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ADDING GUINEA WORM
CONTROL COMPONENTS:
GUIDELINES FOR WATER
AND SANITATION PROJECTS



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Prepared for the Office of Health,
Bureau for Science and Technology,
U.S. Agency for International Development
under WASH Activity No. 368

by

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Chapter 1

INTRODUCTION: THE PROBLEM OF GUINEA WORM DISEASE

1.1 The "Add-On" Component Concept

In 1986, the World Health Assembly passed a resolution calling for elimination of guinea worm disease and brought the disease into the forefront of development issues. In 1987, the U.S. Congress held hearings on guinea worm disease and encouraged donor agencies to support control programs. The U.S. Agency for International Development (AID) responded to the congressional initiative by committing itself to ensure that a component on guinea worm disease control be added on to AID water projects already in place in countries or regions where guinea worm disease is endemic. (At present, water projects in guinea worm endemic countries may have general hygiene education programs, but this does not ensure that a component on guinea worm control is also present.)

The erroneous argument is often made by those with little practical experience in the field that by focusing on guinea worm affected communities one would be neglecting other more widespread and lethal diseases which are water related, such as typhoid or cholera. In fact, the reverse is true. Even in the most endemic countries only a small percentage of the villages are affected by guinea worm. Experience has shown that they are almost invariably the villages with the worst water sources by any measure--contaminated not only by guinea worm but also by a host of other pathogens, including those which critics claimed might be neglected by focusing on guinea worm. In many respects, the presence of guinea worm can be looked upon as a useful indicator for which villages should be on a priority list for clean water programs, regardless of the diseases one is targeting.

This report provides guidelines for adding a guinea worm component to existing large-scale national water and sanitation projects. It can also be applicable in other major projects dealing with community-level rural development, such as agricultural or educational projects. The guidelines are intended for use by project officers of private voluntary organizations and other donors in developing a guinea worm add-on component to their water and sanitation projects. The experience of the Togo Rural Water Supply Project provides the basis for the guidelines.

1.2 Background

Dracunculiasis or guinea worm disease affects an estimated 5 to 15 million persons per year, with 140 million people at risk in Africa, Asia, and the Middle East. Often referred to as the "forgotten disease of the forgotten people," guinea worm infects rural people who use contaminated water sources. Because the disease does not kill but only incapacitates its victims, many donor agencies have not paid much attention to it.

The disease is extremely easy to control. The vector, a small flea called "cyclops," is visible to the naked eye and can be filtered out of drinking water with a piece of cloth. In communities with clean, protected water supplies, where community members faithfully use the protected source for drinking water, the disease is virtually nonexistent. The relationship between polluted water sources and guinea worm disease is so close that the incidence of the disease can be used to test the success of water and sanitation projects in a given geographical area.

1.3 The Guinea Worm Disease Cycle

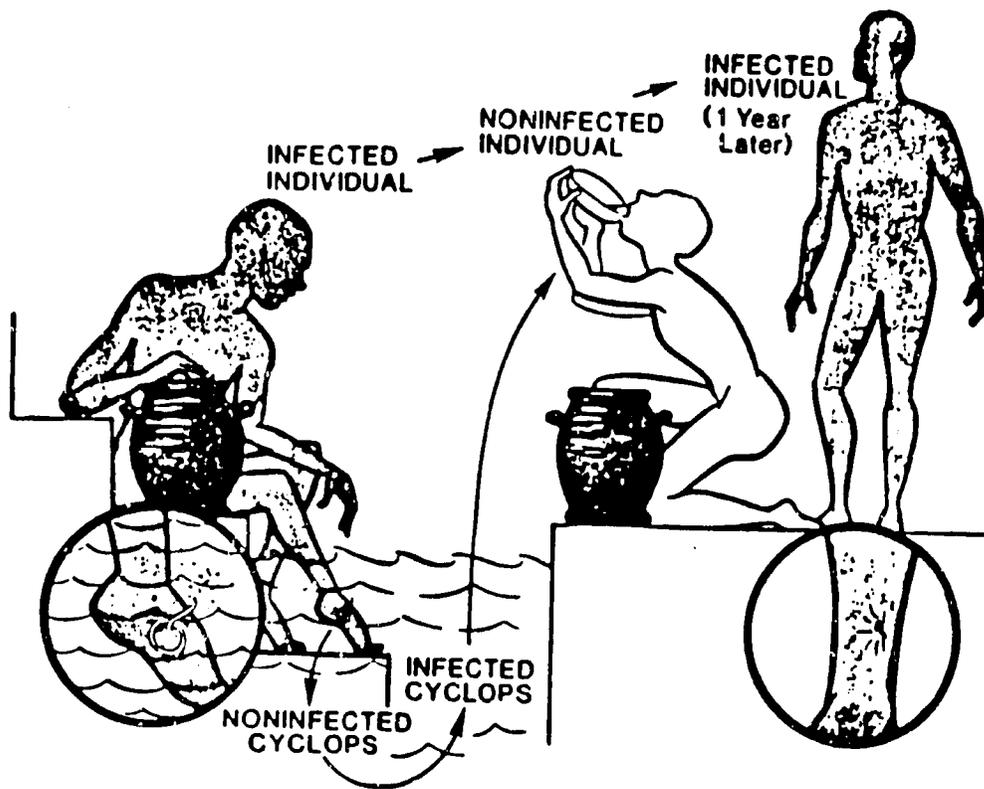


Figure 1. Life cycle of Dracunculus medinensis (Centers for Disease Control, 1981)

After an incubation or growing period of up to 12 months in the human host, the adult female worm moves to a position under the skin of the afflicted person. A painful blister appears, usually on the lower leg or foot. When the person puts the affected part of his body in water, the blister breaks and hundreds of thousands of tiny first-stage larvae are released into the water. The adult female worm then comes out slowly through the sore made by the broken blister. This worm is very thin but may be as long as one meter.

Some of the larvae in the water are eaten by the "cyclops," or water flea, where they live and develop into third-stage larvae. These third-stage larvae, living inside the water flea, pass on guinea worm infection to people. (The moving water fleas are barely visible if water containing them is held up to a light.) When people drink water containing the cyclops which carry the infective third-stage larvae, gastric juices in the stomach kill the cyclops and free the larvae. These larvae dig through the digestive tract and live in the abdomen. Male and female worms mate at three months and then the males die. The female continues to grow into an adult worm and moves toward the skin surface.

During the months-long incubation or growing period, people usually experience no symptoms of sickness. When the worm begins to come out, it usually takes several weeks to completely leave the body. During this time the person is disabled or in pain, often from infection of the sore from which the worm is leaving the body or from an abscess or arthritis. Tetanus can develop, as well as frozen joints and permanent crippling. (The worms do not survive in people for more than one year--they either come through the skin or die inside the body. Worms that die are absorbed and usually cause no symptoms.)

No matter how often people are infected or how many worms appear at the same time, people do not become immune to the guinea worm parasite.

1.4 The Impact of Guinea Worm Disease

Infection with guinea worm is an indicator of poverty. It occurs primarily in rural areas without a safe water supply. As is well known, during the agricultural seasons the disease incapacitates able farm workers for three months. However, its impact on mothers, and their capacity to care for infants and children, is somewhat less known. In some countries girls and women showed a higher incidence of infection than boys and men. This is possibly due to the women's greater exposure to contaminated water through agricultural and domestic activities. Preliminary focus group interviews conducted in Ibadan, Nigeria, reveal that the effects of the disease on pregnant women include loss of appetite, weakness, dizziness, and pains all over the body, accompanied by chills. The mother of a newborn is not able to move around and attend to the baby's needs. Breastfeeding is often stopped temporarily. What is worse, in some Yoruba areas in Nigeria women believe that the disease can be passed on to the child through the breastmilk. Hence, the child is prematurely taken off the breast and given formula. In guinea worm endemic areas, pupils missed up to 25 percent of the school year compared to 2.5 percent in the nonendemic area.

1.5 Guinea Worm Disease Control Strategies

Water and sanitation projects are, in themselves, the most efficient and effective control against guinea worm disease. But such projects must pay attention to how people utilize the project resources to improve their health. Even though clean water sources are provided, people may not always use them for drinking water. There are numerous reasons for this. The new source may be too far away, too crowded, too costly, or otherwise hard to get. It may not provide enough water or may not be placed on a site suitable for meeting

all water needs: bathing, washing clothes, etc. The water from the new source may have an unfamiliar color, odor, or taste. The new source may not have the sanction of religious or sociocultural traditions or may be controlled by a subgroup in the community. Also, when people visit friends or work in the fields, they may drink contaminated water. For these reasons, community education plays an active role in guinea worm control.

The World Health Organization (WHO) has officially endorsed a guinea worm control strategy which includes four major elements:

- 1) Surveillance of guinea worm disease to identify infected areas and villages and to monitor the impact of guinea worm control activities.
- 2) Designation of regions and villages where the disease is endemic as priority targets for the development of potable water sources.
- 3) Chemical control of cyclops in infected water sources.
- 4) Community health education.

These strategies can be combined in various ways depending on local circumstances.

1.6 The Program in Togo

An increasing number of developing countries are devising strategies aimed at the control or eradication of guinea worm disease. One of the most successful is Togo.

It is estimated that 19 of the 21 préfectures in Togo have guinea worm cases reported. Many donors are sponsoring separate projects to supply potable water throughout the country.

1.6.1 The Togo Rural Water Project

The USAID-sponsored Togo Rural Water Project, located in the two regions with high rates of guinea worm, was one of the most successful projects. It laid great emphasis on socio-health programs which developed the ability of villages and village-based organizations to solve problems and to use water and sanitation properly. As a result, most villages involved in the project report no guinea worm disease since the project's completion.

1.6.2 UNICEF/Togo Guinea Worm Program

UNICEF's experience in Togo's guinea worm program provides an excellent example of an approach taken by a large organization to develop a control program. Originally, UNICEF/Togo was approached by the Government of Togo to work with primary schools providing health education and teaching students to make water filters. After some consideration, UNICEF made the decision that primary schools should not be the focus of guinea worm activities. Children may be an important target group for behavioral change, but they do not impact on village-wide decisions regarding water use and hygiene behaviors. Instead, the village health committees were established as the focal point for village guinea worm activities.

One of the first steps taken in the project was the decentralization of the guinea worm activities from the ministerial level to the regional level. This was done by holding a four-day conference to discuss and plan a coordinated inter-service strategy to control guinea worm. All regional and prefectural service directors for health, sanitation, social services, and education were invited. Guinea worm topics discussed included etiology, transmission, vector control, methods of intervention, roles of the various services, collaboration between services, and base-line research to determine disease prevalence.

The immediate outcome of the conference was the establishment of a regional advisory group and prefectural working groups concerned with the implementation of guinea worm control activities. The conference was essential in opening the door to all of the project's field activities.

The criteria for selecting villages for the project included an increase in disease incidence (number of children and adults infected) over time, and village involvement in other development projects.

These villages were identified by asking primary school directors about the number of cases, the type of water sources in each village, whether the village had committees or were served by social services or permanent or itinerant agents.

Project staff identified other projects, including water projects, agricultural projects, and other development projects, with whom they could share resources. UNICEF was very clear that its primary input would be in the area of training.

After collecting the needed information, project staff developed a report on the needs and resources of communities. It soon became evident that field workers would be the most critical element for carrying out this program.

Each prefecture chief medical person was requested to appoint one person on his or her staff who would be prepared to work 80 percent of the time on a guinea worm program. Finally, two categories of people were trained to assist in guinea worm disease control--assistant hygienists and itinerant agents.

USAID provided transportation to the field workers in the form of gasoline and motorbikes. It thus became necessary to work within 35 km of the prefecture. The village cluster approach was used by the project for logistical reasons.

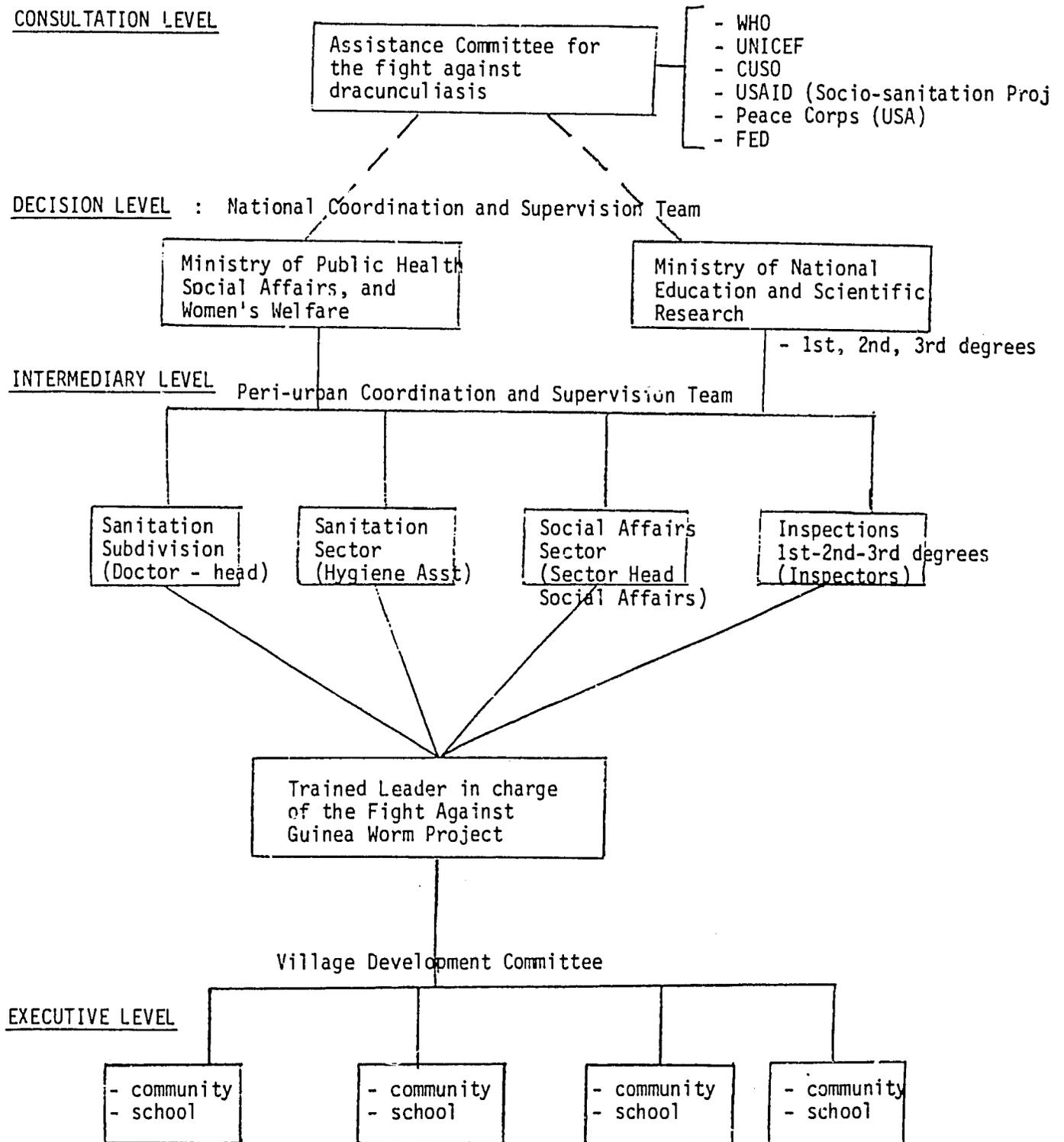
Once personnel were selected, the training began in the following stages.

1. The initial training of field health workers included extensive education about guinea worm disease, prevention, and treatment. During this training a working guide was developed for all field workers. This was a schedule of steps and activities to be taken by field workers in their respective project villages.
2. Another early area for training was teaching field staff how to manage their time and schedule their activities.
3. Next, field workers were taught how to help village health committees create projects that were truly the villages', rather than the field workers'; how to create health committees or re-vitalize non-functioning ones; and how to involve women.
4. Five months after village contact and activities had begun, schoolteachers were trained in guinea worm education. They developed practice lesson plans and activities and became aware of their role as village health educators.
5. Another area of training was for the village health volunteers. They were educated about the disease and trained to teach others about the transmission, prevention, and treatment of guinea worm. Special attention was given to health education techniques for illiterate adults, i.e., use of popular theater, story-telling, and graphic material.

The approach used by UNICEF/Togo was one that thoroughly assessed what the agency's and the project's resources were and integrated all health personnel at the community level.

Figure 2

Operational Intersectoral Coordination for Guinea Worm Control
Togo Project



Chapter 2

GUINEA WORM CONTROL ACTIVITIES

2.1 Types of Add-On Activities

The timing, order, and relative importance of interrelated guinea worm disease control strategies will vary according to the nature of the water supply and sanitation program intervention as well as the scope of existing guinea worm activities. In some cases, community-level activities to control the disease may precede and give impetus to water supply and sanitation activities. In other cases, water and sanitation programs may draw attention to the problem of guinea worm, or guinea worm disease control activities may be added onto existing program activities.

An example of the first scenario is a Togo World Neighbors program in the village of Kati, where villagers believed guinea worm to come from witchcraft. Water was not one of their felt needs. The program began its activities with a community-based health activities program which raised community awareness and inspired the village to take action against guinea worm. Volunteer health promoters were selected from the community and trained. Having recognized the causes of guinea worm, the community itself gathered funds to pay for drilling a well.

The USAID/FAC/FED program in Togo is an example of the second scenario. In this project, provision of water was the emphasis. However, through the project's socio-health program, the presence of guinea worm was one of the key indicators for beginning the water project and measuring health outcomes.

A third scenario is incorporating guinea worm control into a water and sanitation program from the first conception and design through final evaluation of the program. This is exemplified by the Canadian-funded CUSO (Canadian University Services Organization) rural water project, also in Togo, which was able to draw on the experiences and insights of both preceding projects.

Each of these three approaches represents a viable and potentially successful alternative to combining guinea worm disease control and water and sanitation programs. Each has potential advantages and disadvantages, but each requires similar activities by both the program staffs and by villagers.

Table 1 shows which guinea worm control activities should be undertaken at various phases of water and sanitation programs--from design through implementation.

Table 1
 Potential Guinea Worm Activities
 According to Phases of Water and Sanitation Programs

Phases of Water and Sanitation Programs	Guinea Worm Control Activities
1) Identifying target zones or villages for water projects (may be readjusted after step 5).	<ul style="list-style-type: none"> ● The presence of guinea worm is established as a criterion for the priority selection of target zones for water projects. ● The ministry of health and/or water and sanitation program administrators conduct a guinea worm distribution study. ● National strategy and policy regarding guinea worm control is clarified.
2) Deciding what types of interventions will be employed (could occur after step 5).	<ul style="list-style-type: none"> ● Specific plans are made for dealing with existing water sources contaminated with guinea worm (e.g., to be drained, chemically treated, used for alternate purposes, etc.). ● "Partners" or collaborators in guinea worm control activities are identified.
3) Gathering baseline data to be used later in evaluating the program.	<ul style="list-style-type: none"> ● Data on guinea worm prevalence, morbidity, impact, etc., are collected.
4) Training extension workers for community-level water and sanitation activities.	<ul style="list-style-type: none"> ● Guinea worm control is part of the training curriculum.
5) Making initial contact with the target communities (may result from community attempts to solve the guinea worm problem).	<ul style="list-style-type: none"> ● The community conducts a health problems assessment, which includes questions on the incidence of guinea worm disease. ● Discussions about how clean water supplies can solve the guinea worm problem serve as motivation for participation in water and sanitation activities.

Phases of
Water and Sanitation Programs

Guinea Worm Control Activities

- | | |
|--|--|
| 6) Installing new water sources. | ● The strategy for dealing with contaminated sources is implemented simultaneously. |
| 7) Establishing community-level organization responsible for maintaining the new water sources. | ● Appropriate guinea worm control activities are included in the scope of work and training for members of community-level organization: <ul style="list-style-type: none">- control of usage of contaminated sources,- managing chemical treatment,- reporting and monitoring cases of guinea worm disease,- referring afflicted persons for treatment, and- teaching personal prophylaxis and home care. |
| 8) Carrying out training/health education activities in how to use the new water source effectively. | ● Guinea worm control is included as a training activity (either starting from consciousness-raising or from a more advanced educational phase depending on prior guinea worm control activities in the project). |
| 9) Monitoring and evaluating the program. | ● Progress on wiping out guinea worm disease is included in the evaluation: <ul style="list-style-type: none">- case reporting/surveillance,- use of contaminated sources,- testing of treated sources, and- knowledge, attitudes, and practices regarding the disease. |

2.2 Step-by-Step Guide to Adding Guinea Worm Control Activities

The steps that need to be accomplished by water and sanitation program staff to add a guinea worm control component to either a new or ongoing water and sanitation program are described here. (Most of these steps would also need to be accomplished by personnel responsible for guinea worm control activities which would lead to water and sanitation projects, but this special situation will not be specifically dealt with here.)

2.2.1 Step One: Collect Information on Guinea Worm Control Efforts

Before any sensible strategy for adding on a guinea worm control component can be devised, water and sanitation program staff must find out what is being done or has been done to control guinea worm in the target country. The following questions should be answered:

- Is there a national strategy for guinea worm control? If so, what does it consist of? Has there been any attempt to implement the strategy, or is an attempt being planned? If so, what is being done and who is responsible?
- Is guinea worm a reportable disease in the country? If so, does the central office of health statistics have data on the distribution and incidence of guinea worm? On what are these data based? How reliable are they?
- Is the presence of guinea worm officially a criterion for the selection of villages in rural water development projects in the target country? If so, how do the planners of water projects determine that guinea worm is present? What definition of guinea worm infection is employed? (One case? Five percent of the population? Positive identification of a case or cases during the year of water project implementation? During the past two years? During the past five years?)

While this information is being gathered, project staff should establish a working agreement with responsible officials concerning guinea worm control strategies and approaches that may apply.

2.2.2 Step Two: Identify Interested Organizational Collaborators or Partners

A number of services, agencies, or individuals might be interested in collaborating in a guinea worm disease control program in the project zone or country. These should be identified. Possible organizational collaborators may include the ministry of health; the ministries concerned with rural

development, agriculture, water and sanitation, education, women's affairs, or rural programs; local non-governmental organizations; religious missions; bilateral donors; volunteer agencies or multilateral donors such as UNICEF (the U.N. Children's Fund), WHO, or the World Bank. At a local level, political representatives, clergy, schoolteachers, outreach extension workers, health services personnel, traditional leaders, youth and women's representatives, and hygiene or sanitation workers should be contacted.

2.2.3 Step Three: Form a Guinea Worm Task Force

After potential collaborators have been identified, it should be verified that they understand the causes and implications of guinea worm disease. Previous experiences with controlling guinea worm should be reviewed and lessons learned should be drawn from them. If possible a guinea worm task force should be formed. Such a task force can establish mutual roles and responsibilities, review available resources, and identify additional resource needs (human, financial, and material).

2.2.4 Step Four: Identify Guinea Worm Zones in the Project Area

A survey should be carried out to identify guinea worm zones and villages in the water and sanitation project area. This survey can be conducted as follows:

- Review existing literature about guinea worm disease in the target country.
- Identify and train, if necessary, those responsible for carrying out the survey.
- Conduct a rapid field survey of guinea worm sites by mail, by reviewing health center records, or by a village-by-village assessment.
- Visit guinea worm infected villages identified by the rapid survey and verify the existence of the disease.
- Visit villages in the vicinity of infected villages and verify the presence or absence of guinea worm disease.

2.2.5 Step Five: Assess the Scope of the Guinea Worm Problem

For the purpose of overall program planning and evaluation, the scope and impact of the guinea worm problem in the affected areas should be assessed. Appropriate baseline research should be carried out in a sub-sample of guinea worm-affected villages to establish levels of prevalence, morbidity, and impact and knowledge, attitudes, and practices concerning the disease. This research should be done in collaboration with village representatives and in

sample villages should be part of the consciousness-raising process, if possible. The data that results from the research may be used to determine the objectives, resource needs, scope, and duration of the program.

2.2.6 Step Six: Decide on a Strategy

This strategy should clearly outline the thrust of the program--community motivation, part of a government-sponsored project, chemical treatment, options for different technologies, etc. It should include a plan outlining all the steps, who will carry them out, and resources (including training) required to bring this strategy to fruition.

2.2.7 Step Seven: Train Personnel

Water and sanitation program personnel and certain of their colleagues should be trained in guinea worm control. Preliminary tasks for this step are deciding on strategies and approaches, developing appropriate training materials, and testing these in a small sample of villages. Based on experience with the actual training activity, the approach may need to be revised and personnel retained to obtain the best results.

2.2.8 Step Eight: Implement the Strategy

As the strategies are implemented, progress should be monitored closely, so that the approach can be adapted as necessary.

2.2.9 Step Nine: Evaluate the Impact of the Program

The evaluation of the project should take place at all levels. Program staff should identify intermediate activities leading to the community's ability to control the disease such as setting up a committee on guinea worm, participation of women in the committee, community awareness, and practice of filtering. Careful attention should be paid to the community's self-evaluation of the program. A water/guinea worm program can be very empowering to a village and may be the stepping stone to other village health activities.

At the governmental level, an important evaluative indicator is the government's continued commitment to the program in other regions. An indicator here might be allocation of a guinea worm line item in the health budget.

2.3 Constraints on Add-On Activities

2.3.1 Program and Personnel Constraints

Governments and donor agencies often assume that it is simple and easy to add a new component to a project. It is often argued that since village leaders, health workers, and other community-based workers are already carrying out health-related activities, one additional activity will not affect their regularly scheduled work load.

Experience from various projects in which components were added on shows that the following challenges were encountered:

- The need to clearly define responsibilities according to the level and capability of field workers:
 - Village leaders can have responsibilities that directly affect household sanitation and well maintenance.
 - Village health workers may be given responsibilities in more complex tasks such as growth monitoring, nutrition education, drug dispensing, chemical treatment of water sources, and treatment of guinea worm wounds.
 - Extension agents can function as trainers, facilitators, supervisors, and trouble-shooters for village-level guinea worm activities.
 - Higher-level officials can assume responsibility for setting strategy and making policy decisions, as well as for training and supervision of field workers.
- The need for project staff to be aware of how much people at different levels are capable of doing, given their work loads, training, mobility, and motivation.
- Sometimes providing additional skills to an inappropriate level of people or not providing sufficient preparation can do more harm than good. If their training is not well thought out, some categories of community health workers may think that the new skills they have been given make them quasi-physicians. Such an assumption can sometimes prompt such staff people to provide community members with drugs and/or injections.
- Some add-on components might involve adding new staff. The integration of the new staff with old is critical. Resentments may arise between old and new staff because new staff may have received added training or remuneration. One way this challenge can be overcome is to involve some of the stronger old animateurs in the training of new workers and their co-workers in new skill areas.
- Before embarking on an add-on project, project planners should decide who needs additional training and how the training will be handled.

- An add-on component should not be identified as a separate project or the implementing agency as separate from the main project agency, for the result is confusion of project identification. This is particularly important at the field level but might be less important at the national level.

2.3.2 Behavioral Constraints

As mentioned in Section 1.5, for numerous reasons, people may not always use the noncontaminated sources of drinking water available to them. While provision of safe drinking water sources is the most effective way to assure that people drink noninfected water, they may not always use the new water sources for drinking water. Their reasons for preferring the old contaminated sources must be taken into consideration when planning any control program.

2.3.3 Technical Constraints

In addition to personal preference reasons, people may revert to the old water sources because the new ones are over-extended (if the population increases), or the system (i.e. pump) may break down temporarily or permanently, forcing people to return to their old contaminated sources. Sometimes new or improved sources of drinking water become re-contaminated with guinea worm.

Some villages may be in geographical areas where the construction of improved water sources is very difficult due to geological or climatic circumstances. In other words, there may be no spring to tap, the village may be so far from a main road that it is difficult to bring in well-drilling equipment, the composition of the ground may make well-digging impossible, and so on.

Under circumstances such as described above, filtering may be the most viable alternative for prevention and control. If this is the case, then a program to manufacture and distribute the filter will be necessary. (See Brieger et al. 1986 on social marketing of filters in Idere. In this report, the authors outline the design of the filters, the cost, and the marketing strategy. See Appendix C for article.)

2.4 Preconditions for an Add-On Program

- One project staff member with interest and time to take overall responsibility for guinea worm control activities. This should include a "contract," an exact job description, for the water program staff member who will be in charge of the guinea worm activities. This is to ensure a clear understanding on the part of both the host country and project staff as to the coordinator's responsibilities.

Agents and other field health workers should also be given an exact job description so it is clearly understood what their responsibilities are and how much of their time the guinea worm activities will take.

- Existing village-level structure/organization to deal with health or other local problems, e.g.,
 - Community Health Committee
 - Community Water Committee
 - Community Development Committee
 - Community Health Worker
 - Primary School/Religious-Church/Health Center staff that are motivated and respected
 - Government Extension Agent residing in or regularly visiting village
 - Agricultural Cooperative
 - Traditional Council
 - Women's group, etc.

- Existing liaison structure between project and village-level organizations (must be mobile), e.g.
 - Project Extension Agents
 - Government Service Extension Services (Social Services, Agriculture, Water Services, etc.)
 - Missions/Peace Corps/NGOs etc.
 - Mobile Health Services Personnel
 - Schoolteachers Associations

Chapter 3

COMMUNITY HEALTH EDUCATION AND GUINEA WORM DISEASE CONTROL

Community health education is the key to the long-term success of any guinea worm control strategy. No technological "solutions" can be expected to succeed without concurrent educational interventions.

3.1 Characteristics of Effective Community Education

The content, emphasis, and target groups for guinea worm educational activities will vary according to specific circumstances of the affected community. The educational process must have certain characteristics, however, to be effective in any community.

- It should be active rather than passive. The target population should participate, take responsibility, guide, direct, evaluate, and generally contribute to the educational process rather than merely serve as recipients of information.
- It should be legitimate in the eyes of the community. Training and education should be carried out by educators who are trusted and respected. The concepts, beliefs, and perceptions used should be ones the community finds believable and acceptable. The process should result in a plan of action, devised by community members, that can be carried out with available resources.
- It should bring about sustainable change. Training and education should change behavior as a result of changes in attitudes and beliefs. A change in passive knowledge is not enough.
- It should weave a net of messages into which nearly everyone is caught. Community leaders, both traditional and modern, government representatives, and other people likely to lead community opinion must be convinced that the proposed strategies are legitimate and desirable. Specific messages, methods, and communication techniques should be directed at different groups in the community: men, women, children, elders, youth, etc.
- It should emphasize problem solving, focusing on what can be done rather than on prohibitions. "DO" should be the focus of discussion, rather than "DON'T."

- It should be flexible, constantly evaluated and readapted to reflect the needs and interests of the community. The priorities, interests, opportunities, and needs of the community may change over time, and, if they do, the educational activities should change also. The process must assure regular opportunities for feedback and review, thus keeping a check on the "pulse" of the community. Also, the process must take into account and adapt to other responsibilities, needs, and commitments of community members that may conflict with education and training.
- It should provide tangible, visible rewards for community efforts, both short and long term. Initial activities should lead quickly to specific progress, while at the same time building momentum for a more long-term effort. Short-duration activities will provide learning opportunities for management and organizational skills necessary to sustain a true control program. Initial activities should focus on projects perceived to be most important by the target population rather than those desired by the "educators."

3.2 Content of Community Education Activities

Five general content areas can be identified for community education in guinea worm control: raising consciousness about the impact of guinea worm, avoiding guinea worm (prevention), treating (or managing) guinea worm infections, reporting guinea worm, and organization and management of guinea worm control activities.

In any program, activities should be aimed at (1) enhancing the ability of the community to tackle the problem of guinea worm for the community as a whole (2) helping the individual to maintain personal and family health and welfare in a community whose sources of drinking water are infected with guinea worm, and (3) mobilizing the community to ultimately explore technological solutions to their community water resources.

Table 2 lists the possible subjects to be covered in all five subject areas for both the community and individual or family level.

Table 2

Community Education Activities for Guinea Worm Control

	<u>Community Level</u>	<u>Individual or Family Level</u>
<u>Consciousness Raising</u>	Community members identify causes of guinea worm as water related.	Same.
<u>Prevention</u>	<ul style="list-style-type: none"> ● Causes and transmission. ● Avoiding contamination of water sources: building platforms for water users counseling guinea worm patients to avoid submerging their wounds, preventing children from playing or bathing in drinking-water sources, controlling cyclops populations. ● Avoiding drinking from contaminated water sources: regulating sources, creating alternate sources, personal prophylaxis (filtering, boiling, or treating contaminated waters). 	<ul style="list-style-type: none"> ● Sterilizing contaminated water: filtering with cloth or special filters or through sand and charcoal, boiling or sterilizing with solar heat. ● Selecting non-contaminated water for drinking. ● Avoiding drinking contaminated water away from home.
<u>Treatment</u>	<ul style="list-style-type: none"> ● Identifying people with guinea worm. ● Contacting medical professionals for treatment. ● Teaching home care of guinea worm: covering the wound, preventing infection, getting a tetanus shot. ● Helping guinea worm patients to manage their basic economic activities. 	<ul style="list-style-type: none"> ● Cleaning the wound, preventing infection, and tightly covering the wound. ● Preventing tetanus ● Removing the worm ● Lessening the physical discomfort ● Avoiding further contamination of the water source.

Community Level

Individual or Family Level

Reporting

- Conducting a house-to-house survey to describe the importance of guinea worm disease in the community (how many have had it, what effect did it have on their families, how did it affect their own lives, etc.?)
- Keeping track of new cases.
- Reporting information about guinea worm to appropriate personnel.

- Explaining who to report the disease to and why.

Organization & Management

- Organizing to reduce the impact of guinea worm disease on the community (for example, organizing to help neighbors who have the disease).
- Organizing to manage a potable water source: choosing the technology and the site, collecting and managing money, organizing work parties, planning work steps, purchasing and storing supplies.
- Organizing to maintain a water system: discussing the advantages and disadvantages of various options with the people, controlling use of community water sources.
- Organizing to assure effective chemical treatment of infected water supplies: purchasing and storing chemicals, calculating dosages and timing of chemical treatment, discussing the advantages and disadvantages of chemical treatment with the people, monitoring the effectiveness of water treatment.

- Organizing household work to minimize the burden of disease on the family.
- Participating in community meetings about guinea worm.
- Getting around with guinea worm.

Community Level

Individual or Family Level

Organization
& Management
(continued)

- Organizing meetings: running a meeting, decision-making, keeping records, etc.
- Working with neighboring communities to prevent re-contamination of local water sources or infection of local people from other sources.

Chapter 4

INVOLVING THE COMMUNITY IN GUINEA WORM DISEASE CONTROL

To control guinea worm effectively, target communities must participate in the process of eradication. The degree of participation, as well as its nature, may vary according to local circumstances, but active community participation is most likely to occur and to lead to significant results if the community is helped to move through a number of phases from mobilization to implementation. The process of involving the community can be described as three phases.

Phase I

- Recognition that guinea worm disease is an important problem and
- Accepting responsibility for its resolution

Phase II

- Identification of appropriate solutions and
- Clarifying community responsibilities

Phase III

- Preparing to take charge of guinea worm control activities and
- Sustaining the effort, evaluation, and completion (including community monitoring).

4.1 Phase I: The Recognition/Acceptance Phase

Before a community can even begin to address the guinea worm problem it must recognize that guinea worm is a health problem which has substantial negative effects on overall community welfare. (At the very least, individuals and families must recognize that this disease constitutes a serious problem for them personally and that its resolution would contribute significantly to the improvement of their lives.) Further, the community must recognize that guinea worm disease is linked to water and water usage and that only by changing their own behavior can the disease be overcome. Community members must change the way they use existing water supplies and/or develop alternative water sources. Finally, the community must believe that the resolution of this disease problem is within their abilities and resources (resources both in the community and outside to which they might have access). They must believe that the cost, time, materials, energy, and financial outlays needed to resolve the problem will be worth it, and that there are no more cost-effective solutions available to them. For example, they must be convinced that no one else will be willing to take on the burden of guinea worm control in their behalf in the foreseeable future.

The recognition/acceptance phase of a guinea worm control project can occur either prior to the initiation of water and sanitation activities, in which instance the development of alternate water resources may become one of the solutions to the guinea worm problem, or within the context of an ongoing water and sanitation project. In the latter situation, guinea worm control activities can give further weight and validity to water and sanitation activities, while putting increased emphasis on effective water resources management and usage to improve health. In either case, the "recognition/acceptance" phase is a precondition for any successful guinea worm control project. Until the community recognizes guinea worm as an important problem, recognizes its ability to "do something" about the problem, and accepts its responsibility to take charge of resolving the problem, guinea worm control efforts are doomed, if not to total failure, certainly to limited success. However, it is an advantage that guinea worm is a relatively recognizable disease. Results of a successful control program are obvious.

4.1.1 Step One: Recognizing That Guinea Worm Is a Problem

Factors Affecting Community Recognition

How difficult it is for the community (and/or family) to recognize guinea worm as a problem worthy of attention will depend largely on the real or perceived importance of guinea worm in the community. How important the community sees this disease depends on a number of factors including:

- The percentage of the adult population that suffers from or has suffered from guinea worm disease. If the incidence of guinea worm disease is very high, it is more likely that the community will feel that guinea worm is a major problem.
- Other problems that affect the health and welfare of the community. These other problems may have a greater or lesser effect than guinea worm. It may be that in reality or in the perception of the people-- and this will depend to some extent on local beliefs, values, ambitions, interests, opportunities, etc.-- other problems are more important and urgent than guinea worm disease. For example, if many children are dying from malnutrition, malaria, or diarrhea, the people may believe that these problems are more important than a disease that mainly affects adults and is, after all, not deadly. Or, if many adults are not fully employed, the people may feel that the loss of a few weeks or months of work time for those who have guinea worm is a personal misfortune but not really a serious problem. Or, if it is easy for people to leave the community to find a life and livelihood elsewhere, they may not be concerned with solving the problem of guinea worm for those who stay behind.

- The socioeconomic classes that are affected by guinea worm. If both rich and poor, powerful and disenfranchised, indigenous and immigrant classes are affected, the problem may be perceived as more important than if it affects primarily those who are poorer, less powerful, or non-native to the community.
- If guinea worm is a recently acquired disease, one which the community has acquired through immigrants, there is usually an urgent willingness to do something.

Step One: Acceptance of the Problem

For a community to accept that guinea worm is an important problem, it must be convinced that:

- The people who suffer from guinea worm are important and necessary members of the community.
- The consequences of guinea worm disease have a serious effect on the community's welfare.
- In comparison to other problems the community faces, the consequences of guinea worm are as serious or more so.

Outside Help in Assessing the Importance of Guinea Worm

Some communities may come to view guinea worm disease as an important problem on their own; in other communities, an outsider can often help by providing new observations and analysis. However, even after this new observation and analysis, the community may decide that guinea worm is not a priority problem for them at this time. In this case, the outsider may have to abandon or reduce his or her efforts until the situation has changed.

How can an outsider assist a community in re-evaluating the problem of guinea worm? Several methods could be used either singly or in combination.

A Study of the Prevalence of Guinea Worm Disease

A study of the prevalence of guinea worm in the community can be conducted by outsiders and the results presented to the community. A more convincing and effective method is for members of the community to participate in or to conduct the study themselves. The study can be carried out by a village health committee, a village health worker, a group of school children, a women's group, a youth group, a political organization, a group of elders, the staff of a health center located in the community, or any other local group. The study need not be a perfect scientific, statistically valid description of guinea worm disease in the community, although, if this is possible, it may be

useful to the ministry of health or other professionals. Instead, the study should gather information that will allow the community to judge whether guinea worm disease is or is not an important problem for them.

To be useful in this way the study should have the following characteristics:

- It should cover enough households to be convincing. The community should decide whether this means all households or every tenth household or something in between.
- It should not take too much time to carry out or to analyze. The results should be available in a few weeks.
- Questionnaires or other study instruments should be simple and easily understandable to those carrying it out as well as those participating in it. This means that if few people in the community can read and write, the questionnaires should be visual rather than written. If a written questionnaire is appropriate, the language used should be simple and easily understandable. In either case, only a few questions should be asked.
- It should gather information about how many people in the community have suffered from guinea worm in the last year and about who these people are. (Are they men, women, adults, children, farmers, mechanics, teachers, employed, unemployed?) The best time to do the study is when a lot of people are suffering from guinea worm--during the guinea worm season. In addition, information about the consequences of the disease should be gathered (pain, medical costs, inability to work, lost revenue, family problems, etc.).

The people who carry out and analyze the study should be respected and trusted. There should be more than one of them and they should have access to households and to the community as a whole. In other words, people should be willing to answer their questions and to participate in meetings to listen to explanations of the study when this is necessary.

Before starting the study, water and sanitation personnel should seek to interest people in the study by talking to community leaders or holding a community meeting. Then the study should be designed. This involves deciding what information is needed and what questions should be asked to gather that information; designing and testing the study instrument or questionnaire; training the people who are going to gather the information; and identifying which households are going to be visited. (If not all households are included, a way must be devised to select a random sample--every third house, all the houses in a straight line, etc.).

The days and times of the study should be announced in advance so that people will be home. Also, it is important to let the community know what to expect and be sure they agree to participate. Once the study has been completed, the results should be discussed with the community.

Discussion of the Problem of Guinea Worm with the Community

Discussion of guinea worm with the community can continue through many meetings and over a long period of time. Various groups may take part in this discussion at different times. The study described above may be carried out during some phase of the discussions, or, in certain circumstances, it may be decided that a study is not necessary. The following descriptions suggest ways that guinea worm might be discussed with a community. Other approaches may be possible or better in specific circumstances. The purpose of all these discussions is to help the community understand and analyze how guinea worm disease affects their lives so that they can decide whether or not it is a problem worth doing something about.

The initial discussion should verify that people know what guinea worm disease is so that, when an outsider talks about guinea worm, the community understands which disease is being discussed. A good way to initiate such a discussion is to show photographs of people with guinea worm and then ask various questions: What is the disease? How is it experienced or recognized by people who have it? Is it common in the community? Has the pattern of the disease changed over time? What is it called in the local language?

Once a common understanding has been reached about the disease, discussion can progress to the impact of the disease on the welfare of the community. In a group meeting, individuals can recount their personal experiences with the disease. These discussions can be stimulated or focused using a variety of discussion techniques: questions and answers, role playing or community theater, open-ended stories, and visual materials that can be used to describe the impact of guinea worm on family or community life (flexi-flans, unserialized pictures, photographs, etc.). These discussions might lead to a decision to conduct a community survey like the one described above.

One goal of the discussions is to analyze the importance of guinea worm relative to other community problems and priorities. Thus, guinea worm disease is placed in the context of the overall situation of the community: its problems, priorities, expectations, needs, opportunities, and interests. The relative importance of guinea worm is discussed in relation not only to other health problems but also to many major social, economic, organizational, cultural, and resource concerns of the community as well. The community must decide if it should put its energies into resolving guinea worm or some other major concern. It must try to predict the outcome of a guinea worm disease control effort. Would that reduce other problems or create new opportunities for greater welfare? Will solving the guinea worm problem bring the community closer to what its members want it to be like in the future? These issues need to be addressed to reduce some of the constraints and increase commitment to effective guinea worm control, if this is appropriate. Much discussion may be necessary to attain a satisfactory consensus on these questions. Discussion can again be focused and encouraged through the range of techniques mentioned above.

Teaching the Community about Guinea Worm

Teaching the community about guinea worm is the most commonly employed method of raising community awareness about the problem of guinea worm. A local or an outside "expert" organizes meetings to instruct the people about the importance of this disease for their health and welfare. The effects of the infection on the health, wealth, welfare, and productivity of the individual, family, or community are presented or discussed. This method will probably be most effective in communities where a certain level of sensitivity to the problems created by guinea worm already exists because of the high prevalence rates or a relatively lesser burden of other problems. However, for greatest potential impact, such teaching should be combined with some information-seeking from the community and some mutual analysis of the level of impact of the disease on each particular community--all the more so if there appears to be no spontaneous recognition of the problem by the community at the outset.

4.1.2 Step Two: Recognizing That the Problem Can Be Resolved by the Community

Factors Affecting Community Recognition of Its Potential

The readiness of a community to believe that, through its own efforts, it can have a significant positive effect on the problem of guinea worm depends on numerous factors including:

- The degree to which it believes that the perceived causes of the problem can be affected by human intervention. As long as people are convinced that guinea worm disease is an act of God, it is unlikely that they will be convinced that human intervention can make a significant impact, or at least that the interventions recommended by the scientific community will make an impact on the problem.
- The extent to which the community has successfully tackled similar types of problems in the past. If a community has successfully addressed other problems, especially other health problems, it is more likely to believe that guinea worm can be controlled or eliminated through community action. Successful past interventions build confidence in the ability of the community, in the sufficiency of resources, and in existing organizational capacity.
- The extent to which the community perceives that its own resources can have an impact on the perceived causes of guinea worm disease. Community members might understand that guinea worm disease is caused by contaminated water, but they may not believe that they can do anything to assure that they have access to water that is not contaminated. So they will continue

to live with the problem. Or, the people might believe that the only solution to guinea worm is better medical care (the cause of the problem of guinea worm is perceived to be lack of adequate medical care). Since they do not have access to health services, they may believe that they can do nothing to reduce the guinea worm problem.

Step Two: Belief that the Community Can Solve the Problem

In order for a community to believe that guinea worm is a problem which can be wholly or partially resolved through the efforts of the community, it must:

1. Be convinced that guinea worm is a problem that will respond to appropriate human intervention.
2. Believe that the community has access to adequate resources to affect the causes of the problem.
3. Believe that the community has the capacity to use existing resources to resolve the problem.

Outside Help in Recognizing the Potential of the Community

Some communities may have little difficulty believing that, if they knew how and with their own resources, they could resolve at least partially the problem of guinea worm. For others, this belief may be more difficult. What can an outsider do to assist communities in recognizing their own potential to deal with this health problem? The following activities may be useful:

Linking Guinea Worm Infection to Contaminated Water Sources

Most communities have extensive and detailed belief systems concerning the causes of disease. These explanations may include supernatural causes as well as physical ones. In terms of current scientific knowledge, many are wholly false, but some contain elements of "truth"--the fruit of long experience. In order for a community to undertake an effective guinea worm control project, it is not necessary for it to accept a complete and accurate scientific explanation of the causes of guinea worm, but it must understand that guinea worm disease is caused by drinking contaminated water and that people with the disease should avoid contact with a source of drinking water.

The link between water and guinea worm can be established in a number of ways.

- Any existing belief concerning the role of water in causing guinea worm disease should be reinforced.

- It can be demonstrated, through site visits, through guest lectures (by people from other villages who have successfully lessened guinea worm disease in their communities), or through the personal experiences of some community members, that in villages which use clean drinking water, guinea worm has been reduced or eliminated.
- Contamination can be illustrated by allowing people to look at their contaminated water through a magnifying glass or microscope. A demonstration with hot pepper can be carried out: even after it has been rubbed off one's finger and is no longer visible, it will still sting the eye.
- Health care workers can be invited to explain the link between water and guinea worm disease.
- The process of contamination can be demonstrated by asking a person with a new guinea worm sore to put his or her foot (with the sore) in a bucket of clean water. A cloud of larvae will spurt out of the wound.

Before starting the discussions and teaching about water and guinea worm disease, the community's own beliefs about the causes of the disease should be investigated and discussed. These beliefs should be respected and, if possible, included in the explanations given by outsiders. Beliefs that are harmful to the understanding and acceptance of the link between guinea worm disease and water should not be ridiculed but should be counteracted by positive demonstrations that water is the most important source of the disease.

This process of discovery is likely to be long and slow; it will involve information exchange, observation, and testing. It should be pointed out that it takes about a year for the infection to show up as an adult worm and sore. Therefore, even after a guinea worm control program has started, some people will continue to get guinea worm disease--because they were infected before the program began, or, perhaps, because they became infected from another source.

4.2 Phase II: Possible Solutions and Community Responsibilities

4.2.1 Step Three: Discussing Alternative Approaches to Dealing Effectively with Contaminated Water

Once the community is convinced that drinking contaminated water is a major cause of guinea worm disease (even though belief in other causes may persist), discussions should focus on how to avoid drinking contaminated water. It should be recognized that both community members and outsiders will have valuable ideas to contribute regarding possible alternatives to contaminated

water. A final strategy may combine several alternatives (not all of which may be considered effective by the scientific community). Supernatural activities, which may increase the confidence of the population, may be combined with chemical treatment, for example, and produce a desired outcome as far as both villagers and experts are concerned.

There are three basic alternatives to contaminated water. First, a different source may be found. A well may be dug, a spring improved, a rainwater harvesting system devised, or a piped water system installed. People may carry clean water from home to the fields or on visits or may drink teas or bottled drinks when away from home.

The second alternative is to treat the sources of contaminated water with chemicals or to protect the water supply from guinea worm disease patients. This may be accomplished by building platforms so that people do not enter the water when filling their bucket or receptacle or that water splashed on people doesn't reenter and contaminate the source. Also, friends and neighbors can collect water for guinea worm sufferers.

The third alternative is for individuals or families to treat the contaminated water at home. The water can be boiled, filtered, or purified with sunlight.

Discussing Community Capacity for Mobilizing Resources

Simply knowing that adequate and appropriate resources are available and partially accessible may not be enough to convince a community that it has the ability to tackle the problem of guinea worm. A community may not have confidence in its own organizational capacity because it may never have attempted to resolve a similar problem or may have had a negative experience in trying to solve a similar problem. It may be that the community does not perceive clearly what needs to be done to obtain access to available resources or to use them appropriately. ("We don't know enough--we don't have the necessary expertise." "Why would outsiders select our community to help rather than someone else?" "We don't have enough power.")

Discussions concerning the mobilization of resources to resolve the problem of guinea worm need to include the following elements:

- What previous experiences has the community had in resolving its own problems? What was the outcome? What worked well? What were the problems? What was learned?
- What does the community need to do to tackle guinea worm control? These steps should be included in the discussion: organization, division of responsibilities and coordination; information gathering; teaching, demonstration, and convincing; contacting outside resources; and mobilizing and managing finances and materials.

- How are these tasks to be accomplished? Who will do them? How much time will it take? How much will it cost?

At this stage of project development, the discussions should be general. More detailed planning will occur later. The purpose of these initial discussions is to allow the community to re-evaluate its own capacities and abilities in relation to solving the problems of guinea worm disease. The discussions can be made more concrete through the use of analytical tools such as simple charts linking resource needs with available resources (What do we need? What is available? How can we get it or use it?). open-ended stories which address the problem of community organization, visual materials which allow the community to explore different ways to organize for action, and so forth.

Step Three: Identification of Solutions

Once convinced that contamination is the source of guinea worm disease, a community should examine various approaches, including:

1. A new or improved source of water, free of guinea worm
2. Treatment of the existing source
3. Filtering
4. Treatment of water at home by boiling, or purification with sunlight.

4.2.2 Step Four: Accepting Responsibility for Implementing Guinea Worm Disease Control Activities

A community will accept responsibility for guinea worm disease control activities only if it is convinced of the importance of the problem and believes it has access to sufficient resources to respond adequately to the problem. Even if some of these resources come from outside the community, overall management and appropriate use of the interventions will remain a community responsibility.

To tackle these responsibilities the community will, at a minimum, have to:

- designate individuals to oversee and carry out necessary tasks,
- find appropriate storage space for commodities (spare parts for pumps, chemicals for water treatment, health education materials, etc.),

- plan a feasible distribution system for necessary commodities,
- set aside time for meetings and health education activities, and
- agree on mechanisms to collect and manage the necessary financial contributions from the population.

All of these commitments need not be made simultaneously, but their implications for the community should be discussed early in the process of community motivation and consciousness-raising. Because these commitments represent the cost of guinea worm disease control to the community, they should be evaluated in terms of the expected benefits. The community's readiness to resolve the guinea worm problem can be gauged by the extent to which it actually and specifically lives up to its commitments.

Step Four: Accepting Responsibility for the
Guinea Worm Control Activity

Although some resources may come from outside the community, the community should be involved in

1. Day-to-day management of the activities, with individuals identified as key players in the program (health education, pump maintenance or repair, etc.)
2. Determining that adequate physical resources are available to undertake and sustain the activity (spare parts, equipment needs, storage space)
3. Organization of a water committee, repair financing, monitoring for continued community awareness of surveillance or protection to avoid recontamination.

4.3 Phase III: Taking Charge of Activities and Sustaining the Effort

4.3.1 Step Five: Preparing to Take Charge of Guinea Worm Control Activities

Identification of Solutions Phase

The specific components of a guinea worm control activity will vary with the circumstances of each community. Even villages participating in the same water and sanitation program may have to adopt different solutions to their

guinea worm problem depending on the abundance, adequacy, and reliability of their new water sources as well as other circumstances. Four general types of approach are possible:

- improved community water supply and health education;
- community water supply, health education, and chemical treatment;
- chemical treatment and health education; or
- health education with or without filtering.

The approach can emphasize prevention activities at the community level (water resources development and management, chemical treatment) or at the individual and family level (purification of water in the household, care of guinea worm patients) or a combination of both. Community-level activities can be largely managed and financed by outsiders or primarily in the community. Activities directed at educating and assisting families can be carried out by outsiders or by people from the community. Usually the most effective approach will involve a partnership between community people and outsiders, although the balance of the partnership will depend on local circumstances.

To design a feasible and effective approach, a community committed to reducing the problem of guinea worm must clearly understand the various options. The community must also participate in the planning of "phased" options, i.e., beginning with hygiene education and planning of improved sources. Both strategies will require that villagers recognize that it is their project. Educational steps must accompany any approach used.

In each target village, it is important to ask the question, "Who else is working in the village and should be involved with guinea worm activities?" For example, schoolteachers are a great resource. They can become lay village health workers and they are also a good link between the traditional village structure and the government health workers.

The importance of providing school-based education should not be overlooked. There are many activities which could involve students, especially understanding the importance of potable water, or using local water filtering techniques. Child-to-child activities could be used in conjunction with an educational program.

Village health volunteers are another important key in the community's preparation stage. If such a person is already working on health matters, he or she is a good conduit for health education regarding guinea worm control. The volunteers should not be overburdened, however; their activities should be limited to no more than one half-day per week, so as not to interfere with employment or economic obligations. It is also important that the village recognize the efforts of the volunteer's hard work.

Step Five: Taking Charge of the Activity

Getting under way with guinea worm activities, the community will need to use

1. Community-wide activities, combining the resources of outside agencies and the village itself, and
2. Activities directed at household and individual practices and behavior.

4.3.2 Step Six: Sustainability of Guinea Worm Control Activities

It is a seeming contradiction of terms to discuss sustainability of guinea worm components, as one hopes for interruption of the cycle and complete eradication of the problem. As mentioned earlier, a community's ability to identify the cause of guinea worm and the required steps to control it will, eventually, alleviate the need to consider issues of sustainability of the program.

The identification of the causes of the problem in a community and developing health education strategies for its control will hopefully lead to a community-based approach to build an improved water source. These strategies will result in the control and eradication of the disease.

The case of Kati village in Togo, a project implemented by World Neighbors, is a good example of this approach. Here, it took World Neighbors staff almost two years of community-based activities before community members made the clear connection between guinea worm and their water sources. Once this recognition took place, the community itself collected money and drilled for an improved water source. Until this happened, health education programs were carried out, primarily filtering, which also helped reduce the incidence of the disease. Within five years, there were only two cases of guinea worm disease, compared to 900 infected five years earlier.

What does the Kati case show about sustainability? A guinea worm program developed with the community and for which the community assumes responsibility is sustainable. Villagers identified the cause and worked on prevention. If the improved water system breaks down temporarily, community members will know how to prevent reintroduction of the disease by filtering or other precautionary steps. Most important, now that this community has successfully controlled a disease, the experience has no doubt empowered them to undertake other development programs. Thus, while sustainability may not be an issue in terms of guinea worm, the experience of controlling this disease has developed the capability in the village for undertaking additional activities.

In the case of Idere, Nigeria, the government installed a water system which broke down barely five years after its installation and guinea worm was reintroduced. Here, because community members had not participated in identifying the causes of illness, specifically guinea worm, nor in the health education that should accompany water projects, reinfection could only be expected.

In conclusion, issues of sustainability have to be addressed in cases where, as frequently happens, water systems are broken, or when communities have to rely on hygiene education alone as a stop-gap until either they or the government are able to provide improved water systems.

Step Six: Sustaining the Activity

Communities must be prepared for a long-term effort in guinea worm control. Sustaining the effort will require:

1. A sound conviction in the community that guinea worm is a preventable problem (through continued health education) and calls for a strong community commitment (ongoing monitoring and an investment of money and time).
2. An approach which focuses on community involvement to develop the human resource capability of the community to undertake the control of other diseases.
3. Awareness that mechanical or water system breakdowns need not bring a return of guinea worm disease. Other control measures are within the capacity of the community.
4. Recognition that reintroduction of the problem can occur from contacts beyond the community itself. Continued surveillance is required, along with care of those with the disease to prevent spread in a community.

APPENDIX A

Guinea Worm Control in the Schools

GUINEA WORM PROJECT

First inspection level: _____

Name of school: _____

Name of village: _____

Name of director: _____

Names of teachers: _____

Number of students who attend the school: _____

How many students had guinea worm during the course of the 1984-85 school year? _____

LIST THE VILLAGES SERVED BY THE SCHOOL

Village	Approximate Population	Number of Guinea Worm Cases	Number and Type of Water Source	Type of Pump	Existence of Health Committee in the Village	Governmental Services at Work in the Village (Indicate the # of dispensaries, social agents, family homes)

WORK GUIDE

CAMPAIGN FOR GUINEA WORM CONTROL AT SCHOOL

This document describes the activities that the school should undertake in the framework of the campaign for the fight against guinea worm. It is of particular interest to directors, teachers, and students.

First Stage: Meeting with parent teacher associations to explain the new strategies for schools for health education (Meeting for Awareness)

- Present the problems of guinea worm to the villagers with the help of campaign directors or another representative from the Department of Health.
- Present the project (Campaign for the Fight against Guinea Worm) and give a detailed explanation of the school's role.

Second Stage: Meeting with students and their teachers

- Explain the project to the students.
- Discuss the need for the existence of a school health committee for guinea worm.
 - Explain or reinforce the task for the current committee.

Third Stage: Educational lessons for health, practical activities

- A) Guinea worm (in universal terms)
- B) How to get guinea worm
- C) How to take care of guinea worm
- D) How to prevent it (1 and 2)

Fourth Stage: Activities between schools and village for students of CM 1 and CM 2 levels

EVALUATION OF THE INITIAL SITUATION

- Ask them to take a small poll among their neighbors using the following questions:
 - 1) During the last year did anybody in your family have guinea worm?
 - 2) What do you do when you have guinea worm?

3) Have you heard of filters? If yes, what is their use?
How does one filter water?

4) How do you think someone gets guinea worm?

- Make a synthesis of this at the school. Discuss this with the students and save the information in order to compare it the following year.

Fifth Stage: Technical poster - make available for every level at school.
Our neighborhood: A map of health

Sixth Stage: Conduct a play with village students.

Seventh Stage: Follow up of the activities

What actions should the students undertake?

What results should they get?

What are some solutions to the problems that they might encounter?

APPENDIX B

Village-Level Campaign for Guinea Worm Control

SURVEY QUESTIONNAIRE

1. Village name
2. Number of inhabitants
3. Is there a school?
4. Number of students
5. Number of students with guinea worm
6. Number of students who have left school to take the place of a family member who has guinea worm
7. Type of water source
8. Is there a village development committee?
9. Is there a health center or a social center in the village nearby?
10. What other government influences are present in the village?

Make a regional study to determine the types of projects.

TYPES OF PROJECTS

Non-governmental?

Sponsored by governmental?

Governmental?

Can we make a connection between the programs of these projects and this program (to conduct health education, to eradicate guinea worm: to find help by looking elsewhere)?

Create district level supervisory teams in the effected areas.

Create awareness for all the district level teams (See appendix 1)

Choose lists of villages by district.

CRITERIA

1. High number of guinea worm cases among the population
2. Existence of a potable water source (wells or pump)
3. Existence of schools in the village or nearby
4. Village development committee
5. All of the selected villages within an area of 35 kilometers or more of the district headquarters
6. Health center or social center of the village or nearby

PROGRAM FOR GUINEA WORM CONTROL

INFORMATION FORM

- District _____
- Name of village _____
- Number of inhabitants _____
- Total number of cases of guinea worm reported this year or last _____
- Is there a school in the village?
_____ No _____ Yes, how many?
- How far away is it? _____
- Number of students in the school _____
- Number of students with guinea worm this year or last year _____
- Is there a health center?
_____ Yes _____ No
- How far away is the nearest health center? _____
- Is there a social center in the village?
_____ Yes _____ No
- What are the water sources used in the village?
_____ Pond
_____ Dam
_____ Creek or River
_____ Well _____ Number
_____ Cisterns _____ Public _____ How many?
_____ Pumps _____ How many?

GUINEA WORM RESEARCH - _____ DISTRICT

VILLAGE EVALUATION

Name of Village: _____ County: _____

Trainer(s): _____ Date: _____

Ask the leader:

1. Approximate number of concessions in village: _____

2. Approximate number of people: _____

3. Approximate number of people with guinea worm
last year: _____

4. In your opinion, what causes guinea worm? _____

5. In your opinion, can one prevent guinea worm?
_____ Yes _____ No _____ I don't know

If yes, how? _____

6. How is guinea worm treated in this village? _____

7. What water points are used by the village inhabitants during the year?

Type of water point	Does it dry up? (yes or no)	If yes, during which months?	Potential source of infection? (yes or no)

REFERENCE TERMS

FOR THE GUINEA WORM CONTROL PROJECT

The goal of this activity consists of:

- Training field agents (directors and school teachers, social advancement agents (SAA), and itinerant agents) in health education for the fight against guinea worm
- Organizing the necessary structure for the fight against guinea worm (meetings of village leaders, meetings with the people, environmental studies, project presentations, village plan of action) in the targeted communities where there is none
- Motivating the village committees, the health volunteers and other village leaders
- Making weekly visits to the targeted localities for the program follow-up (at least twice a month for each village)
- Meeting with the district team once a month in order to present a monthly activity report
- Devoting eighty percent of one's time for the fight against guinea worm
- Making an evaluation and opening the frontier for the choice of new target localities for the following years

Field agent: Hygiene assistant or another health agent

TRAINER WORK GUIDE FOR GUINEA WORM CONTROL

First Stage: Project presentation to the villages. Introduction to the village leaders (development committee, chief political leaders, neighborhood leaders, health workers, healers)

- A. First encounter: Inform the village chief.
- Briefly make an explanation of the project.
 - Arrange a time to meet with the chief, the leaders, the influential people and leading women of the community.
- B. Second meeting with the chief, the leaders, those with influence and the villagers on the health committee.
- Explain the project.
 - Obtain the agreement of the chief and of his co-workers for the start of the project.
 - Conduct the survey (at this point, if there are no women in the group, ask for their participation).

IN VILLAGES WITHOUT HEALTH COMMITTEES OR DEVELOPMENT COMMITTEES, DO THE FOLLOWING:

- C. Third encounter with the entire village population
- Introduce the project: explain the goals and objectives (major message of the campaign).
 - Create a village development committee.
 - Determine the structure: the minimum number of members, while advising that all ethnic and social elements of the village be represented.
 - The committee should be composed of a president, a secretary, a treasurer, and four to seven members (there should be at least four women on the health committee).
 - Discuss the role of the community development committee members and their responsibilities.
 - Assign the task of choosing the village development committee to represent the village.
 - Choose a date for the next meeting.

Second Stage: Introduction to the population (entire population)

A. First Meeting: Discuss the choice of EGW (Eradication of Guinea Worm) volunteers.

- Explain the roles and the tasks for all EGW volunteers.
- Explain the necessary qualities for being a volunteer (criteria for the choice of EGW volunteers).

B. Discuss the project structure in the village.

- Representation of volunteers by neighborhood
- Ask for volunteers from each neighborhood in order to determine the number of EGW volunteers (at least 2, maximum 3, 2 women, 1 man and 1 woman, 1 man)
- Ask the people from each neighborhood in order to find out the number of EGW volunteers.
 - Ask them to do it before the next meeting.
- Arrange the date of the next meeting (in 2 to 4 weeks).

Third Stage: Discussion with EGW volunteers (people chosen: women, man)

A. First meeting:

- Explain the EGW campaign.
- Discuss their roles and tasks.
- Determine if they are still interested and available for their roles (period of their activity in the village).
- Arrange the date for the next meeting.

B. Second meeting:

- Ask them to take a small poll among their neighbors in order to
 - introduce and explain the campaign,
 - ask the following questions:
 1. During the last year, did you have guinea worm?
Number of cases? Number of family members?
 2. What do you do when you have guinea worm?

3. Have you heard about filtration?
If yes, what is its use?
How doe one filter water?

4. How does one get guinea worm?

- Arrange the date for the next meeting with the volunteers.

C. Third meeting with health volunteers for the EGW:

- Discuss the results of the small poll taken among their neighbors (N.B. make a report in the village notebook).

Fourth Stage: Meeting with the entire population

A. First meeting:

- Explain the results of the survey (the villagers must know what is happening in the village or at their homes).
- Explzain the reason for this survey.
- Ask the village people what they have in mind for the EGW project.
 - Suggest health education.
- Arrange the date for the next meeting with the EGW volunteers.

Fifth Stage: Training of volunteers

- Discuss how to serve as a volunteer in the campaign and how to complete one's task.
- Review the problem of guinea worm.
 - Knowlege of the ways of transmission, causes and preventive measures for guinea worm
- Discuss the information gathered from neighbors.
 - . Frequency of guinea worm occurence
 - Beliefs, customs and current treatment
 - Knowlege of filtration
- How to lead a lesson on health (pedagogie)
- History of Koffi and Affi

- Filtration demonstration
- Practical use of the health and filtration lesson
- How to organize their neighbors for lessons
- Ask the volunteers to give the lessons to their neighbors
- Arrange a date for the follow-up.

Sixth Stage: Follow up of EGW activities (EGW Volunteers)

- Discuss successes and difficulties encountered in the field.
 - Fill out evaluation form.
- Discuss solutions to problems.
- Review training program - review of pedagogy.
- Observe 2 to 3 lesson presentations in the field (participate yourself in the beginning lessons).
- Make sure that message has been well understood.
- Fill in the gaps that have been found.
- Ask volunteers to continue lessons.
- Arrange date for next meeting.

Seventh Stage: Follow up for EGW Campaign (entire population)

- Underline local follow-up: made by a team other than the one that worked in the area.
 - Choose homes at random.
 - Ask questions about the training elements and the results of filtration.
 1. What took place during the training?
 2. What was learned?
 3. Was filtration used?
 - With what do you filter your water (see the material)?
 - Ask them to demonstrate filtration for you.

- At the volunteer level, review elements of the fifth stage.

● Evaluation

After 3 months Test the knowledge and the degree of application
6 months (of filtration).

First year Number of guinea worm cases (in the village)

MONTHLY TRAINER ACTIVITY REPORT
FOR THE GUINEA WORM CONTROL PROJECT

Name of Trainer: _____ Date: _____

District: _____ How many villages do you take care
of? _____

Subject: Write a brief report on your activities, to include the following
(You may write on the back):

Report:

Failures:

Results:

Obstacles:

Suggestions:

N.B. Send one report to your chief doctor of the Health Subdivision, one to
the SNES Bureau, and keep a third report for yourself.

APPENDIX C

**Community Involvement in Social Marketing:
Guinea Worm Control**

by

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Case Studies

COMMUNITY INVOLVEMENT IN SOCIAL
MARKETING: GUINEAWORM CONTROL*

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ABSTRACT

Social marketing as a health education strategy has the potential for encouraging the adoption of new health technologies. The focus on the individual, though, holds the risk of victim blaming. This can be overcome if the consumers/community are involved in the four major components of the marketing strategy—product design, price, distribution and promotion. The community of Idere, Nigeria, has recently been involved in marketing a monofilament nylon cloth filter to prevent the water-borne helminthic disease, guineaworm. Local tailors produced the filters. Volunteer primary health workers debated pricing, sold the product and educated each consumer. Coverage in those neighborhoods and farm settlements where primary health workers were resident was nearly double that of other sections showing the value of local action to market health changes.

Social marketing has been heralded as the new strategy that will enable health education to make an impact on a mass level [1]. Like new ideas in general, this application of commercial marketing concepts to the promotion of socially desirable goals is met with skepticism of both the ethical and programmatic varieties. The staff of the African Regional Health Education Centre (ARHEC) in Ibadan, Nigeria, were aware of these drawbacks when the idea of using social

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marketing in the control of guineaworm disease arose. Yet they felt that social marketing could be adapted to the principles and practice of community health education if proper attention was given to the need for consumer involvement.

ETHICAL CONCERNS

Two major ethical problems make the health educator reluctant to give full consideration to social marketing strategies. The most obvious concern is the link between social marketing and its commercial counterpart which is perceived as persuasive, if not coercive, and therefore many steps away from the desired notion of voluntary behavior change [2]. Marketing appears to be a process planned by professionals with little room for active and meaningful consumer involvement.

A second and sometimes less articulated issue is the focus of social marketing which is more toward individuals than institutions or society. This opens up the problem of victim-blaming [3]: sell a product, service or idea that will help the individual cope, while leaving the unhealthy social and economic system unchanged. One senses this problem even at the methodological level. Marketing has relied traditionally on media or information strategies aimed at individual consumers. Such strategies cannot redress structural faults and often fail even to influence the complex etiology of the individual behaviors which they have targeted [4]. The lesson must be learned time and time again that awareness is not enough to bring about change [5, 6].

TECHNOLOGICAL LIMITS

Although social marketing, it is said, does not rely exclusively on selling a tangible product [1], ultimately some artifact, tool, or substance is involved. An agency may promote behaviors like jogging or home-based oral rehydration therapy. The consumer, to achieve these behaviors, may find herself buying new shoes or salt, sugar, and a special sized teaspoon. Therefore even though an agency may not be selling a social or health product, it cannot afford to ignore the technologies which the consumer must acquire and master before she can perfect the desired behavior. This is quite true in the prevention of guineaworm, a water-borne helminthic disease.

While not using modern marketing techniques, health workers have been spreading simple preventive messages for decades throughout the rural areas of Africa and India where guineaworm is endemic. When this painful subcutaneous parasite is ready to expell its larvae, it forms an ulcer on the host's skin to gain access to pond water where the host might wade. The larvae, once liberated in

the pond, are swallowed by a minute crustacean of the cyclops species. When water containing infected cyclops is drunk, the larvae are freed in the stomach of the host, pass through the stomach wall and begin the approximately year-long process of growth and migration. The worm having grown to nearly a meter in length usually aims for the lower limbs to increase the likelihood of its larvae finding a water source.

Consequent to this information health workers suggest that people boil their drinking water if possible or in the alternative, filter it through a clean piece of cloth. The need for sanitary wells is also emphasized or at least a protected source of water into which infected persons cannot wade.

The suggested behaviors sound simple, but existing technologies in poor rural areas for achieving prevention are limited. Fuel for boiling water is often scarce, expensive and time-consuming to gather. Boiling or "cooking" water is also culturally suspect. A square of clean cloth may not be too expensive, but it is awkward to use for filtering, especially when a woman is already tired from walking many miles to fetch the water. Also common cotton cloth becomes dirty quickly from pond water, thereby clogging. Neither does the common cloth have a guaranteed mesh size in its weaving, so some infected cyclops may slip through. Until these problems can be overcome, there is little which is technologically appropriate and feasible that social marketing can promote in terms of individual action.

The idea of a sanitary well, because of the extent of human and material resources required in its construction, is more a community endeavor. This requires community development and organization strategies. Improved water supply has been the main approach to guineaworm control in the past, but because of logistical and economic problems in reaching and serving rural areas, water supply has become a long term goal for many communities. This leaves farmers suffering the debilitating pains of guineaworm with little hope for immediate protection.

Fortunately experiments studying cyclops have led to the discovery of a durable and reliable filtering material, monofilament nylon gauze [7, 8]. The nylon fibers are one continuous strand, not the twisted fibers of traditional cloth which so easily capture dirt. When woven, these single fiber strands form a uniform mesh size like a grid. A guaranteed grid size can be obtained which will block cyclops large enough to have swallowed a guineaworm larva, while at the same time allowing water to flow through smoothly.

The monofilament cloth offers a basic product, which if designed properly could provide the basis for social marketing. This would offer a temporary solution to the guineaworm problem while long-term efforts proceed to provide a reliable community water supply, in other words, a multi-strategy approach to guineaworm control [9]. This approach will address the problem on both the individual and societal levels.

MARKETING STRATEGY

In simple terms there are four major components to a marketing strategy—product, price, distribution, and promotion [10]. The educational input to marketing has traditionally been limited to the promotional end. In order to adapt marketing to health education (as opposed to the other way around), one must consider the issue of consumer participation. The marketing process will become educational only if the community is involved in all four aspects of marketing strategy.

The social marketing project for guineaworm control took place in Idere, Nigeria. Guineaworm has plagued the town and its surrounding farm hamlets since time immemorial, but prevalence rose to new heights when a short-lived piped water system collapsed. Residents of the farm hamlets who account for 20 percent of Idere's 10,000 population, never enjoyed the tap water and served as a reservoir of infection.

Efforts to control the disease began with a pilot program to train community-selected volunteer primary health workers (PHWs) in 1978, by staff and students of ARIIEC [11]. This was later expanded with assistance from the UNDP/World Bank/WHO Special Program of Research and Training in Tropical Diseases (TDR). Both guineaworm control and adequate water supply were found among the top four felt needs of the community [12]. The ensuing efforts by Idere PHWs and ARIIEC staff resulted in wells in some hamlets and sections of town, but pockets of disease remained due to economic and geological problems, [9]. The prospect of personal protection through filters appeared to be a desirable addition to the guineaworm control armory. (See summary of marketing strategy in Figure 1.)

Product Design

Often a consumer's relationship with a product does not begin formally until after she makes an acquisition. There may have been market research to determine consumer preferences in color, style, size, or other attributes, but there is usually very little consumer involvement in directly shaping the design of the product. This lack of interaction between producer and consumer can lead to a rejection of the product and wasting of resources that went into marketing the product. This problem had to be avoided if the filters designed to prevent guineaworm were to achieve their objective.

A forum was needed in Idere where meaningful community input in filter design could occur. In October 1983, the PHWs had formed an association which was geared to helping them acquire basic resources to do their job, provide them with continuing education and give them a basis for joint action to solve community health problems. With over thirty active members from all sections

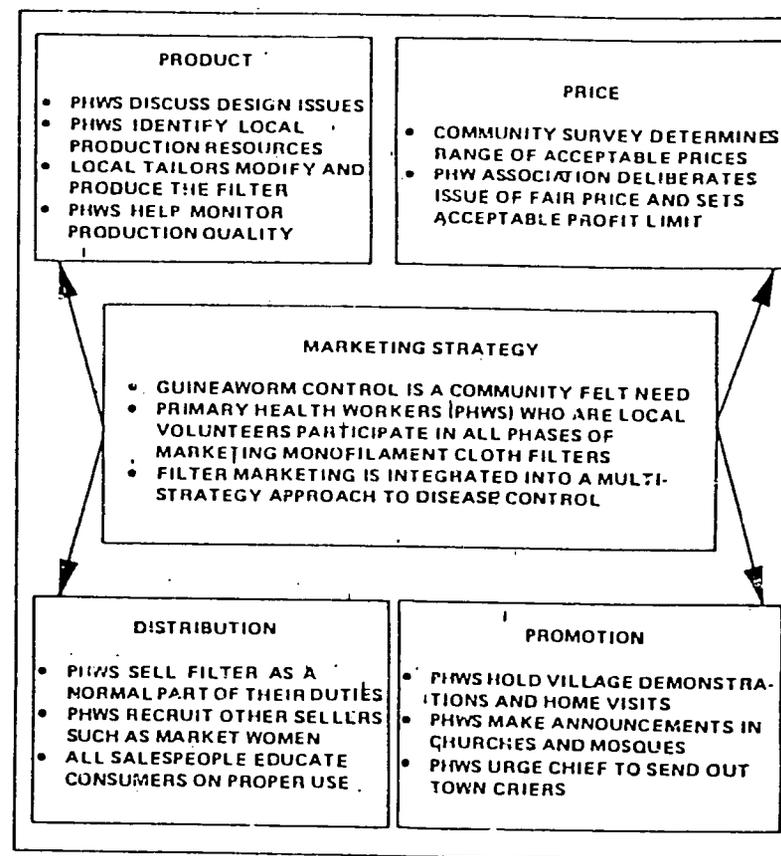


Figure 1. Community involvement in social marketing of monofilament nylon cloth water filters for guineaworm control in Idere, Nigeria.

of the town and hamlets, the association seemed the likely vehicle for fostering community involvement in this aspect of guineaworm control.

At its first formal meeting the PHW Association began to tackle the issue of guineaworm control. The options of both wells and filters were discussed. The former became the focus of long-term fundraising. The latter was slated for immediate action. With guidance from the health education team from ARIIEC, the PHWs began to consider ways to design and produce a filter. One idea proposed was the insertion of white cloth into the wooden frames used locally

to sieve flour. If the idea was found feasible, the association could sponsor production and sale.

Investigations eventually revealed that the filter idea could not be implemented easily. Wooden framed sieves were found to be uncommon locally as metal and plastic ones, made commercially in the city had now flooded the market. Because these were welded or molded in one piece, they could not be adapted for use as filters. The few remaining people who said they could make the old style sieve estimated the cost with cloth at around \$3.00 each. This was found to be a minimum price because drinking water pots come in a variety of sizes. Although the PIWs agreed that the design would certainly be convenient to use, the cost factor caused them to shelve the idea for the meantime. Still a few PIWs went ahead and had wooden framed filters constructed for their personal use.

The TDR program was aware of the concerns and aims of the Idere PIWs since it had sponsored the bulk of their training to learn more about the potentials for guineaworm control in the context of primary health care. The studies on cyclops mentioned earlier were also sponsored by TDR, which fostered a link between the two projects. In April 1984, TDR sent a consultant microbiologist with his monofilament nylon gauze to Idere. Together with the health education team he examined local drinking pots, visited local tailors, toured the local market and studied samples of local pond water to determine cyclops species. At the conclusion of his visit a prototype design for a monofilament filter was developed [7].

The key element in the design was a rubber band, actually strips of old inner tubes commonly sold in the local market for sling shots. These sold for about fifty cents each, but could be purchased more cheaply in bulk. Cloth was cut in circles and the rubber band was sewn into the edge/hem. This was not only cheaper than using a wooden frame, but also fit more securely on the pot so that unfiltered water could not spill in by mistake. The PIWs were impressed with the design modification. TDR then decided to supply a small quantity of the monofilament cloth for experimental production, marketing and use in Idere.

Prior to the arrival of the cloth, the health education team, aided by locally recruited field assistants, surveyed Idere's main town and farm hamlets to determine the acceptability of the new filter. Interviews focused on women whose traditional domestic duties include water collection and possible treatment. Of the 371 interviewed, 56 percent had heard of filtering as a means of preventing guineaworm, but only 10 percent said that they practiced it. When shown a prototype of the new filter, all but three women said they would be willing to buy one. A specific price was mentioned by 63 percent of women which ranged from fifty cents to ten dollars per filter. An average price was three dollars and ten cents, and the median was two dollars. Of those who mentioned a price, 75 percent said they would pay at least two dollars.

Price was not the only survey consideration. As noted pots come in different sizes. The largest had a mouth of twenty-four inches while the smallest was only

six inches. The most common sizes of the 564 pots measured were fourteen inches (12.6%), fifteen inches (31.7%), sixteen inches (28.0%), and seventeen inches (14.0%). Smaller pots accounted for 7.2 percent while 6.5 percent were larger. With this information it was decided to make filters in three sizes—small (less than thirteen inches diameter), medium (13-16 inches) and large (more than sixteen inches in diameter).

When the cloth arrived in Idere in August 1985, the PIWs were immediately involved in the production process. One PIW was also chairman of the Idere Young Tailors Association. The PIWs naturally requested that he be responsible for arranging a group of tailors to commence local production. Besides himself, who served as supervisor, he selected three other tailors, two men and a woman. They all agreed to pool their efforts and brought the work to the woman tailor's shop which became the filter factory for the next month. The tailors advised the ARHEC staff to buy the rubber bands in bulk in Ibadan, the state capital, after which production began.

The tailors used their initiative to develop production methods. First they tried sewing the hem of the circles of cloth, then inserting the rubber bands, much as they do when making local trousers or skirts which have rope belts. Pulling the rubber against the nylon was found to be quite troublesome, so they began sewing the band directly into the filter. They also discovered that by setting their machines on zig-zag stitch the product would be stronger than if straight stitches were used. The health educators and PIW leaders came to observe production regularly and check for quality.

Production also had to take into consideration factors which would aid correct use. A research assistant working with the project was able to document that cyclops could survive in a damp filter overnight. If the user inadvertently reversed the filter when pouring water the next morning, these surviving cyclops would be washed into the drinking pot. To alleviate this problem it was decided that the tailors would sew with a black thread on top and a white one on the bottom, thereby making a visible distinction.

A series of ten steps for safe and correct filter use were developed. First the side with the black thread would always be placed upwards on the pot. The middle of the filter should sag so that water would not splash out. Water should be poured slowly for the same reason. All water should be allowed to drain through the filter to avoid contamination during removal. The filter should be removed carefully so that all debris and cyclops on the top side will not be flipped into the water pot.

Users were advised to wash the filter after use, shake it out thoroughly and dry it outside in the sun. To protect the filter it should be stored away from sharp objects. Ideally the dried filter could be kept in a small nylon bag. Finally, users were encouraged to inspect the filter for tears or holes before each use.

Price Setting

In the commercial sense marketing is said to contribute 50 percent to the value of a product [10]. Social marketing also adds value to the good, service or idea by increasing its accessibility to consumers, but to achieve social goals, the amount of marketing cost passed on to consumers must be carefully considered.

For the guineaworm filters the basic input costs were as follows. Rubber bands bought in bulk cost eighteen cents, which included a small wastage factor as not all bands were cut uniformly. Thin ones had to be discarded. The tailors agreed on a per filter sewing cost of forty cents which included supply of thread. Adding price of cloth and estimated transportation costs, base prices were set at a dollar twenty-five for small, a dollar fifty for medium and two dollars and fifty cents for large.

TDR, the funding source, had stressed the need to set a reasonable price that would test people's willingness to acquire filters but not inhibit acquisition. Based on this, additional cost issues such as staff time and transport for promotion and supervision of distribution and sales were not included. In the spirit of social marketing, the sponsoring agency was assumed to be bearing the brunt of marketing costs.

Plans were made for community members to serve as individual salespeople. As incentive, a small amount would be added to the basic cost of filters and retained by the salesperson. It was envisioned that PIWs would be highly involved in the sales because of their past experience and knowledge in guineaworm control. Other salespeople could include local market women. Since PIWs in their association function much as a health committee to the community, the issue of a fair return for salespeople was brought to them for deliberation.

The PIWs were very keen that the project not turn into a moneymaking exercise so that the majority of townspeople could benefit. The health educators suggested that a reasonable profit range be proposed to sellers, but the PIWs felt that price differences (for the same size filter) would generate ill feelings in the community and sabotage the program. Therefore they unanimously agreed that profit should be fixed at twenty cents per filter.

Distribution Arrangements

The Idere community consists of distinct sectors. As noted there is the main town and the fifty farm hamlets. The hamlets themselves are grouped in two main clusters. One group, located northeast of town has easy access to Idere either by foot or vehicle as the farthest hamlet is only twelve kilometers away. The other cluster is west of town across the Ofiki River. This sector is nearly cut off from town when the river runs full from approximately May through December. The only access is a bridge located twenty-five kilometers north of Idere. The need to extend coverage to all three areas was considered.

PIWs have been found effective in social marketing for nutrition [13] and family planning [14]. They are members of the community and have a dedication to improve the welfare of their co-villagers. In Idere, PIWs have been actively involved in guineaworm control for many years [11], so that distribution and sale of filters would fit naturally into their usual work. Most of the active PIWs were found in the main town and the northeast cluster of villages. Therefore it was expected that PIWs would form the core of salespeople in these areas.

Considering the relative size of the main town and the underserved nature of the western sector of villages, efforts were made to recruit other sellers. This would add another dimension to the marketing process as it would be possible to compare the work of local business people with the volunteer PIWs.

The final sales force consisted of thirty-five individuals, twenty-seven of whom were PIWs. Seven other townspeople agreed to sell including four women who sell provisions in the local markets, a tailor, a shoemaker and a farmer/preacher. The thirty-fifth salesperson was actually the project's field assistant. His original task was to monitor purchase and use, but when it was found that several of the villages had no easy access to a salesperson, it was decided to equip the field assistant with a supply of filters for direct sales.

All salespeople received training before being given their initial stock of twelve filters. The purpose and correct use of the filter were explained and demonstrated. Salespeople were reminded that health education was their major task, for if people did not use the filters regularly and correctly, the disease would not be prevented and people would be dissatisfied with the product. In particular salespeople were told that due to the long period the worm takes to develop (an average of twelve months), some customers may already be infected with the disease. These should be told that full benefits may not be seen for a year or more and only if constant use is made of safe, filtered drinking water.

Arrangements were made so that salespeople could receive additional stock easily. One of the PIWs volunteered to keep extra supplies in her home. Also the health education team brought filters with them to the fortnightly PIW meetings for those who needed more. It was also during this meeting that PIWs submitted their receipts. The field assistant was responsible for collections from non-PIW salespeople and from those PIWs who lived far from town and did not attend regularly.

Sales Promotion

The duty for promoting community awareness and encouraging sales was placed with the PIW Association. They called village and compound meetings where the filters were demonstrated. They also made house-to-house visits to explain and show the product. At the association meeting members were

designated to make announcements at the local churches and mosques. The PIW leaders visited the King of Idere to explain the project. He agreed to have his town criers make announcements about the filters.

The field assistant made monthly visits to villages and compounds to document sales and monitor use. He used these visits not only to promote sales but also to reinforce education about regular and correct use of the filters. He also checked with the PIWs to learn of their problems in promoting sales and offer solutions.

MARKETING OUTCOME

Sales began in October 1985, at the beginning of the dry season just before guineaworm transmission would start. During the next six months 407 filters were sold, 74 percent by the PIWs, 5.4 percent by the other salespeople, and 20.6 percent by the field assistant.

A sample of 779 households were monitored in both town and hamlets. Among these 32.6 percent had purchased a filter. This compares favorably to another product-oriented program, contraceptive social marketing, where activities in ten countries ranged from 0.4 percent to 15.3 percent of married women of reproductive age served or from 1.1 percent to 40.5 percent of current contraceptive users served [15].

The value of PIW and community involvement was demonstrated. Table 1 shows that in both villages and towns where the resident PIW had obtained filters to sell, coverage was highest. Even in locations where the resident PIW did not have filters, sales were higher than in other villages/compounds. As can be seen in locations with no PHW or with other resident salespeople, coverage was lowest.

The salespeople did perform their educational duties as 95 percent of sampled buyers reported that the seller both explained and demonstrated the proper use of the filters before sale. Of the ten points required for correct and safe use,

Table 1. Presence of PHW and Filter Sales in Idere Town and Hamlets

Households Possessing Filters	Hamlets and Extended Family Compounds				Total
	PHW Has Filter	PHW Has No Filter	Other Seller	No PHW	
Yes	149 (42.2%)	54 (33.3%)	15 (18.5%)	36 (19.6%)	254
No	204	108	66	147	525
Total	353	162	81	183	779

$$\chi^2 = 36.101, df = 3, p < 0.0005$$

buyers remembered an average of 7.6 items. Even among the 525 households that did not buy filters, 93 percent were aware of the product and all but four of these knew it was designed to prevent guineaworm.

Total sales surpassed \$700. In the context of a multi-strategy approach to guineaworm control, this money was donated by the project to the PIW Association's well fund. This provided nearly a fourth of the money used to dig two community wells which were completed in April 1986. This act also linked social marketing to the broader social issue of adequate and reliable water supply.

CONCLUSIONS

Not only is it possible to involve a community in all aspects of social marketing, but involvement pays dividends in terms of product usefulness and acceptability. This emphasizes the importance of meaningful interaction between producer and consumer of social products, an interaction which health educators have a duty to foster.

Concerning product design, the fact that the PIWs had given thoughtful consideration to the issue of filters made them receptive when a better technology came along. Their involvement in the production process gave them a deeper understanding of the product, making them better promoters and salespeople. The filter also heightened the PIWs' commitment to and feeling of competence in their overall health care duties by providing them a tangible contribution which they could make to community health. The PIWs' strong sense of involvement and ownership of the project even went as far as to override the researchers' interest in the possible effects of variable pricing.

Local involvement in actual production is a key element in developing an appropriate technology [16]. This has the benefits of reducing costs by using local resources and abilities, increasing local problem-solving capabilities and product acceptance, and even holds the possibility of providing local people with additional revenue. The Idere tailors in short, were in the best position to produce a filter that was most suited to their own environment.

The PIWs as community volunteers proved their value as salespeople, by selling on average over three times as many filters apiece than did the seven "commercial" salespeople. The sales by the field assistant were concentrated primarily in areas where no PIWs were present and were facilitated by his having regular motorcycle transportation. In future consideration could be given to how to facilitate PIW mobility beyond their own hamlets to provide health services to a wider area.

The PIWs had a clear motivation to sell, and some did not even collect the extra twenty cents to which they were entitled. In contrast the commercial sellers stocked filters among many other items which competed for their attention, items which would be open to the market forces of bargaining and

thereby more likely to bring a greater profit. One might suppose that involvement by the PIWs not only gave greater access for consumers to the product but also guaranteed it would be available at a reasonable price because of the PIWs' basic value orientation toward community service.

Overall sales for a first time effort were impressive. The positive community response could be linked to the fact that guineaworm control efforts had been underway for some years in Idere and that these efforts themselves were organized in response to a community felt need. The current approach to social marketing is generating a demand for a product or service [17], but from the health education point of view, the practical and ethical concern of responding to the client's self-perceived needs still holds much value, as can be seen in Idere.

Aside from generating sales, the project also increased community awareness, but awareness does not necessarily lead to acquisition. The diffusion process may continue if filters are placed on sale for another guineaworm season, but resistance will naturally continue. There are indications of cultural, economic and social variables that inhibit sales (and will be explored in a future paper). The presence of such variables again reinforces the need for multiple strategies in community health education programs.

In conclusion, social marketing is a neutral tool for social change as are many others. Advocacy can be educational if the client is encouraged to speak out for himself. Behavior modification can be educational if the patient helps develop her own treatment plan. Social marketing becomes educational when the community is involved in all stages of the marketing process, including determination of what are the basic health needs which marketing should address.

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