would be the minimum acceptable level to make an impact.

Ascertaining the level of community participation

Verifiable indicators:

- community must realise water and sanitation practices are a major cause of ill health
- a high level of self sustaining participation must be reached including contributions of money and kind, involvement in planning, construction and maintenance.

Means of verification:

- 90 per cent of adults must be able to formulate the water and sanitation problem facing the community.

It is assumed that interagency co-ordination is in place.

Ascertaining the output

Verifiable indicators:

- A reasonable quality of 3.3 gallons per capita per day

Means of verification:

- Number of people not going to the original source

Contributions

Government agencies and NGOs should provide the following easily measurable inputs:

- labour
- capital
- time
- materials
- equipment

The donor agencies should contribute 50 per cent of capital costs, the Government 25 per cent and the beneficiary community the remaining 25 per cent.

Management

Verifiable indicator:

- Managers should be able to have an information feedback system specifying information resource requirements at various planning levels.

Means of verification:

- Information systems should be able to nip failures in the bud.

Resources must be made available to create monitoring and evaluation units working at all levels and stages. People have to be trained to design monitoring and evaluation programmes.

Summary of an address by Clement Kwei, GWSC

PRACTICAL CONSIDERATIONS

Monitoring is not easy in the Ghanaian setting. We are dealing with 40,000 little communities dotted all over the country. Resources are not there for extensive coverage. The Ministry of Works and Housing has overall responsibility for water whereas sanitation comes under the Ministry of Local Government. Nowadays sanitation is increasingly being taken into account in water programmes which means that separate ministries with separate monitoring systems create problems.

Better feedback by NGOs and donor agencies to GWSC is needed if better monitoring is to occur. We have to consider monitoring and evaluating within the context we are working in, i.e. look at the constraints, not just work on theory. For example, there is a preferred well depth but if you do not have a pump you simply have to compromise . Inputs are not being used efficiently. GWSC has ten rural water engineers but half do not have vehicles, therefore their output is severely reduced.

The main verification should come from the community since they should own the facility. The community should contact the agency if their hand pump fails. They should not rely on routine checks by outside agencies. Top level verification should only be in the form of guidance not direction. Community participation is part of verification. If the local people are really involved they will know what is happening to the facility. Education is integral to evaluation. If people still think cattle drinking is more important than their own health then the project has been a failure.

Further contributions

The following people were called upon to explain how they monitor and evaluate on the ground.

Ato Brown (on Operation Dry Throat)

The 10,000 wells campaign occurred at a time when there was no institutional framework for sustained maintenance. (There are now rural water engineers in the regions concerned.) A year after providing structures, planners went back to find them not working.

In the Central and Volta Regions pilot projects, a checklist was used in the planning and construction stages. Weekly visits were made for six weeks to supervise construction and usage. Sanitation around the well was looked at as was the response of the community to water quality as well as samples being taken of water.

He passed around the structure of a logical framework analysis (LFA) which compresses all the information needed onto one page.

LFA	Verifiable Indicators	Means of Verification	Assumptions
Goal			
Objectives (break down into activities)			
Targets			
Inputs			

Harry Reynolds (World Vision)

World Vision has about 378 wells throughout the country . It has its own drilling crew, including installation maintenance and training teams. A year later they go back to carry out routine maintenance and find out now the community are accepting the wells. Geologists go around to inspect difficult wells.

Dr Tinorgah (NORRIP)

NORRIP is in the process of setting up a system which splits monitoring (checking whether the project is on track) and evaluation (an independent consultant examining if the project is working).

Monitoring will be based on a concrete work programme, incorporating a breakdown of tasks, and converted into indicators for checking purposes (eg. have we carried out the number of training sessions planned?) Verification is done by project staff visiting field sites. Line agencies report to NORRIP for monitoring purposes.

Jan Davies (OXFAM)

Since the aim is improvement of health rather than monitoring just the physical structures, Oxfam monitors the health status of the population over a period of time. In the first year a baseline health survey with specific reference to water borne diseases is done by a MOH seconded staff member. About three years later another survey can be carried out to see the improvement in health. Endemic diseases in particular communities would be used as indicators eg. a survey of guinea worm. The health survey might bring out other problems that are not solved by water. In these cases, it is important to share the information with the relevant authorities.

Oxfam is looking at a checklist of things that the community can look for so that they can report to the district assembly if it looks like pollution is occurring.

Discussion

Erich Baumann (World Bank) talked of the difficulty of measuring improvement in health. Diarrhoea is also connected with nutrition and status of the family. Physical studies and impact on the community are easier to assess.

Dr Tinorgah (NORRIP) said reduction of guinea worm is a better indicator as its direct cause is bad water. Diarrhoea is more difficult because its causes are many. He squirms when he hears people say the goal of providing water is better health. Better health is not an end in itself. We have to look at something beyond health - general human development.

Ross Kidd (WUP) said if we are serious about community participation then the evaluation needs to be simplified and brought down to the community level. We need to find the language and tools so that the process can be put in the hands of the people. A lot of spin offs will have nothing to do with water provision, eg. better community organization, women having more say.

Donald Amuah (NORRIP) said a way of recording village level interaction is to have a visitors' book to record visits to the community and purpose.

Ron Bannerman (WaterAid) said there were two tiers of evaluation - one to suit funder's needs (which often involves the more quantifiable indicators) and your own self-evaluation which will probably include more of the intangibles like community organization.

Lawrence Agbemabiese (TNC) said one way of measuring the strengthening of community organizations is to look at how much the level of external support has been reduced.

Participants spent the rest of the day formulating resolutions.

• RECOMMENDATIONS FROM MOLE 2

A conference on rural water delivery March 8 - 12, 1990

Review of MOLE I

Most of the recommendations from MOLE 1 have not been fully carried out, so they still stand. Organizations and individuals are urged to fulfil the commitments they made at that meeting. In addition, the following supplementary recommendations (grouped according to the MOLE 1 headings) were made to aid their implementation.

1. LOCATION

Land maps are crucial to rural water sector planning. The Lands and Survey Department should be urged to publish and circulate all maps. GWSC should approach the Lands and Survey Department to find out what the constraints are, and if finance is the main stumbling block GWSC should provide guidance on mobilizing funds.

2. COSTINGS

(a) Maintenance costs

NGOs need to provide GWSC with information on maintenance costs and charges for hand-dug wells and boreholes.

(b) Capital Costs

The GWSC-convened conference for NGOs later this year should consider a standardized charge for providing a hand pump on a hand-dug well.

4. STANDARDIZATION

Standardization of hand pumps is crucial if the goal of village level operation and maintenance is to be achieved and local manufacture of parts is to become economically viable. It must be done quickly; Ghana cannot wait for the perfect pump to be designed. At this stage it is possible to standardize down to three or four types. These could be revised periodically to keep abreast of changes in technology.

Any standardized pump must be:

(i) of international specifications
and (ii) corrosion resistant.

Back-up controls to enforce standardization must be devised.

The GWSC-convened NGO conference should look closely at how to standardize hand-dug well structures.

6. ACTION

The MOLE 2 conference organizer should bring to the district assemblies' attention the important role they could play in convening district meetings, at least twice a year, of all parties interested in rural water provision.

The conference organizer should send copies of the MOLE 2 report to all District Secretaries.

MOLE 2

OVERALL PRINCIPLES

Water is not simply a technical intervention. It is a means to achieving better health for all. It would be short sighted to plan for water without taking into account sanitation, education, resource mobilization, community organization and community participation.

Priority in selection of sites for rural water projects should be given to areas least served by existing water and sanitation facilities.

All water and sanitation projects should be organized in such a way as to provide a training ground for technical personnel and local artisans and should also be used to improve the organizational levels in communities to facilitate future development programmes.

COMMUNITY PARTICIPATION

The principle of ensuring maximum participation of local people in the planning, implementation and maintenance of any project must be accepted and acted upon by all involved in the water provision process.

The Government of Ghana and all its agencies should reserve the right to refuse to sign contracts for rural water projects unless the project contains a specific provision for human resource mobilization.

PRACTICAL STEPS

The community must provide the land for every project and a realistic contribution of labour, practical support and locally available materials.

Before a project begins the following must occur:

- A baseline study must be done.
- The people should be consulted, educated and priorities identified.
- *Project implementors should prepare a plan of action setting out sponsorship,* logistics, training, technology transfer and terms of contract.
- A local management body must be established at village level including opinion leaders (both informal and formal leaders), political organs and women.
- Existing opinion leaders must be supported and given training.

CO-ORDINATION

The district assembly and its chief executive, the District Secretary (DS), play a very important co-ordinating role in the districts. The DS is an ideal entry point and should not be bypassed.

The Department of Community Development (DCD) has a crucial role to play in co-ordinating community animation and education in the field. In the same way that NGOs at MOLE 1 agreed to support and network with GWSC, NGOs should work with DCD (providing technical support and helping to mobilize finance) to enable it to play this co-ordinating role.

For DCD to function more effectively it has to:

- review its role and practices
- increase its staffing levels
- set up a research and development unit to look at community animation
- draw up an ongoing and countrywide programme for community animation in order to create favorable conditions for agencies to undertake development projects.

At the beginning of every project the district level DCD must be contacted to provide information on the social environment.

DCD should compile information from agencies working on the ground about strategies and successes in community mobilization.

NGOs should make use of DCD's already existing in rural training centers (information about which will be appended to the MOLE 2 report).

WOMEN'S PARTICIPATION

The crucial role of women as water managers and users must be recognized and concrete steps taken to ensure their full participation in the water provision process.

The provision of water must be seen as an entry point to be used to encourage conditions which involve women in the general decision making of a community.

The aim of broadening women's roles is not to provoke conflict. However it must be recognized that conflict will occur when men's traditional power is challenged. It is important that conflict is handled in a constructive way and cultural sensitivities taken into account.

PRACTICAL STEPS

Women's participation can be boosted by:

- building upon and enlarging women's traditional roles
- strenthening existing women's groups
- using women as trainers and animators, thus providing positive role models
- building women's confidence through training, especially in technical skills
- alotting women specific tasks in the water project
- making sure training materials avoid gender role stereotyping
- accepting affirmative action (taking steps to promote women's representation in decision making bodies and in some cases favoring the appointment of women to high decision-making offices) as a legitimate method of redressing past imbalances which have disadvantaged women.

FUTURE GOALS

Traditional rulers and men in general must be educated on the need for changes in women's position in society and the positive benefits of change.

Broadening the concept of women's roles and increasing the range of girls's skills must be addressed at the school level.

Organizations participating in conferences such as MOLE 2 should think more carefully about making sure women are represented on the conference floor not just in the kitchen.

WATER QUALITY

Ghana needs to establish its own standards of drinking water quality. This should be done through the Ghana Standards Board in consultation with GWSC and WRRI.

It should be mandatory for water providers to disinfect wells after construction.

Water needs to be tested by the water provider at the start of use of a well, then over time to measure change. Testing must take place more regularly in the case of open hand-dug wells than pump-enclosed ones.

Funding should be mobilized to bring in bacteriogical field test kits so that water testing can be decentralized to the Regions. To this end GWSC should also draw up equipment lists for Regional laboratories.

A less costly back up measure is to make sure communities can monitor visible signs that pollution of a water source is likely to be occurring. Jan Davies of Oxfam, Hans Vos and Fati Mumuni of Village Water Reservoirs should write a checklist of these visible signs. Jan Davies is also charged with writing an explanation of water quality testing for the report.

In order to prevent pollution, communities should be encouraged, wherever possible, to put hand pumps on hand-dug wells or at least design a structure which allows a pump to be added at a later stage.

FUTURE CONFERENCES

GWSC should contact the Ministry of Works and Housing (MWH) to ask that NGOs be invited to the June conference at which the World Bank rural water sector review is being launched. Although it is primarily a donor conference, it is a unique opportunity to bring together multilaterals, bilaterals, government agencies and NGOs. It is also an ideal forum for mobilizing funds (eg. for bacteriological field test kits, land map production and DCD strengthening).

MWH should be encouraged to organize two yearly national meetings of all organizations involved in rural water provision.

In the meantime until the Ministry holds these regular meetings, MOLE-type conferences should continue annually, seeking to network a broad spectrum of players in the rural water sector. More effort should be put into making sure the Secretary for Works and Housing is aware of the MOLE meetings.

National MOLE-type meetings should be held in the first week of March and invitations sent out well ahead of time to make sure that people working on the ground can plan to take time out from dry season construction.

• Appendix I

Rural training centres of the Department of Community Development

The Department has at least ten Rural Training Centres spread throughout the country with one in each region. They are located as follows: Wa (UWR), Navrongo (UER), Nyohene-Tamale (NR), Sunyani (BAR), Kwaso (Ashanti R.), Kibi (ER), Ho (VR), Prampram (GAR), Pamfokrom (CR), and Axim (WR).

Each RTC has residential accommodation, classroom, lecture room, kitchen and dining hall and toilet facilities. The average capacity of each centre for residential purposes is 40, with two persons to a room. But the intake could be increased by adding extra beds.

Water and electricity supply is generally available at all the centres. But there are often cuts in the supply. Some of the centres are also not well-equipped with adequate bedsteads, mattresses and writing tables and chairs.

Running courses at the RTC's for large numbers of people may often require buying water from GWSC water tankers, hiring extra mattresses and bedsteads. Pressure lamps and kerosene may also need to be provided to supplement electricity supply.

However, organizations wishing to use the RTC will need to contact the Regional Director of Community Development for the region where the RTC is located for detailed information about facilities and services available at each particular centre.

A modest fee is charged per person per room.

- Joshua Arthur, Acting Director DCD -

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With a field test kit a water can typically be sampled in the afternoon. After incubation overnight, the result can be obtained the following morning. This can be done anywhere in the field because the kit has its own rechargeable battery.

A microbiological field test kit can be relatively expensive because it not only requires a portable rechargeable battery but sophisticated electronics to maintain an accurate and stable incubation temperature. Hence, the cheapest known kit is not less than ¢500,00. Resupply of consumables will also be required for long term use of the kit. Although the cost of consumables may be relatively cheap their continuous supply may be problematic.

Jan Davis
OXFAM

• Appendix III

CONFERENCE ON RURAL WATER DELIVERY IN SUPPORT OF GHANA WATER AND SEWERAGE CORPORATION RURAL WATER DIVISION'S DEVELOPMENT PROGRAMME 1990. MOLE 2, 8-12TH MARCH 1990

A Model for Evaluation: Rural Water Programme[1]

Dr. Edwin Amonoo

1. INTRODUCTION

The International Drinking Water Supply and Sanitation Decade (IDWSSD) comes to an end this year. Its objectives have been the provision of good drinking water and improved sanitation for all. However, most developing countries, including Ghana, still have a long way to go to realise the decade's goals and objectives.

In the case of Ghana, present coverage of improved drinking water stands at 92% for urban and 42% for the rural sector. The urban and rural sanitation coverage is 60% and 15% respectively. The national water coverage based on a total population of 12.5m (1984) is 60% for water and 30% for sanitation.[2] These figures lead one to conclude that the rural water coverage is barely satisfactory. Although the gap issue is a major problem, another contributing factor which is perhaps more important is the poor state of existing rural water supply systems that constitute the 42% coverage. The high rate of defective boreholes of about 50% coverage in the mid 1980s especially in the southern and central parts of Ghana and rural pipe-borne systems is a reflection of a poor management of maintenance resources[3]. And this in effect means foregone resources for system expansion.

The level of coverage raises two basic concerns. The first refers to the existing rural water gap of 58%, while the second concern is raised by the less efficient use of resources. It can be argued further that the near absence of a monitoring and evaluation scheme for rural water supply in Ghana has in no small way contributed to the less than expected achievement of sector goals and objectives[4]. It is important that a sub-theme "Monitoring and Evaluation of Rural Water and Sanitation Programmes" has been included in the broad conference theme: "Rural Water in the Context of Child Survival".

This paper is an attempt to formulate a model for evaluating Rural Water Supply (RWS).

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1 The author wishes to express his profound gratitude to Honny, L.A., Mbir, K., Acheampong, I.K., Bentum, A.N., Tanko, M.H. and Blankson, G. for assisting in various ways in producing this paper.

2 Republic of Ghana, Report on the Water and Sanitation Conference, 23rd- 25th September, 1987, Accra, Ghana.

3 Source: Amonoo, E., 1989, Rural Water Development in Ghana, an address delivered at Mole 1, conference on Rural Water Delivery, WaterAid, July 13-17th, pp. 3-15.

4 Amonoo, E., "Small Communities Appropriate Water and Sanitation Programme". Study prepared for Peace Corps (Ghana) 1988, p.68, Centre for Development Studies, University of Cape Coast, Cape Coast, Ghana.

2. EVALUATION MODEL: RWS

2.1 Objectives of the Model

The model is designed to improve either directly or indirectly, the capabilities of interagencies including beneficiary communities in service delivery - water, sanitation and health projects at all planning levels - national, regional, district area and community. This major objective can be broken down into the following specific objectives:

(i) Firstly, it is to provide a consistent and logical framework for evaluation of rural water supply projects so as to serve as a corrective device and ensure sector growth and development. In other words, the model is a tool for re-examining project goals, objectives, inputs and outputs.

(ii) Secondly, it gives a schematic overview of the key elements and unit of measurement of indicator variables for the efficient management of rural water supply projects.

(iii) Thirdly, it contributes to the application of a well-known planning and evaluation tool - the logical framework matrix[1].

(iv) Fourthly, it helps with the tailoring of development initiatives to the actual or potential constraints of rural water delivery.

2.2 An Evaluation Framework

An evaluation framework based on the logical framework matrix indicating a set of relationships, sector goals, objectives, inputs, outputs and indicator variables is presented in table 1.

2.3 Assumptions of the Model

To formulate the model the following assumptions are made:

(i) There is the need for improved water.
(ii) The provision of potable water is through the construction of simple technological rural water options, that can be managed by the beneficiary community themselves.
(iii) Technical know-how is available.
(iv) Input supply for hard and software is available.
(v) There is a bench mark data to facilitate measurable indicators.

A concise form of the logical framework matrix is portrayed by Table 2 below.

Table 2: Project Target Indicator Variables

	X_{i1T}	X_{i2T}	X_{i3T}
Sector goal	X_{11T}	X_{12T}	X_{13T}
Objective	X_{21T}	X_{22T}	X_{23T}
Input	X_{31T}	X_{32T}	X_{33T}
Output	X_{41T}	X_{42T}	X_{43T}

Where X_{11T} - Target population covered by HDWs for sector goal achievement by 2001.
X_{12T} - Share of HDW in total HDWs in the District.
X_{13T} - Reduction in incidence (%) of water borne related diseases.
X_{21T} - Number benefitting from new improved water facility.
X_{22T} - HDWs constructed.
X_{23T} - Average distance from periphery.
X_{31T} - Number of animators and management committee.
X_{32T} - Target population who partake in the physical development of systems.
X_{33T} - Water point development cost per HDW.
X_{41T} - Target population animated.
X_{42T} - Community management committee.
X_{43T} - Per capita consumption of improved water.

Another table, 3 which is the realized project table with indicators X_{i1T}, X_{i2T}, X_{i3T} shows the empirical information obtained from a particular community at the end of the project period. This is shown as below:

Table 3: Realized Indicator Variables

	X_{i1R}	X_{i2R}	X_{i3R}
Sector goal	X_{11R}	X_{12R}	X_{13R}
Objective	X_{21R}	X_{22R}	X_{23R}
Input	X_{31R}	X_{32R}	X_{33R}
Output	X_{41R}	X_{42R}	X_{43R}

X_{i1R}, X_{i2R} etc are realized magnitudes of the variables defined earlier.

Table 4: Scaled Scores

	S_1	S_2	S_3
Sector goal	a	b	c
Objective	d	e	f
Input	g	h	i
Output	j	k	l

3. OUTCOMES

The sub-sector indicators for sector goal, objectives, input and output in the two tables (2) and (3) are compared, for example X_{11R} to X_{11T}, X_{12R} to X_{12T}, etc and these scaled accordingly by the criterion 1 for below average, 2, satisfactory and 3, above satisfactory. The satisfactory points were assumed to be the targeted values, as specified in Table 2. The scaled values are presented in Table 4 above, with sub-indicators S_1, S_2 and S_3. To determine actual performance of the programme, each of the sub-indicators S_1, S_2 and S_3 is taken as (4 x 1) matrix,

Where

$$S_1 = \begin{pmatrix} a \\ d \\ g \\ j \end{pmatrix} \quad S_2 = \begin{pmatrix} b \\ e \\ h \\ k \end{pmatrix} \quad S_3 = \begin{pmatrix} c \\ f \\ i \\ l \end{pmatrix}$$

and each element in each matrix takes a value ranging from 1 to 3. The performance matrix P is obtained by summing S_1, S_2, S_3; that is

$$S_1 + S_2 + S_3 = P$$

where

$$P = \begin{pmatrix} P_1 \\ P_2 \\ P_3 \\ p_4 \end{pmatrix}$$

and P_1, P_2, P_3, P_4 take values from 3 to 9

$$\Rightarrow \begin{pmatrix} a \\ d \\ g \\ j \end{pmatrix} + \begin{pmatrix} b \\ e \\ h \\ k \end{pmatrix} + \begin{pmatrix} c \\ f \\ i \\ l \end{pmatrix} = \begin{pmatrix} P_1 \\ P_2 \\ P_3 \\ P_4 \end{pmatrix}$$

4. APPLICATION

For the purpose of illustration, a hypothetical rural community named 'A' is among 8 target communities that are part a rural hand-dug well programme. The base year 1991 population of this community is 492 whilst the projected natural growth at the terminal year 2001 of the programme is 636. The provision of rural water supply is through the development of 10,000 HDWs. The programme (HDW) is expected to increase sector coverage from 0.42 to 0.75 in year 2001.

The case of community A is illustrated by applying the adapted logical framework as exemplified in Table 5. The specific assumptions underlying the illustration based on community A and others are presented below:

(i) Natural growth rate is 2.6% p.a.

(ii) 1 HDW satisfies the water needs of $\leq$275 peoples.

(iii) Base year water coverage is 42% and by the terminal year existing HDWs will be replaced.

(iv) 75% coverage.

Population change coverage and systems to be developed in the 8 targeted communities are highlighted in Table 6.

Where X_{11T} - Target population covered by HDWs for sector goal achievement by 2001.
X_{12T} - Share of HDW in total HDWs in the District.
X_{13T} - *Reduction in incidence (%) of water borne related diseases.*
X_{21T} - Number benefitting from new improved water facility.
X_{22T} - HDWs constructed.
X_{23T} - Average distance from periphery.
X_{31T} - Number of animators and management committee.
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	S_1	S_2	S_3
Sector goal	a	b	c
Objective	d	e	f
Input	g	h	i
Output	j	k	l

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The sub-sector indicators for sector goal, objectives, input and output in the two tables (2) and (3) are compared, for example X_{11R} to X_{11T}, X_{12R} to X_{12T}, etc and these scaled accordingly by the criterion 1 for below average, 2, satisfactory and 3, above satisfactory. The satisfactory points were assumed to be the targeted values, as specified in Table 2. The scaled values are presented in Table 4 above, with sub-indicators S_1, S_2 and S_3. To determine actual performance of the programme, each of the sub-indicators S_1, S_2 and S_3 is taken as (4 x 1) matrix,

Table 9: Scaled scores for Community 'A'

	S_1	S_2	S_3
Sector goal	1	2	1
Objective	1	2	2
Input	1	1	3
Output	1	2	1

The results portrayed in Table 9 are rearranged into three unit column matrices to obtain the actual performance of the programme.

That is:

$$P = \begin{pmatrix} 1 \\ 1 \\ \\ 1 \\ 1 \end{pmatrix} + \begin{pmatrix} 2 \\ 2 \\ \\ 1 \\ 2 \end{pmatrix} + \begin{pmatrix} 1 \\ 2 \\ \\ 3 \\ 1 \end{pmatrix} = \begin{pmatrix} 4 \\ 5 \\ \\ 5 \\ 4 \end{pmatrix}^{1}$$

1 This is result can also be obtained by simply adding the scaled scores horizontally in Table 9.

Table 6: Target Communities and Coverage

Comm-unity	Pop.*1 (1991)	Pop. by 2001	Change in pop.	42% of pop. covered in 1991	Total pop. to be covered by (2001)	HDWs to achieve 75% coverage *2
A	492	636	144	207	477	2
B	540	698	158	227	524	2
C	681	850	199	286	638	3
D	700	905	205	294	679	3
E	790	1021	231	332	766	3
F	850	1099	249	357	824	3
G	930	1202	272	391	970	4
H	1000	1293	293	420	970	4

*1 42% of population covered by RWS.
1 275 HDW and 90 HDWs/District.
2 Water point development cost is ¢0.8m/HDW.
*2 Assuming HDW existing in the base year (1991) are to be replaced totally by 2001.

Community A is taken from Table 6 for illustration. Using the definitions given in the projet Table 2, the project target indicator variables are indicated in Table 7 below:

Table 7: Project Target Indicator Variables for Community 'A'

	X_{i1T}	X_{i2T}	X_{i3T}
Sector goal	477	2/90	99%
Objective	335	2	200m
Input	7	477	¢0.8m
Output	509	5	3.3 gal

Assume the realized table at the end of the period 2001 is shown:

Table 8: Realized Indicator Variables for Community 'A'.

	X_{i1R}	X_{i2R}	X_{i3R}
Sector goal	400	0.02	.8
Objective	275	2	200m
Input	5	385	¢0.6m
Output	375	5	2.5 gal

From tables (7) and (8) the results are scaled to obtain the following scores in Table 9.

6 IMPLICATIONS OF THE MODEL

To implement this evaluation model requires that certain conditions should be met. In what follows, some of these conditions are highlighted.

(a) The need and use of accurate and reliable information as a resource for efficient project implementation is underscored.

(b) Interagency personnel should be given exposure in the art of evaluation design.

(c) Evaluation should be seen as a useful tool in helping to minimize expected and realized outcomes so as to achieve better use of scarce resources in the RWS sector.

(d) Adequate resources should be set aside for the development of evaluation units at different planning levels in the sector.

7 CONCLUSION

An evaluation model based on the logical framework matrix has been formulated and applied to the rural water supply sector. It has been demonstrated that the method is simple and feasible and can be used at all planning levels for the sector. Its usefulness is brought about through a process of thinking ahead - specification of components, criteria variables and expected results. This process minimizes project planning inconsistencies, thus contributing to better use of resources, and this can enhance the frontiers of growth and sustainability of the rural water sector during the second International Drinking Water Supply and Sanitation Decade, 1991 - 2001.

In spite of the usefulness of the logical framework matrix it is pertinent to caution its application, since it has certain setbacks. The scheduling of activities and the roles of those involved in implementation are not articulated. Therefore, it does not help to specify the timeliness of resources usage as provided, for example, by critical path and network analysis. Furthermore, the logical framework matrix does not offer a method for transforming the technical coefficients into outputs.

The results manifested in the matrix of outcome, P, show that the overall outcome of the HDW project in community A is below satisfactory.

However, expressing outcomes in terms of numerical values does not really help to capture causes or factors that might have contributed towards the attainment of outcomes. It is of great importance to explore these attributes through iteration to identify the causes underlining the poor performance. This will be done by matching outcome with original assumptions in the logical framework.

We will now discuss these factors:

(i) Output

(a) The yield of the aquifer was lower than expected. This affected per capita consumption, thereby affecting the achievement of the sector goal.

(b) Although the size composition of the 5-man management committee was realized, poor identification and specification of their roles and responsibilities within a programming context may have led to the achievement of lower scores.

(c) The percentage scores in terms of the number of people sensitized, animated and mobilized could not be achieved due to methods adopted in the community management of systems. Therefore replicability and sustainability of systems cannot be ensured except the above factors are mitigated or removed completely.

(ii) Input

The overall input score of 5 was less than satisfactory. This could be attributed to the low number of people animated (385). An explanation for this could be the conflicting time preference of the people, namely, community versus private interests. By implication, the result demonstrates that at the project formulation stage, the time preference function and allocation were underweighed.

(iii) Objectives

The project objective shows less than expected outcome. It is clear that 275 people benefited from the improved water point and this could be adduced from the following reasons viz:

(a) Though the expected HDWs were constructed, their low yield (2.5 gal per capita/HDW) reduced the responsiveness of the people in patronizing these systems.

(b) The queuing time was more than the acceptable limit and this affected the total number of people who patronized the new system.

(c) Intensity and type of approach of animation.

(iv) Sector Goal

The overall result is less than satisfactory, though the quality of life was raised this was lower than expected due to an underestimation of yields per HDW. The availability of technical know-how in quantitative terms was fulfilled, however, its qualitative aspect in terms of level of skill and know-how was also underestimated.

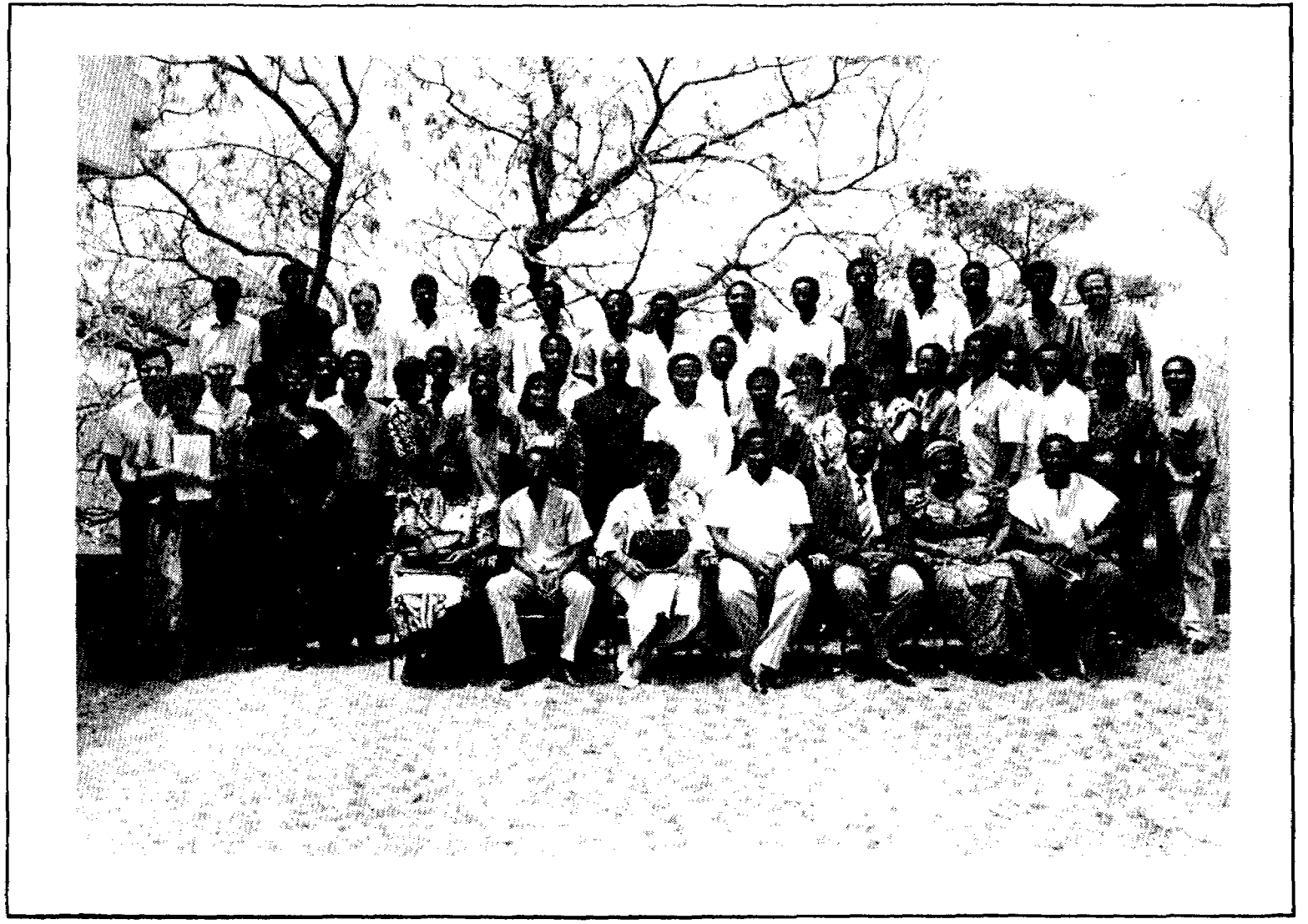
Table 5: Evaluation Framework: RWS - Community Level

Sectoral Goal	Objectively Verifiable Indicators	Assumptions
1. Improve quality of life through provision of potable water for all by 2001.	75% coverage.	Absence of potable water is likely to affect the quality of life.
2. Increase rural water coverage to Z%.	Δs in coverage between period ^{T}1991 to ^{T}2001.	
Objectives		
Provision of improved water for 75% of K million rural people through the construction of D HDWs by 2001.	About 250 - 300 people benefit from 1 HDW by 2001. 3.3 gal per capita.	Availability of underground water and technical know-how.
Input		
Software: (a) Creation of awareness, animation and action.	1. Acceptance and participation of the community in the development of software systems.	1. Availability of resources by interagencies and beneficiary communities in the development of systems.
Hardware: Construction of D HDWs by 2001.	2. Involvement of beneficiary communities in the development and construction of D HDWs.	2. Management capability by interagency and beneficiary communities.
Output		
1a N Number of people (6 yrs and above) animated as part of the national programme.	1. X million people relying on improved systems.	1. Willingness of the community to participate in development and management of maintenance.
1b Management of systems by the 7-man management committee.	2. Establishment of capable RWS committees capable of controlling and directing project activities.	2. Readiness to serve on the RWS management committee.
2. Provision of potable drinking water of reasonably tolerable quality of 3.3 gal per capita.	3. Adequate improved water - 3.3 gal per capita.	3a Adequate potable water to satisfy consumption, about 950 gal per HDW per day.
		3b Willingness and ability to pay towards development and maintenance of water system.

Table 1: Evaluation Framework: RWS

Narrative Summary	Goal	Objectives	Inputs	Output	Activities
National a) Policy b) Implementation	1. Improve quality of life through provision of potable water for all by 2001. 2. Increase rural water supply coverage to 75..	Provision of improved water for 75% of Qm rural people through the construction of A HDWs by 2001.	1. SOFTWARE: a. Creation of awareness, animation and action. b. Community management of systems. 2. HARDWARE: Construction of A HDWs by 2001.	1. 9.9m people animated in the national RWS programme. 2. Provision of potable water of reasonably tolerable quality of 3.3 gal per capita.	1. Sensitizing and animation. 2. Design preparation, construction, maintenance and repair.
Regional	1. Improve quality of life through provision of potable water for all by 2001. 2. Increase rural water supply coverage to X.	Provision of improved water for 75% of Rm rural people through the construction of B HDWs by 2001.	1. SOFTWARE: a. Creation of awareness, animation and action. b. Community management of systems. 2. HARDWARE: Construction of B HDWs by 2001.	1. Ym people animated in the national RWS programme. 2. Provision of potable water of reasonably tolerable quality of 3.3 gal. per capita.	1. Sensitizing and animation. 2. Design preparation, construction, maintenance and repair.
District	1. Improve quality of life through provision of potable water for all by 2001. 2. Increase rural water supply coverage to Y.	Provision of improved water for 75% of Tm rural people through the construction of C HDWs by 2001.	1. SOFTWARE: a. Creation of awareness, animation and action. b. Community management of systems. 2. HARDWARE: Construction of C HDWs by 2001.	1a Zm people animated in the national RWS programme. b. Management of systems by 4-man committee. 2. Provision of potable water of reasonably tolerable quality of 3.3 gal per capita.	1. Sensitizing and animation. 2. Design preparation, construction, maintenance and repair.
Community	1. Improve quality of life through provision of potable water for all by 2001. 2. Increase rural water supply coverage to Z.	Provision of improved water for 75% of Fm rural people through the construction of D HDWs by 2001.	1. SOFTWARE: a. Creation of awareness, animation and action. b. Community management of systems. 2. HARDWARE: Construction of D HDWs by 2001.	1a. N people animated in the national RWS programme. b. Management of systems by 7-man management team. 2. Provision of potable water of reasonably tolerable quality of 3.3 gal per capita.	1. Sensitizing and animation. 2. Design preparation, construction, maintenance and repairs.

Note:Table 1 is an adapted version of the "Logical Framework Matrix", Agency for International Development, Handbook 3, November 1989, USA.



PARTICIPANTS AT MOLE 2, WITH THE PNDC SECRETARY FOR THE NORTHERN REGION MR. JOHN BAWA