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IMPROVED RURAL TECHNOLOGY (IRT) PROJECT

698-0407

GUIDELINES

FOR

PREPARING AND APPROVING IRT ACTIVITIES

Africa Bureau, Office of Regional Affairs (AFR/RA)

Agency for International Development

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TABLE OF CONTENTS

I.	<u>IRT Project Description</u>	1
	A. Background	1
	B. Basic changes	1
	C. IRT activities: general requirements	2
	D. Categories of appropriate technology activities	3
II.	<u>IRT Approval Process</u>	4
	A. The Activity Identification Cable	4
	B. The Activity Paper	6
	A. Description of the activity	6
	B. Technical analysis	7
	C. Social considerations	7
	D. Grantee and other contributions	8
	E. Work plan	8
	F. Budget	8
III.	<u>IRT Project Activity Evaluation</u>	10
IV.	<u>Contractor Support</u>	11
ATTACHMENTS:		
	Draft AIC cable	A
	Sample Activity Paper	B

IRT PROJECT GUIDELINES

I. IRT PROJECT DESCRIPTION

A. Background

The Improved Rural Technology Project (IRT) is a vehicle through which USAID offices in sub-Saharan Africa can finance small-scale technology activities in rural areas. The project, which is managed in AID/W by the Africa Bureau Regional Affairs Office (AFR/RA), provides funding for up to \$100,000 per activity to local proposers who wish to test out and implement new approaches in such areas as agriculture, food processing, village water supplies, energy, off-farm income generation, health, and information exchange. A Washington-based contractor, Experience, Incorporated, assists USAIDs and proposers in development of proposals (Activity Papers) for IRT funding.

To date, after two years of IRT project activity, some sixteen activities have been approved and implemented in ten countries. While this is not an unimpressive record, AFR/RA, participating USAIDs, and the contractor have concluded that simplifying the review process for IRT funding would both accelerate the pace of approval of new activities and reduce the level of time and effort necessary for Activity Paper preparation. These revised guidelines thus represent an attempt to amalgamate the best thinking of the field, AID/W, and Experience, Incorporated as to how best to achieve this goal without compromising the quality of Activity Paper preparation.

B. Basic changes

Two basic changes distinguish the revised review process from the original. First is a shift in authority for approval of activities from AID/W to the field (see next section, IRT Approval Process). While the Activity Paper remains the basic document framing the proposed activity, the Mission Director¹ and not AFR/RA will have final approval. AID/W review contributions would essentially be limited to approval of the Activity Identification Cable (AIC) which the Mission submits to AID/W before preparing the Activity Paper and which provides a summary description of the proposed activity (see next section).

Second, the contractor, Experience, Incorporated, will be available to local proposers and USAIDs for direct help in drafting and reviewing Activity Papers, although participation of the contractor is not mandatory. The experience of a year and a half has shown conclusively that design of small

¹The term "Mission Director" as used in these guidelines, means the head of an Africa Bureau field post exercising authorities delegated by Africa Bureau Delegations of Authority Nos. 140 and 141.

appropriate technology activities can be technically complex and beyond the ability of some field-based proposers. Understaffed and overworked USAID offices usually cannot spare the time to help proposers produce quality Activity Papers. Therefore, AFR/RA will provide contractor assistance at the field stage of Activity Paper preparation in an attempt to substantially improve the quality of proposals. The task of writing Activity Papers is primarily the proposers', with Experience, Incorporated assisting in conceptualizing, making technical judgments, editing, and redrafting. However, in exceptional cases, the contractor can be expected to participate in the original drafting of the Paper, in close collaboration with the proposers; this presupposes that necessary preliminary data collection will be complete upon arrival of the contractor in country. Responsibility for review and approval of the Activity Paper rests with the Mission Director.

C. IRT activities: general requirements

The following set of general requirements will govern consideration of IRT activities:

- Eligible countries. All African field posts, with the exception of the Sahelian country posts¹, may sponsor IRT activities. Ivory Coast is also eligible.
- Level of funding. Activities may be proposed for a maximum of \$100,000 each. For host country government-sponsored activities, the 25 percent host country contribution requirement will apply; this can be waived by special request for RLDCs (Relatively Less Developed Countries). For activities sponsored by private voluntary organizations (PVOs), both U.S. and foreign, there must be a 25 percent non-AID contribution.
- Length of activity. Activities should be of 12-18 months duration, but in exceptional cases the Project Assistance Completion Date (PACD) may be extended for up to three years.
- Proposers. Proposers must be resident in the host country and should be the person(s) responsible for managing the activity. The proposer may be any person whose qualifications for execution of the activity are considered appropriate by the sponsoring organization and the USAID office. Proposers may represent host country government institutions, community-based organizations, host country and/or U.S. PVOs², international agencies, and Peace Corps.

¹Cape Verde, Chad, Gambia, Mali, Mauritania, Niger, Senegal, Upper Volta.

²Indigenous PVOs must be registered with the USAID Mission.

Grantees may be any of the above except the Peace Corps.

- Use of IRT Project funds. Project funds approved for IRT activities may be used for the purchase of materials and equipment as well as for related freight and transport costs to the capital city or port of entry. Funds may also support costs of technical consultants residing in Africa. Salary and maintenance expenses for host country personnel associated with the activity should be provided by the host country sponsor. However, local labor and overhead costs may be authorized by Mission Directors, if deemed appropriate.

In addition, project funds may be used to undertake short-term, in-country training programs or seminars in furtherance of a specific IRT activity.

- Number of activities per country. Each field post may propose a maximum of two IRT activities per fiscal year for funding. However, AFR/RA may raise this limit at its discretion, if circumstances warrant.

- Procurement source and nationality rules. For IRT grants to host country governments, the normal procurement source and nationality rules apply--i.e., the source, origin and nationality of goods and services will be AID Geographic Code 000 for all countries, except that AID Geographic Code 941 is the authorized code for the Relatively Least Developed Countries. Ocean shipping rules are as follows: 1) U.S. flag vessels where Code 000 is applicable, and 2) U.S. and cooperating country flag vessels where Code 941 is the authorized code. Local cost financing rules are those set forth in AID Handbook 1, Supplement B, Chapter 18, except that for shelf items having their origin in Geographic Code 899 countries but not in Geographic Code 941 countries, the limitations are \$50,000 per activity and \$10,000 per unit.

For IRT grants to PVOs, the order of preference established in AID Handbook 1, Supplement B, Chapter 16B1c(4) is applicable, i.e., United States, host country or Geographic Code 941, and Geographic Code 935.

- Experimental activities. USAID offices should encourage submission of proposals to test and demonstrate technologies and systems which have potential for adaptation and replicability elsewhere in the country and/or in Africa.

D. Categories of appropriate technology activities

Activities proposed for funding under the IRT Project must fall within one or more of the following categories:

1. Agricultural systems - improvement/development
2. Rural water supply and potable water development
3. Improved sources of nutrition

4. Renewable energies (wind, mini-hydroelectric, solar, bio-gas)
5. Tools and equipment production
6. Housing and construction materials development
7. Food storage and processing
8. Access roads construction
9. Sanitation systems development
10. Public health management
11. Income generation - crafts and light capital rural industry
12. Transportation

These categories are intended to promote a wide range of rural technology efforts. Both "hardware" (tools and equipment production) and "software" (e.g. income generation) efforts are encouraged.

II. IRT APPROVAL PROCESS

A. The Activity Identification Cable

The IRT approval process starts with the Activity Identification Cable (AIC), which the USAID field office prepares for submission to AFR/RA. The purpose of the AIC is to provide AFR/RA with sufficient information to permit a judgment as to whether or not the proposed activity meets basic IRT funding criteria (see categories, section I.D. above). The AIC is also a planning tool for AFR/RA, which must factor the activity into the schedule of upcoming IRT allotments and program necessary contractor assistance. The AIC is a one-to-two page cable¹ providing:

- brief description of proposed activity
- duration of activity
- proposer and grantee (if different from proposer)
- what is to be achieved (outputs)
- proposed beneficiaries (who are they, where do they live, how many?)
- procurement arrangements and waiver requests
- budget totals (U.S., host country, other donor contributions)
- Initial Environmental Examination (IEE). The IEE may be sent by separate cable or included as part of the AIC. If not part of the AIC, the IEE must be submitted to AID/W at the time of Activity Paper preparation. For IRT grants to PVOs, the IEE can be approved by the Mission Director and need not be included in the AIC. For all other IRT grants, however, the IEE is subject to AID/W concurrence².

¹See Attachment 1 for sample AIC.

²See AID Regulation 16, Section 216.4 as revised on October 23, 1980.

- requirements for contractor assistance in preparation of the Activity Paper. This can include expertise in engineering and/or general design capability. The AIC should describe technical aspects requiring special attention by the contractor and should specify pertinent technical data which will be available to the contractor upon arrival in country (e.g. water quality analysis, water flow data, wind velocities). The AIC should propose dates and duration of contractor TDY, and should specify to the extent possible the nature of assistance desired (e.g. draft IEE, advise on engineering or technical soundness of activity, help draft sections of Activity Paper).

AFR/RA strongly urges Missions to utilize contractor services to foster preparation of quality Activity Papers. It now seems clear that many delays in approval of Activity Papers submitted during the first year and a half of IRT implementation might have been avoided if trained specialists in design of appropriate technology projects had been available to USAIDs. The contractor should be seen as a staff resource, especially for smaller Missions. However, availability of contractor services does not obviate the need for a certain minimum amount of USAID/proposer planning for the proposed activity - planning which should take place before arrival of the contractor in country. The AIC is designed to ensure that this planning has indeed been carried out and to lessen the chance for misunderstandings between the Mission and the contractor as to what the contractor will be expected to produce during the TDY.

AFR/RA will notify the field by cable within fifteen days of receipt of the AIC, indicating whether the concept of the activity is approved or rejected. The activity concept will be examined for compliance with the following conditions;

1. The activity falls within IRT guidelines and AID priorities,
2. Essential items such as the procurement plan and waiver requests are included.

If the activity concept is not acceptable for the second reason, the field will have the option to submit supplemental information and to ask that the activity be reviewed again.

B. The Activity Paper

Following approval of the AIC, the Mission and the proposers may proceed with preparation of the Activity Paper, a six-to-ten page, single-spaced document which should follow the format outlined below.

Title page. The title page includes the project title (Improved Rural Technology), proposed activity title and brief description, proposer and grantee, duration of activity, amount of funding requested from AID, and host country contribution. The Activity Paper narrative contains:

A. DESCRIPTION OF THE ACTIVITY

1. General background of proposer/proposing organization

Give a brief description of the organization and the context in which the activity will take place. Describe briefly the circumstances leading to development of this proposal. Identify the grantee.

2. Problems identified

Discuss problems to be alleviated by the proposed activity. Be as specific as possible.

3. Brief description of activity (State in a few paragraphs).

4. Identification of beneficiaries

Indicate the characteristics, numbers, and location of people targeted to benefit from the proposed activity.

5. Analysis of benefits

Describe the benefits (achievements, outputs, etc.) of the activity. Show how costs associated with launching the activity will be offset by these benefits. Discuss possible impact of the activity on employment, productivity, and income distribution.

6. Other groups attempting to solve the same problem

Are there completed, ongoing, or planned projects that have dealt with or propose to deal with the problem identified? How does the proposed activity relate to these projects?

7. Replicability

Can this activity be implemented elsewhere to address similar problems? What institution(s) might be interested in funding this kind of activity?

8. Evaluation indicators

These are measures of the benefits cited in point 5 above. During future evaluations, they will help measure the success of the activity. Indicate as precisely as possible what the activity will produce (e.g. numbers of chicken coops built; dam constructed and in operation; number of KWH used; percentage of female population using new water source). Provide numerical indicators whenever possible.

B. TECHNICAL ANALYSIS

1. Specifications for devices/techniques

This material, including sketches, plan drawings, statistics, or photos, may be annexed to the Activity Paper. Include specifications for any machinery or equipment to be purchased.

2. Alternative techniques

Indicate reasonable alternate options for dealing with the identified problem and the reason for choosing the technique proposed.

3. Technical assistance requirements

Indicate any need for consulting services, including technical advice from the Washington-based contractor, Experience, Incorporated.

4. Project management

Describe the qualifications of individuals and institutions responsible for carrying out the proposed activity. Specify the management role each party will play.

5. Environmental considerations

How will the activity affect the natural environment? Briefly describe any negative or positive changes which may result from the activity.

C. SOCIAL CONSIDERATIONS

Is the proposed activity compatible with local patterns of decision-making? How does the activity relate to attitudes on such things as authority, family relationships, control over family/personal income, sex roles, mores and taboos, credit use, social organization, technological change?

D. GRANTEE AND OTHER CONTRIBUTIONS

1. Government/Private Support

Indicate government and/or private contributions to the activity, in cash or kind, including logistic support, buildings and site use, and personnel (salaries).

2. Beneficiary support

Indicate anticipated beneficiary contributions, including cash or in-kind contributions such as labor and logistic support. Attempt to assign a monetary value to in-kind contributions.

3. Calculation of host country and other contributions

Where the grantee is a host country government, the host country contribution to an activity includes both the government/private and beneficiary support mentioned above. It must equal 25 percent of the total activity cost. Total activity cost is the sum of the host country contribution and the IRT funds requested. The same basic calculations apply for grants to PVOs, although the 25 percent contribution may come from non-AID sources other than the host country.

To compute the 25 percent contribution, divide the IRT request by 0.75. This will give the total activity cost. Then subtract the IRT request from the total to get the host country or non-AID contribution.

Example:

The IRT request is \$25,000.

Divide:
$$\frac{\$25,000}{0.75} = \$33,333 \text{ or } \$33,350$$

Subtract:
$$\begin{array}{r} \$33,350 \\ - 25,000 \\ \hline \$ 8,350 \end{array} = \text{the host country or non-AID contribution.}$$

E. WORK PLAN

Provide a schedule of what tasks will be completed, when, and by whom, including dates for submission of progress reports prepared by the grantee.

F. BUDGET

Prepare a budget of estimated expenditures. For each commodity, list quantity, unit and unit price, source (e.g. U.S., local), estimated freight charges, and total cost. This first section should be designated "IRT funds requested". In a separate listing on the same page, show "host country contributions" or "non-AID contributions", including government/private, other donor, and beneficiary support.

The completed Activity Paper will be reviewed by the Mission, which is responsible for assuring that all statutory and regulatory requirements (e.g. procurement, host country contribution) have been met. Involved Experience, Incorporated personnel will be available to participate in the review and to make necessary changes in the Paper before departing post. If the IEE was not submitted to AID/W as part of the AIC, it must be sent in -- either by cable or in written form -- at the time of Activity Paper preparation. This is the only part of the Activity Paper that AID/W must review -- by regulatory requirement¹. Following AID/W approval of the IEE, the Mission Director may approve the activity. Funds will then be allotted to the Mission, which will draft and execute a Limited Scope Grant Agreement (LSGA) or other authorized form of grant agreement with the sponsoring agency/private organization.

Once the LSGA or other form of grant agreement is signed, the Mission should pouch to AFR/RA a copy of the agreement and a complete authorization package containing:

- the Activity Paper,
- the Project Data facesheet, signed by the Mission Director and dated,
- the authorization memo, including activity number², life of project costs, and any covenants cited in the LSGA.

It is conceivable that in a small number of cases the combined efforts of the proposers, the Mission, and Experience, Incorporated will not produce a finished Activity Paper by the time the contractor leaves post, and that additional technical research will be necessary before the Paper can be written. In such cases, Missions will be urged to send the Activity Paper, once completed, to Experience, Incorporated³ in Washington for technical review, before approving the activity. Experience, Incorporated comments will be cabled to the field by AFR/RA within ten days of receipt of the Activity Paper by the contractor. If the contractor recommends additional design work and the Mission agrees it is necessary, AFR/RA will make every effort to accommodate Missions requesting a second contractor TDY. However, given that multiple TDYs in pursuit of a single small project are not a cost-effective use of the contractor's time, a second trip to a country by Experience, Incorporated would be worked in along with other business in the same geographic area.

¹Except for PVO activities, for which the Mission Director can approve the IEE, as noted earlier.

²The activity number will be assigned by AFR/RA following approval of the AIC.

³Experience, Incorporated, 1725 K Street, NW, Suite 312, Washington, D.C. 20006, USA. Missions may also pouch Activity Papers to: Project Officer, IRT, AFR/RA, Room 3327 for forwarding to Experience, Incorporated.

III. IRT PROJECT ACTIVITY EVALUATION

AID field offices are requested to evaluate each approved activity in their host countries. A brief Project Evaluation Summary (PES) should be provided to AFR/RA for each activity undertaken. In view of the experimental nature of these activities, a single PES should be submitted by AID field offices for each activity completed within 18 months or less. For those activities which extend to 24 months or longer, a PES should be submitted after each 12-month period.

IV. CONTRACTOR SUPPORT

The contractor, Experience, Incorporated, provides technical support for the IRT Project as follows:

- Technical support: The contractor provides technical support in the field for preparation of Activity Papers as described earlier, responds to information requests, and supplies Africa-based consultant assistance and training services.
- Bulletin: The IRT project bulletin entitled "Rural Technology Bulletin" provides a quarterly summary of current appropriate technology applications in Africa. Each issue of the bulletin will feature a "State of the Art" section dealing in depth with some pertinent aspect of appropriate technology.

The bulletin is distributed to AID field offices, African rural technology groups, appropriate units within host governments, interested AID/W offices, and concerned international organizations.

- Promotion: The contractor documents and publicizes (through the media, workshops, seminars) certain activities which it feels best reflect the goals of IRT.
- Bibliographies: The contractor provides AID/W with a bibliography of appropriate technology materials contained in the IRT Project's appropriate technology collection. The bibliography is for the use of USAID field offices and their clients. Specific data is made available to groups actively working on development or execution of project activities. The bibliography is continually updated.
- Consultant's Roster: A roster of experts available to consult on technical, economic, or social aspects of appropriate rural technologies, development, and application is maintained by the contractor. The roster identifies people in Africa, who can perform these functions in support of the project.
- Workshops: The contractor may organize workshops on specific technology issues at the request of AID. Funds for this purpose would be drawn from those available for project activities.
- Evaluation: The contractor is available to perform evaluations of completed IRT activities.

- 12 -

Attachment A

DRAFT AIC CABLE

SUBJECT: PROPOSED IRT ACTIVITY (698-0407)
RURAL WATER SUPPLY AND DELIVERY TO FOUR NORTHERN SETTLEMENTS,
NIMBA COUNTY, BOTSUTHO

1. PEACE CORPS THROUGH MIN OF RURAL WORKS PROPOSES TO TEST LOW-COST WATER DELIVERY SYSTEM CONSISTING OF TWO HYDRAULIC RAM PUMPS DRAWING FROM THE WENDA RIVER, TWO CHLORINATORS, TWO RESERVOIRS, DISTRIBUTION SYSTEMS, AND COMMUNAL TAPS. FOUR SETTLEMENTS IN AN EXTENDED VILLAGE NUMBERING 561 PEOPLE WILL BE SERVED BY 20M³ OF WATER PER DAY. INSTALLATION COST WILL BE DOLS 35/PERSON, MAINTENANCE COST DOLS 2/PERSON/YEAR. ACTIVITY INCLUDES TRAINING IN MAINTENANCE OF WATER SUPPLY SYSTEM, SANITATION, AND PUBLIC HEALTH. ACTIVITY WILL LAST 12 MONTHS.

2. PROPOSER QUALIFICATIONS: PC HAS WATER RESOURCES ENGINEERS IN COUNTRY (2 PCV'S) AND WILL MANAGE ACTIVITY. LOCAL ENGINEERING STUDENT WILL PARTICIPATE, AND MINISTRY OF RURAL WORKS ENGINEER WILL CONSULT. MIN RURAL WORKS WILL BE GRANTEE.

3. OUTPUTS: SYSTEM WILL A) REDUCE INCIDENCE OF WATER-BORNE PARASITES, A MAJOR SOURCE OF INTESTINAL MALADIES, B) IMPROVE

13 -

~~A-2~~

HEALTH AND HYGIENE THROUGH INCREASED WATER SUPPLY AND SANITATION EDUCATION, C) FREE WOMEN AND CHILDREN FROM TIME-CONSUMING WATER TRANSPORT ALLOWING THEM TO PURSUE INCOME GENERATING OR EDUCATIONAL ACTIVITIES, D) SERVE AS A MODEL FOR OTHER PROJECTS OF ITS KIND.

4. BUDGET TOTALS AND PROCUREMENT: IRT FUNDS REQUESTED - DOLS 19,500, HOST COUNTRY CONTRIBUTION - DOLS 6,500. ITEMS TO BE PURCHASED IN THE U.S. WILL INCLUDE: CHLORINATORS, HYDRAULIC RAMS, SOLVENT CEMENT, PVC PIPE, AND CHLORINE TABLETS. ALL OTHER ITEMS CAN BE PURCHASED IN COUNTRY: METAL RESERVOIR, BLACK PIPE, DRUMS, CEMENT, AND HAND TOOLS. HOST COUNTRY CONTRIBUTION WILL CONSIST OF CONSULTING, LABOR, TRANSPORT, USE OF GOVERNMENT WORKSHOPS. NO WAIVERS ARE REQUESTED.

5. REQUEST EXPERIENCE, INCORPORATED ENGINEER TO ADVISE ON TECHNICAL SOUNDNESS OF ACTIVITY AND SIZING OF HYDRAULIC RAMS AND TO ASSIST IN PREPARATION OF FINAL DRAFT OF ACTIVITY PAPER. WATER QUALITY ANALYSIS IS ALREADY COMPLETE. ROUGH DRAFT OF ACTIVITY PAPER WILL BE AVAILABLE UPON ARRIVAL OF CONTRACTOR. PREFERRED ETA IS MID-MARCH FOR TWO WEEKS.

SAMPLE ACTIVITY PAPER

IMPROVED RURAL TECHNOLOGY PROJECT
698-0407

Proposed Activity Title:

RURAL WATER SUPPLY AND
DELIVERY TO FOUR NORTHERN PROVINCE
SETTLEMENTS (NIMBA COUNTY), BOTSUTHO

Proposer: Peace Corps
Grantee: Ministry of Rural Works

Over the course of 12 months, this activity proposes to develop and test a low-cost potable water system designed to meet the daily requirements of over 500 residents of four contiguous settlements in Northern Province. Water will be drawn by two hydraulic ram pumps on the Wenda River, treated in two gravity-fed chlorinators, stored in two reservoirs, and distributed to four settlements at the minimum rate of 20m³. Installation costs will be \$35/person. Continued operating costs are estimated to be \$2/person/year to be provided by the community. The system will be maintained by a local resident trained during the activity and paid through the maintenance budget.

Project funds requested:	\$19,500
Estimated host country contribution: (equivalent in kind)	\$ 6,500

A. DESCRIPTION OF THE ACTIVITY

1. General background of proposer/proposing organization

The Peace Corps has been active in a well-digging project in Botsutho for ten years and is well-known for its success in this activity. Currently, ten wells volunteers are stationed in the five most arid counties of the country. Peace Corps hopes, however, to deal with water problems in other areas of the country in the future and, to this end, plans to experiment with water delivery systems that may be installed and maintained at a lower cost than wells.

The idea for this activity was presented by Mr. Daniel Mnemba, a civil engineer originally from Nimba County. He approached PC volunteers William R. Smith and Harriet Jones and asked if PC might be interested in helping to install a water system in Nimba County. Jones and Smith agreed to take on the activity as a secondary project and won approval of the Peace Corps Director. If the activity proves successful, PC plans to use it as a model for future water programs in Botsutho.

2. Problems identified

This activity proposes to address the problem of inadequate potable water supply in four settlements (Bunea "Top", Bunea "Bottom", Mindu, and Little Mindu) in Nimba County, Northern Province. These settlements have a combined population of 561 people. Drinking and utility water is currently drawn from the nearby Wenda River. Water is carried to domestic sites in pottery, aluminum, or tin containers.

Lack of water treatment and contaminated containers contribute to the high incidence of endemic intestinal parasites found among the population.

Carrying water over long distances (transport distance is 1,400 meters for Little Mindu) places a time and energy burden upon women and children. Water transport and the collection of firewood occupy almost half of the women's workday.

Minimum daily potable water requirements are 10 liters/person/day (5.5 U.S. gallons), with 35 liters/person/day necessary to improve living and health conditions. The constraints of contaminated water and the burden of water transport can be satisfactorily relieved through use of the system outlined here.

3. Brief description of activity

This activity proposes to supply water through the construction of two hydraulic ram intakes at two sites on the Wenda River. The water will be treated by two gravity-fed, low-pressure chlorinators, stored in two reservoirs, and distributed to four settlements via communal taps. An estimated daily supply of 20m³ will be made available throughout the year.

4. Identification of beneficiaries

The target area is composed of four settlements covering an area of approximately six square miles. The settlements are actually an extended village and fall under the authority of sub-Chief Daniel Mkwa. The population distribution is as follows:

	Adults (over 13)	Children
Bunea "Top"	96	64
Bunea "Bottom"	81	59
Mindu	90	74
Little Mindu	<u>54</u>	<u>43</u>
	321	240

Total - 561 people

5. Analysis of benefits

The breakdown in per capita costs for the implementation of this activity is \$35/person with yearly maintenance costs estimated at \$2/person. The projected benefits are not easily expressed in numerical terms. However, improved health and the reduction of the workload for women and children are expected to increase productivity in the village as a whole.

Benefits

- * an adequate daily supply of water delivered to rural settlements and the probable reduction of water-borne disease.
- * a reduction in the amount of time and effort women and children must spend in procuring water. This reduction will permit more time for food cultivation and crafts work for women. While the value of these opportunities is yet to be determined, there are indications that the craft incomes now being realized by villagers in Southern Province where water systems have already been installed could easily be matched by women in these four settlements. The per capita income of artisans in Southern Province is reported by the FAO to be \$386/year.

- * an increase in school attendance as a result of young children being relieved of water transport duties.

6. Other groups attempting to solve the same problem

The Ministry of Plan has indicated its intent to include Nimba County in the proposed Water Development Program for Northern Province. The design phase of the program will begin some time during the course of the five-year development plan for 1980-1984. Construction of the dam and power station will take approximately five to seven years to complete.

In contrast, this activity is designed to test a low-cost alternative for delivering potable water to the rural population of Nimba County in the immediate future.

7. Replicability

In Nimba County, there are 207 additional settlements with an estimated population of 20,000 located near similar water sources. They have been cited in the WHO/Ministry of Health Report of February 1978 as having inadequate access to potable water.

Effective completion of this activity will provide:

- a. an opportunity to evaluate this water delivery technique in the Nimba County environment.
- b. technical information and associated cost/benefit data for use in other rural areas.

8. Evaluation indicators

1. installation of the water delivery system, including the reservoir, distribution system, ram pumps, communal taps, and chlorinators.
2. maintenance of the system by a trained villager.
3. delivery of 20m³ of water/day throughout the year.
4. 43% of population using taps for potable water.
5. 25% increase in the regular school attendance of young children.
6. noticeable decrease in the incidence of water-borne intestinal ailments.

B. TECHNICAL ANALYSIS

1. Specifications for devices or techniques

Materials and equipment for this activity are included in the annex:

- a. map of work site with hydraulic plan overlay
- b. rough profile of ram, chlorinator, reservoir and distribution networks with specifications
- c. the chlorinator

The chlorinator, PVC pipe, solvent cement and the hydraulic rams manufactured by RIFE will be purchased in the U.S. All other equipment and materials are available locally.

2. Alternative techniques

The government proposes construction of the Nibi Dam and the use of central pumping stations (hydro-electric) to deliver water to general sites in Nimba County. This plan will take many years to implement, whereas the use of hydraulic rams will provide water within a matter of months.

The use of power pumps (diesel) is inadvisable because of high initial costs, high fuel costs, lack of fuel distribution systems, complexity of equipment, and difficulty of maintenance.

Wells and hand pumps to adequately supply these communities with water would be too costly.

4. Technical assistance requirements

a. Consulting support

The MRW will contribute the services of a consulting engineer for approximately three weeks during the proposed activity, i.e. one week each during start-up, implementation, and evaluation.

b. Contractor assistance

A flexible plastic tubing (trade name ZM 28) manufactured in West Africa might serve as pipe material for the delivery and distribution sub-systems as an alternate to the PVC pipe from the U.S. Pertinent information about this product is lacking locally. The proposers request that Experience, Incorporated advise if ZM 28 is of the high pressure type, and include recommendations on the use of shut-off valves and taps in the proposed system.

5. Project management

William R. Smith - Peace Corps Volunteer. Mr. Smith holds a B. A. degree in Civil Engineering (Michigan State) and has been working in the activity area for 19 months with the government-sponsored Rural Works Program. He has the endorsement of the Peace Corps Director and local officials. Mr. Smith will manage the activity, assist in the design of the distribution system, help supervise construction, and take charge of procuring necessary equipment.

Harriet Jones - Peace Corps Volunteer. Ms. Jones has worked in the activity area for 11 months on potable water and solar energy (water heating) activities. Her participation in the activity has the endorsement of the Peace Corps Director and local officials. Ms. Jones will assist in system design, act as a liaison between the parties involved, and instruct local women in hygiene and sanitation.

Daniel Mnemba - Graduate student in Civil Engineering, National University. Mr. Mnemba is originally from Nimba County. He has offered his services free of charge and has prepared the annexed drawings and materials specifications. Mr. Mnemba will participate in the activity during his summer holidays. His responsibilities as assistant project manager will be to design the system and direct construction, including the self-help labor provided by villagers.

Peace Corps Staff - The Peace Corps will keep USAID/Botsutho advised of the activity's progress.

6. Environmental Considerations

The installation of materials and equipment and the operation of the proposed activity are not expected to cause changes in the availability of natural resources. Implementation of the activity should result in better control of water resources. (A more detailed environmental assessment, the Initial Environmental Examination, will be prepared by USAID/Botsutho).

C. SOCIAL CONSIDERATIONS

The settlements served by this activity comprise an extended village under the jurisdiction of sub-Chief Daniel Mkwa. In recognition of traditional authority structures, Mr. Mkwa participated in the development of the activity and presented the activity to the government.

Sex roles, family relationships, and social organization will not be disrupted. The responsibility for providing the family's water supplies is traditionally vested in

women. In actual practice, the task of drawing and transporting water is shared by women and children. With the installation of standpipes in the village, the burden of drawing and carrying water will be reduced. Children will have more time to attend school, and women will engage in income-generating activities. Men will perform the heavy labor required in clearing land and digging trenches for pipes. This division of labor between women, children, and men conforms to traditional social patterns.

Women will be called upon to make the greatest adjustment to the new system. Formerly, they gathered at the stream to exchange the news of the day. This was both a useful and enjoyable social experience that the women cannot be expected to give up. The social interaction that took place at the stream will have to occur elsewhere, in all probability at the communal taps.

The technological change introduced by this system is understandable to the villagers. They have been active in planning the activity and will continue to participate fully as work progresses. The involvement of the community in planning, construction, and maintenance ensures that local residents will feel a sense of pride and ownership in the system and that customs and mores will not be violated.

Personal and family revenue may increase as a result of the additional time women will have to devote to income-generating pursuits. This was the case in a similar water project implemented in Southern Province.

D. HOST COUNTRY CONTRIBUTION

1. Government/private support

The Ministry of Rural Works has endorsed the activity and will:

- a. transport imported goods from the port to work sites. This support will be supplied as frequently as deliveries are made, and will include vehicles, drivers, and assistants. \$ 600
- b. permit the use of machine and carpentry shops for tool repair, parts fabrication, and joinery. \$1525
- c. provide free delivery of locally-procured items. The cement, black pipe, hand tools, drums, and metallic reservoirs will be purchased at cost in state stores through an agreement with the MRW. \$1100
- d. provide materials: shut-off valves, taps, pipe unions for sub-system use, and rust-proof coating for the metallic reservoirs. \$ 375

- e. provide personnel support: see consultant services in Part B-4. In addition, the MRW has authorized the participation of rural works engineer Paul Naburu, an engineering professor at National University. Mr. Naburu will supervise Mr. Dbu Mkwa who will be trained during the course of the activity to maintain the system. \$1200

2. Beneficiaries

Sub-Chief Daniel Mkwa has pledged that during the installation phase, every man in the extended village will contribute a minimum of two working days each week to the project. No work is permitted on Sundays. \$ 700

3. Host country contribution

The host country contribution for this activity is \$6,500 which is 25% of the total activity cost of \$26,000 (IRT funds requested - \$19,500 - plus the \$6,500 host country contribution).

E. WORK PLAN

<u>Weeks</u>	<u>Task</u>	<u>Performed by:</u>
0 - 2	Consultant support	Ministry of Rural Works consultant and staff support
0 - 7	Ordering of material and supplies and awaiting delivery (pipe and tools)	Smith
0 - 12	Preparation of reservoirs	Smith, Mnemba, villagers
	Construction of intake and testing of hydro rams	Mnemba, Smith
7 - 12	Installation of pipe and rams	Smith, Mnemba, villagers
12	Start-up	Local team and consultant
20	Progress report 1	Local team
40	Progress report 2	Local team
52	Evaluation	AID mission/consultant

F. BUDGET

B-9

1. IKT Funds Requested

<u>Item</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Source</u>	<u>Est. Freight</u>	<u>Est. Total</u>
Chlorinator Model 050		2	128.50	U.S.	20.00	277.00
Hydraulic Ram RIFE #20B		2	250.00	U.S.	100.00	600.00
Chemicals (Calcium Hypochlorite - one year supply	5½ lb. jars	36	4.83	U.S.	30.00	203.88
Reservoir (metallic)	10m ³	2	2,000.00	local		4,000.00
Black pipe 2"	21 ft. length	10	53.20	local		532.00
PVC pipe 1½"	"	8,770	0.60	U.S.	1,400.00	6,662.00
Drums	200 l.	2	10.00	local		20.00
Solvent cement	gal.	150	1.90	U.S.	61.00	346.00
Cements	yds.	70	8.00	local		560.00
Hand tools	pcs.	300	15.00	local		4,500.00
					<u>1,611.00</u>	<u>17,700.88</u>
			10% contingency			<u>1,770.00</u>
			SUB-TOTAL			19,500.00

2. Host Country Contribution (25%) (See Section D for itemized listing)

a. Government/Private Contribution	4,800.00
b. Beneficiary Contribution	<u>1,700.00</u>
SUB-TOTAL	<u>6,500.00</u>

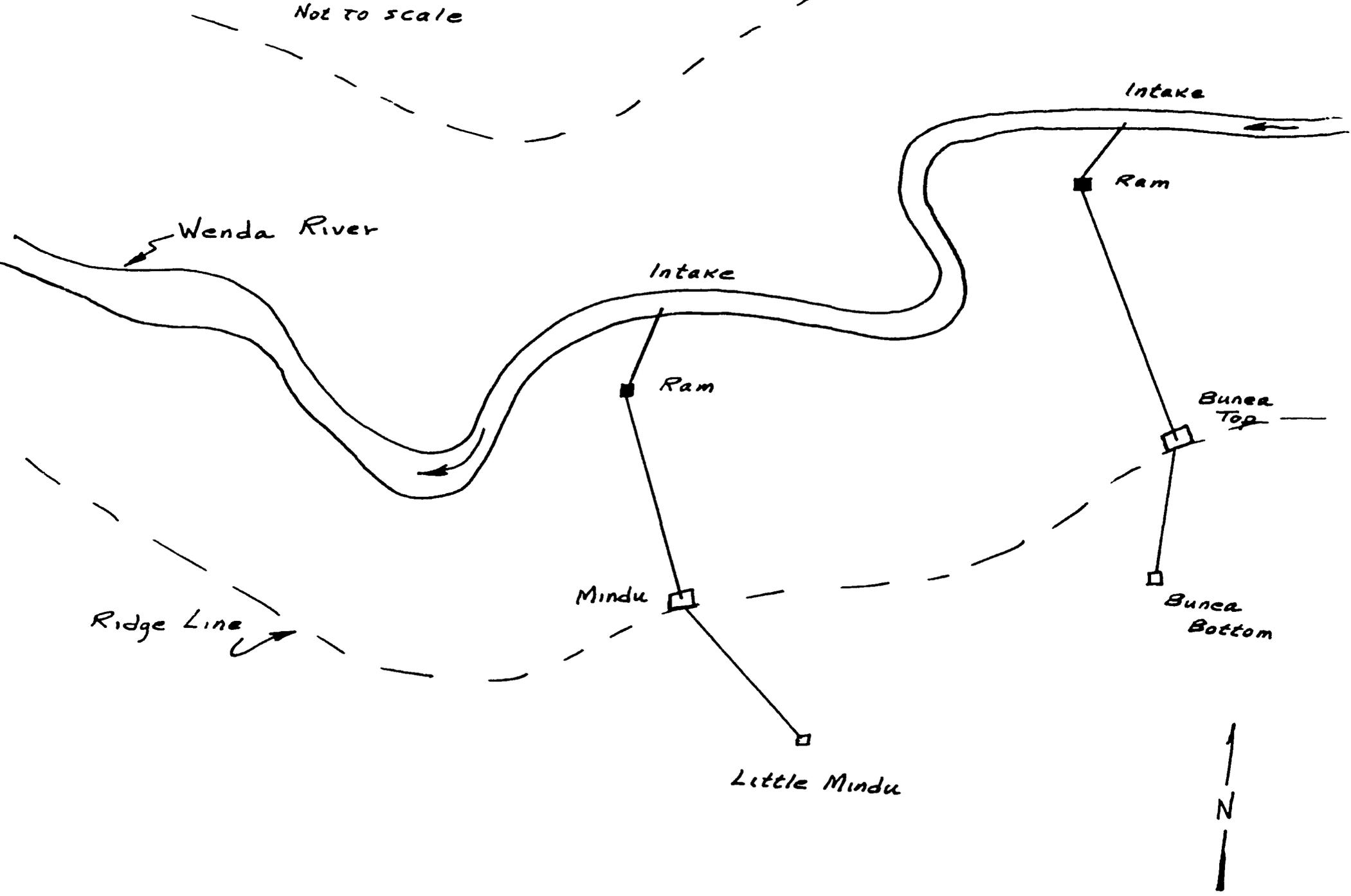
6,500.00

PROJECT TOTAL
(U.S. \$) 26,000.00

PLAN VIEW

Not to scale

A- WORK SITE



Wenda River

Intake

Ram

Mindu

Little Mindu

Intake

Ram

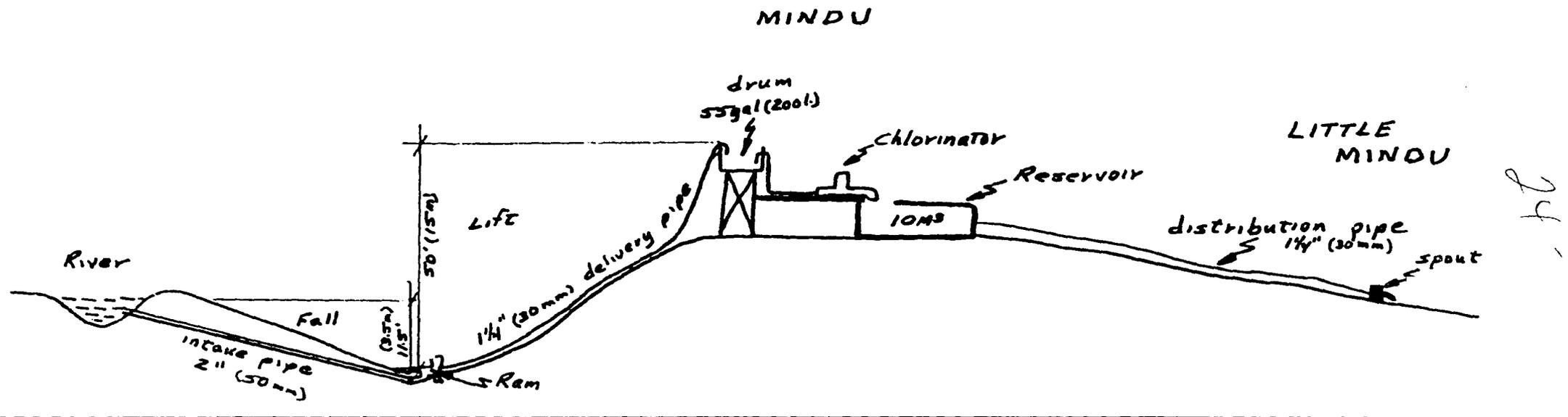
Bunea Top

Bunea Bottom



Daniel Mnemba

B-1: PROFILE OF MINDU NETWORK
(Not to scale)



SPECIFICATIONS

Ram - Commercial, RIFE # 20B

Water Source - 12 gpm (45 l/m)

Discharge - 1.8 gpm (9.8 m³/day)

Lift - 50' (15m)

Fall - 11.5' (3.5m)

Drive Pipe:

size - 2" (50mm)

length - 80' (27m)

Delivery Pipe: (PVC)

size - 1 1/4" (30mm)

length - 900' (275m)

Siphon Tank - 55 gal (200 l.)

Reservoir - 2640 gal (10 m³)

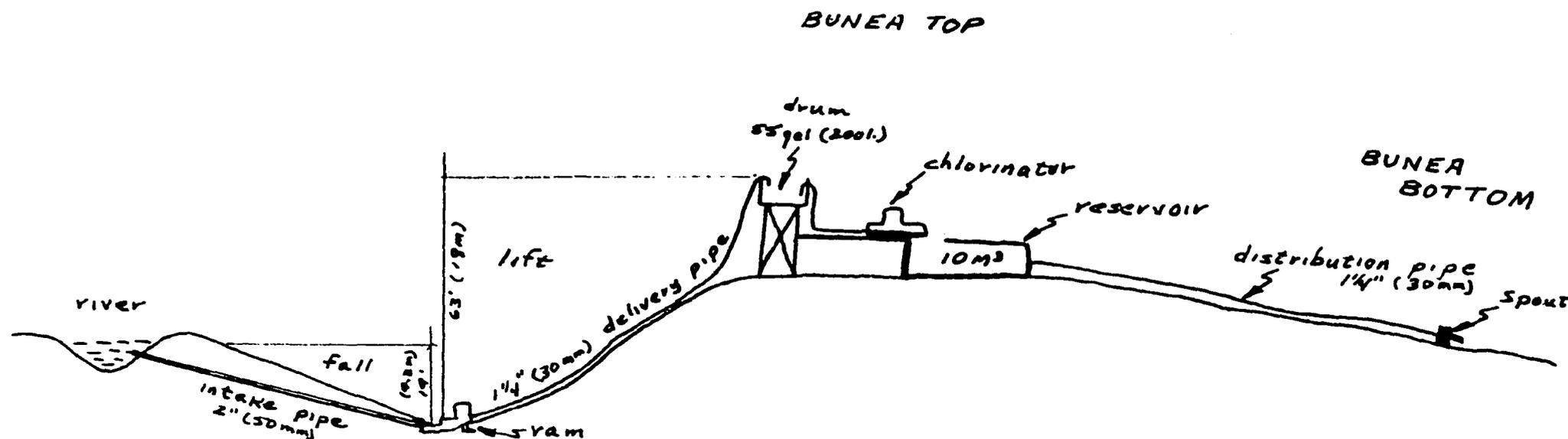
Distribution Pipe: (PVC)

size - 1 1/4" (30mm)

length - 3,900' (1190m)

Daniel Mnemba

B-2: PROFILE OF BUNEA NETWORK
(not to scale)



SPECIFICATIONS

Ram, Commercial RIFE #20B

Water Source - 14gpm (53/l/min)

Discharge - 2.1gpm (11.4m³/day)

Life - 63' (19m)

Fall - 14' (4.3m)

Drive Pipe:

size - 2" (50mm)

length - 122' (37m)

Delivery Pipe: (PVC)

size - 1 1/4" (30mm)

length - 1200' (366m)

Siphon Tank - 55gal (200l.)

Reservoir - 2640gal (10m³)

Distribution Pipe: (PVC)

size - 1 1/4" (30mm)

length - 2700' (824m)

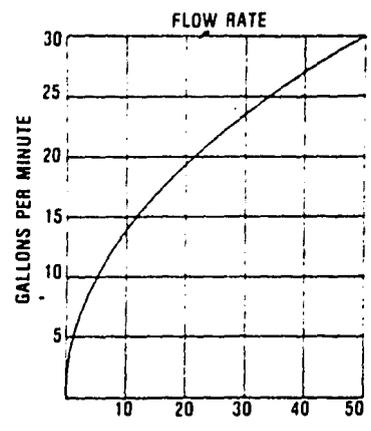
Daniel Mrema

26

C CHLORINATOR-MODEL 050

The WATER-SURE 050 is a siphon-activated chlorinator for use on rudimentary water systems, i.e., from hand-pumps, buckets, open channels, etc. This unit, when supplied with water, is capable of disinfecting at a rate of 7 to 30 gallons per minute.

- A. Dimensions: Length - 20"
Height - 13"
Width - 7"
- B. Weight: 4 lbs.
- C. Inlet Size: 1 1/4" siphon arms
- D. Exit Size: Exit port free-fall



WATER-SURE unit, inside siphon arm (26"), outside siphon arm (27"), siphon connection, chlorine test kit, instruction manual, Start-up supply of calcium hypochlorite.

TYPICAL INSTALLATION:

