A GUIDE TO COMMUNITY TRAINING IN MANAGEMENT AND MAINTENANCE OF GRAVITY-FED COMMUNITY WATER SUPPLIES

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WHO WILL USE THIS GUIDE

This guide is intended for use by everyone involved in project management at the community level including planners, researchers, project staff (NGO's and Government), committee members and the general community. The topics for discussion as outlined in this manual arise from field experiences especially in Baringo District. However ideas from other water projects have also been incorporated.

In using this guide, it will be necessary to bear in mind the dynamic nature of community development in different environmental settings and hence the need for adaptation of these topics to suit specific community aspirations.

In this respect, it is important to remember that some of the topics here may not necessarily apply to all communities; some may be deleted while new topics may need to be included to create the necessary relevance to reflect the socio-political and cultural attributes of different communities.

It is appreciated that the manual may not deal exhaustively with all the areas of community management and maintenance of water supplies. This would otherwise swell the guide to a volume that may discourage the readers. We shall welcome comments and suggestions in regard to content and presentation of the manual which we hope to include later in a revised version.
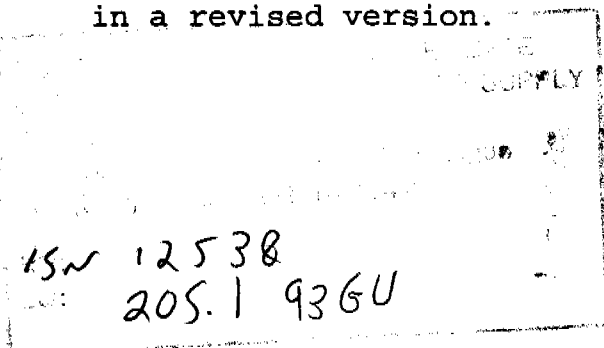
ACKNOWLEDGEMENTS

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PREFACE

The objectives of the International Drinking Water Supply and Sanitation decade (IDWSSD) (1981-90) which included the use of low cost technology, community (especially women) involvement, cost recovery, health/hygiene education and, Inter-agency collaboration have been popularly accepted across the world. However, there seems to exist some differences in the degree to which each of these principles has been implemented and the resultant practical experiences. Among the principles that have had minimal impact are community involvement (participation) and education. Their success would ensure empowerment and capacity building within the community thereby creating effective and efficient systems for the management and maintenance of water supplies. This manual, though not exhaustive, sets out to fill the under-mentioned gap.

In Kenya, management and maintenance of water supplies is carried out by various individual agents of change namely the community, the government, NGOs and Local Authorities. Where water supplies activities are undertaken by various collaborating agencies, these may be uncoordinated thereby creating an imbalance, confusion and duplication all of which may constrain the overall

project success. In such cases, the beneficiaries (community) may lose the ownership and control of (what is) their project.

Efforts by the government to decentralise these projects in line with the District focus for rural development where project owners will control the project activities and enjoy resulting benefits has been received with much enthusiasm. However, the rate at which new projects have come up is higher than comparable management and maintenance education given to the beneficiaries. Again a large proportion of rural population lack or have low basic management skills as well as technical capability.

While tremendous achievements in the area of policy formulation have been realized, objectives for community participation have not been fully incorporated into the practice of technical agencies. This results from a misconception that communities cannot attain adequate capacity to undertake technical aspects of the project capacity. There have also been cases of personalization of projects by a "clique" of influential local leaders who distort/misdirect resource allocation by overruling community decisions thereby stifling community participation.

Community training in management and maintenance of water supplies is an inseparable and crucial tool for improving community water supplies. If this principle is not adequately accommodated, water (and other) development projects will be a burden rather than an asset to the beneficiaries.

INTRODUCTION

Training in community management and maintenance of water supplies is a process which empowers communities to creatively innovate and seek ways of solving identified problems/needs. This training is conducted within the project area during which various activities namely: Awareness creation, Organization and Management; Operation and Maintenance and; Monitoring, Evaluation and Follow-up, are considered as integral parts of a process which calls for decisions made and actions taken within and by the community in consultation with external advisory agents. During all these activities, attention and respect should be paid to traditional values, norms and indigenous knowledge systems of that particular community in question.

The process is a bottom up and non-directive approach to community development where the training begins with the whole community awareness creation then the water committees and technicians and ends again with the whole community (participatory monitoring and evaluation).

LEARNING OBJECTIVES

This manual describes the steps and contents when one is carrying out community training in management and maintenance of self-help water supplies.

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After going through this manual, one should be able to define
the roles of the various players: Community, committee,
government, eternal agencies and interested groups using the
flow chart below:

Fig 1: FLOW CHART

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┌─────────────┐   ┌──────────┐   ┌──────────┐   ┌──────────┐   ┌──────────────────┐
│ Project     │   │ Planning │   │ Community│   │ Imple-   │   │ Organization and │
│ Identification├─│ and      ├───│ awareness├───│ mentation├───│ Management training│
│ and acceptance│ │ Design   │   │ creation │   │          │   │                  │
└─────────────┘   └──────────┘   └──────────┘   └──────────┘   └──────────────────┘
       │                                                                 │
       │                                                                 │
┌─────────────┐              ┌──────────┐              ┌──────────────┐
│ Expansion   │              │ Monitoring│             │ Operation and│
│ Replication ├──────────────│ Follow-up ├─────────────│ Maintenance  │
│ sustainability│            │           │             │ training     │
└─────────────┘              └──────────┘              └──────────────┘
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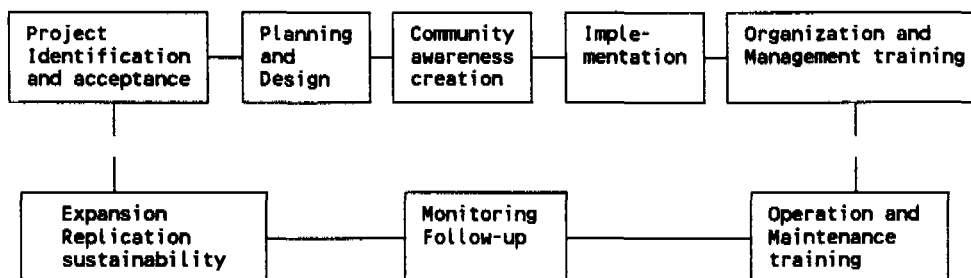
The guide is divided into four districts, but closely linked,sectors:

Part 1   Awareness creation

Part 2   Organization and Management

Part 3   Operation and Maintenance

Part 4   Monitoring, Evaluation and Follow-up

PART 1:

1.0 AWARENESS CREATION

1.1 Introduction

This activity is conducted as the first training step and endeavours to involve all community members and their leaders. Awareness creation is important as an informative activity where existing issues within the community are discussed and as much as possible consensus reached. Through participation, all community members gain access to and provide crucial information on project activities by openly and democratically expressing their views.

Awareness creation involves community mobilization, sensitization and identification of community (training) needs. It should be conducted before the start of the project so that beneficiaries may know about its existence, express their support/rejection contribute, publicize, and mobilize resources to meet some foreseen constraints.

For the facilitators this activity requires excellent performance as it is his/her entry point and build-up for other activities (organization and management; Operation and Maintenance and; Monitoring, Evaluation and follow-up). The approach

of the facilitator should therefore be friendly and
accommodative to the ideas of each community member.

1.2   Mobilizing the Community

The trainer will first brief community leaders and
administrators (the chief, assistant chief and
opinion leaders) in informal and formal meetings.
An earlier visit could arrange for such a meeting
and update leaders and the water committee on the
training dates. Community leaders/administrators
will then call meetings specifically for the
training activity or invite the trainer to public
"barazas" convened for other activities (harambee,
etc). This second option is chosen especially where
communities are economically/socially busy. In
other cases, market days could be used for awareness
creation - (mainly at the peak hour of the day)
where leaders, and not the trainer, call the
attention of all buyers and sellers present. This
exercise could also be used as a forum for the
selection of a committee, if none existed before.

Awareness creation meetings are conducted within the
project area (to allow all community
members/leaders to attend) at venues chosen by the
community. Where it is difficult to get all
community members together, different venues may be

chosen where same contents are covered/discussed in each. Besides formal discussions on meetings, informal discussions with individual community members/leaders may be held (e.g during evening tea at local kiosk and home visits). Community records and/project status, should be observed in order to discover weaknesses/strengths, problems, recommendations and solutions identified earlier by other outside agencies or the community itself.

1.3 Contents to be discussed :
These will vary depending on each community's requirements and the projects environment. However the following should be discussed, understood and as much as possible consensus reached:

1. Project ownership.
2. Project responsibilities and obligations (in terms of daily administration, operation, repair and maintenance).
3. Cooperation among all community members in accomplishing all project activities.
4. Leadership skills and structural formations.
5. Popular participation. What are the acceptable forms of community action? Who should be or not be involved?

6. Rules and regulations to govern/governing community water projects.

7. Fund raising strategies for operation and maintenance.

8. The role of community leaders, GOK, external agencies and community/committee in project activities - at a general level.

9. Problems associated with increased/insufficient water supply, improved hygiene, and sanitation practices (mainly) preventive/PHC methods) - transmission and prevention of water-borne water-based and water-related diseases.

10. Self reliance (with minimal outside dependence where necessary) within the community.

11. The relevance of a formal committee/equally representing all geographical areas covered by the project.

12. The need for training in organization and management, operation and maintenance and; monitoring Evaluation and follow-up.

13. Community training needs - this could be gathered by asking various questions such as: "What do you consider to be the major training needs required for effective and efficient management and maintenance of your project?" "Who should be trained?" etc.

14. Agreement is reached on training logistics - venue, time, etc.

At the end of this activity, the community is allowed to decide whether or not to effect changes in the existing committee number or structure.

1. **Suggested duration - 3 days**
2. **Suggested interval between awareness creation and organization and management - 7 days**
3. **Participants - all community members, leaders, administrators and the public at large.**

PART II

2.0 Organization and Management

2.1 Introduction

Organization and management may be conducted as a workshop in a class, church building, or under a tree with frequent outdoor (field visit) activities. The committee, community leaders, community based GOK personnel (e.g CDA, PHT etc) and some willing volunteer members make up the participants in the activity.

At the onset of this activity, trainees are stimulated to take an active part in the whole training process. To ensure this, the trainer should lay a firm foundation on the extent and importance of the beneficiaries taking over the management and maintenance of community water supplies. At this stage, it should be pointed out that the approach where communities manage and maintain their water supplies is not new as communities have managed their traditional water sources for a long time. Discussions on the scope and effectiveness of management and maintenance of projects by the beneficiaries should be in relation to similar project examples (e.g women groups, schools, etc) within the area.

Organization and management should build upon ideas
introduced or raised during awareness creation and
others which the committee may consider important in
her endeavour to efficiently and effectively manage
their project.

2.2 The Approach of the Trainer(s)

In organization and management, the trainer's role
is that of a catalyst where he/she stimulates
participants to identify their needs and as much as
possible draw-up consensus to solutions. As such,
the trainer should do nothing which he can get the
trainee(s) attempt and do on their own.

Methods used to train participants in this activity
are informal - participatory, psychosocial and
experiential - which expose trainees to organization
and management realities within the shortest time
possible. In this case, role-plays, story-tales,
singing, observations, film watch, cassette
listening; exposure to "research" activities (field
visits), discussions, illustrations, lectures,
demonstrations and problem posing and solving,
techniques which have relevancy to the community,
are among the methods employed.

2.3 Contents to be discussed

In organization and management, the following contents should be covered:

1. Reasons for passing all project responsibilities in terms of daily administration and maintenance to the beneficiaries.

2. Background to community participation, the current examples of successful community participation in the area and possible hindrances to full realization of this attempt.

3. Definition of terms:
   i)   Community
   ii) Organization
   iii) Management
   iv) Development
   v)   Project
   vi) Participation, etc.

4. Water supply under-takers in the country (i.e ownership) and the institutional/organizational arrangement of water committees.

5. Leadership: choice, skills, structures, qualities and formations.

6. Roles of: the committee, committee members, officials, executive/nominated/co-opted members, community, NGOs, the GOK, and other parties/institutions to which the project may be inter-dependent.

7. Community motivation and mobilization (how and what factors motivate people to action).

8. Linkages with the GOK/NGOs and interaction with key external/internal institutions.

9. Collaboration: a way through which outside agencies become partners working (at intervals) with the community.

10. Co-operation - a process whereby individuals/groups join together to work towards certain goals and objectives.

11. Coordination and mechanisms for settling differences (conflict management) within the group(s) by harmonizing differing units/groups/individuals within the project.
    It is important here to point out that a concise and clear explanation should be made between collaboration, cooperation, coordination and linkages.

12. Communication skills, channels, barriers and feedback processes.

13. Basic book-keeping, recording procedures accounting:
    i)   Project books required
    ii) Official letter writing
    iii) Minute writing
    iv) Filing, etc.

14. introduction to monitoring, evaluation and follow-up of community water supplies.

15. Planning

16. Plan of Action

Note: Some topics can be deleted while
         others could be added depending
         on the training needs analysis.

Suggested duration - 8 days

Suggested interval between organization and
management and operation and maintenance - 14 days.

Participants - All committee members, community
leaders and few volunteers (only a small group of
about 12 people).

PART III - OPERATION AND MAINTENANCE

3.1 Introduction

In this activity, the community will determine who will be responsible for repairs and maintenance of their water projects. In this case, two options are open to them (community):-

i) Direct employment of a technician(s). In this case, the training agency will test the suitability of the candidate(s).

ii) Identify and select community representatives for this training - the number of trainees depends on how many the particular community can mobilize in consultation with the trainer.

A combination of these options may apply later in practice depending on the arrangement by the community and also depending on the sophistication of maintenance (especially repairs).

3.2 Contents to be covered

The contents to be covered during this activity will depend on the construction stage of the project. In general, the following contents should be covered:

1. Water supply and human health: diseases related to deficiencies in water supply and/or sanitation.

2. Water supply policy (current and future plans)

3. Present water supply situation

   i. Legal administration of water - the water Act

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ii. Water supply undertakers - City Commission, Municipal Councils, Town Councils, urban councils, county councils, institutions (schools), Kenya Railway Cooperation, Missionaries, Ministry of Land Reclamation, Regional and Water Development, National Water Conservation and Pipeline Corporation, water supply association (self-help and private sector.

iii) Water supply systems (lake, river, dam, gravity water, earth etc) and managing authorities (community, self-help,NGOs, local authority, MLRWD, NWCPC and donors).

iv) Water tariff (current) - where no meter, where a meter is installed, where water is sold to a licensed retailer, where water is sold by retail at a kiosk per unit of 20 litres and bulk sale to an undertaker for resale per cubic meter.

v) Water tariff collection for operation and maintenance.

4. Water sources

i) Water supply and hydrology (see figure 2)

ii) Quality of water sources: Rain water, springs, etc.

5. Water treatment: Water treatment processes, chemicals used for treating water (Aluminium sulphate, ferric chloride, chlorine, iodine, soda-ash, boiling of water and potassium permanganate).

6. Operation and maintenance: i) diagrammatic
    illustration of the scheme (see figure 3 and 4).
    ii) Pipeline material (cast iron, galvanized
    iron/steel, asbestos cement, polyving chloride and
    polythene) and suitability.
    iii) pipe fittings: bends, elbows, springs, kinds
    of tees, kinds of reducers, nipples, sockets, plugs
    and caps, flange and V J Coupling, valves, brass,
    gate valves, cast iron gate valve, check valve - non
    return valve (swing type), air release valve (Air
    valve) and washout valve.
    iv) Tools for pipe work: work benches, holding
    devices, benchvice, pipevice, chainvice, cutting
    tools (pipe cutter and hacksaw), thread tools
    (dies/stock - for external thread, and taps and
    handle - for internal thread), measuring tools (tape
    measure, folding rules, etc), assemple/disassemple
    tools, chain wench, adjustable spanner,
    miscellaneous (threading machine, bending machine,
    bench grinder, angle grinder, arcwelding, gas
    welding).

7. Repairs and Replacement of parts of the system:

    i) pipeline
    ii) Valves
    iii) Replacement of screens

8. Maintenance and cleanliness of:

    i)   Intakes

    ii) Pipelines

    iii) Tanks

    iv) Water points

9. Stores and Security.

10. Identification of pipe fittings:

    i)   Use of stock and die for threading GI pipes

    ii) Cutting pipes

    iii) Estimating pipes and fittings

11. Areas needing immediate attention (e.g training, project completion etc.) are then assessed.

    In this activity, practical sessions should be given priority. These should be conducted from the water intake point along the pipeline through storage tanks, water kiosks, machinery used in booster stations to distribute lines and household connections. During the exercise, trainees should be asked to identify various project features and explain how they would tackle different parts of the system.

    At the same time, community technicians should be furnished with the information on sources and availability of spare parts and their current market

prices. Information on extension services and their
accessibility should also be given.

> **Suggested duration - 7 days**
>
> **Suggested interval between operation and**
> **maintenance and monitoring and follow-up -**
> **90 days**
>
> **Participants - community selected/employed**
> **technicians.**

PART 1V

4.0 MONITORING, EVALUATION AND FOLLOW-UP

4.1 Introduction

In these activities, achievements, fairness,
obstacles, solutions and other factors related to
project work (which determine attainment of set
goals, objectives and aspirations of the community)
are outlined and further efforts to improve
performance suggested. The aim is to assess the
training impact, fairness, achievements and
problems/obstacles impending project progress.

4.2 Community Participation

Monitoring, evaluation and follow-up should involve
all the beneficiaries and thereby help them to learn
and understand sources of failures, obstacles,
constraints and bottlenecks and how to approach

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similar adverse effects in future. This
participatory approach is meant to enhance the
community's capacity thereby enabling them to
successfully face the future with more confidence.
In these activities, as a part of beneficiary
involvement and participation, the committee and
community technicians present their experiences in
the project since the last training package
(operation and maintenance) and possibilities of
improving the performance are then discussed. The
trainer or outside agency further evaluates the
projects performance through observations of visible
and variable entities such as pipe leakage, improved
health and hygiene/sanitation practices, recording
procedures etc.

Besides the committee and technicians, the general
community meets for at least one day to air their
views, grievances and suggestions concerning their
project.

4.3 Main issues in monitoring, evaluation and Follow-up

The main contents to be measured/observed are
determined in advance. Particularly, the committees
plan of Action drawn up during the organization and
management is the major determinant of
success/failure. In the case of gravity-fed
community water projects, the following entities

considered crucial to project success should be
taken into consideration:

1. Formation/composition and any changes within the committee

2. Project books and tools purchased/owned by the community.

3. Recording and accounting procedures.

4. Changes in the total number and compensation of people participating in communal work.

5. Frequency of committee/community meetings.

6. Monthly/quarterly (reporting) progressive reports written.

7. Present financial status and fundraising strategies implemented.

8. Registration of the project with the Ministry of Culture and Social Services and operation of a bank account.

9. Improvement of hygiene and sanitation practices e.g construction of latrines, washing clothes away from stand pipes/water intake points etc.

10. Rules and regulations formulated and implemented.

11. Project (physical) work completed e.g intake desiltation, pipeline extension etc.

12. Education and training activities sought and conducted by the community/committee.

13. Storage procedures of project materials and stores security.

14. Pipeline maintenance and repair status.

15. Community's collaboration efforts with external/internal (GOK, NGO's, etc.) agencies (Village Health Committee, Village Development Committee etc.).
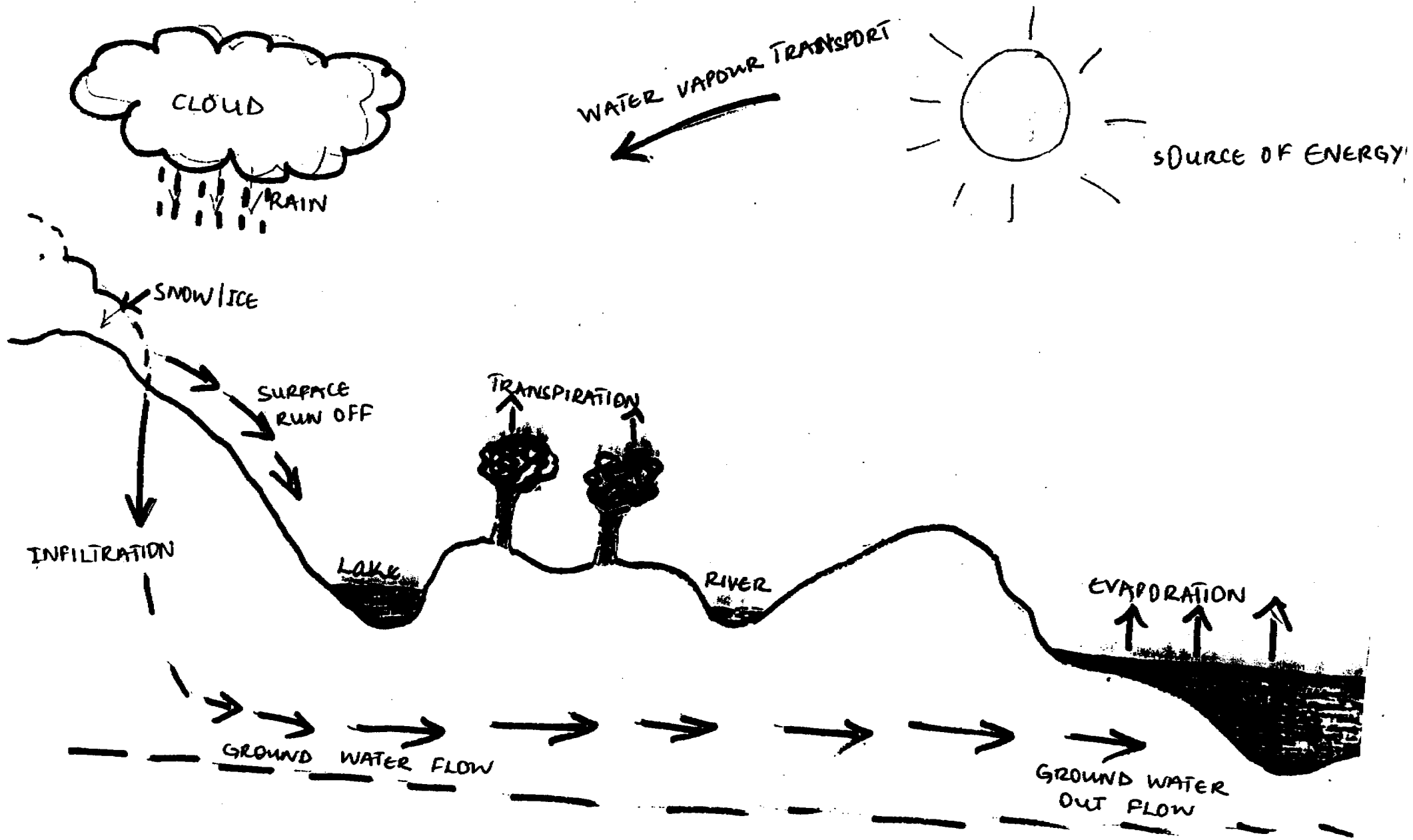
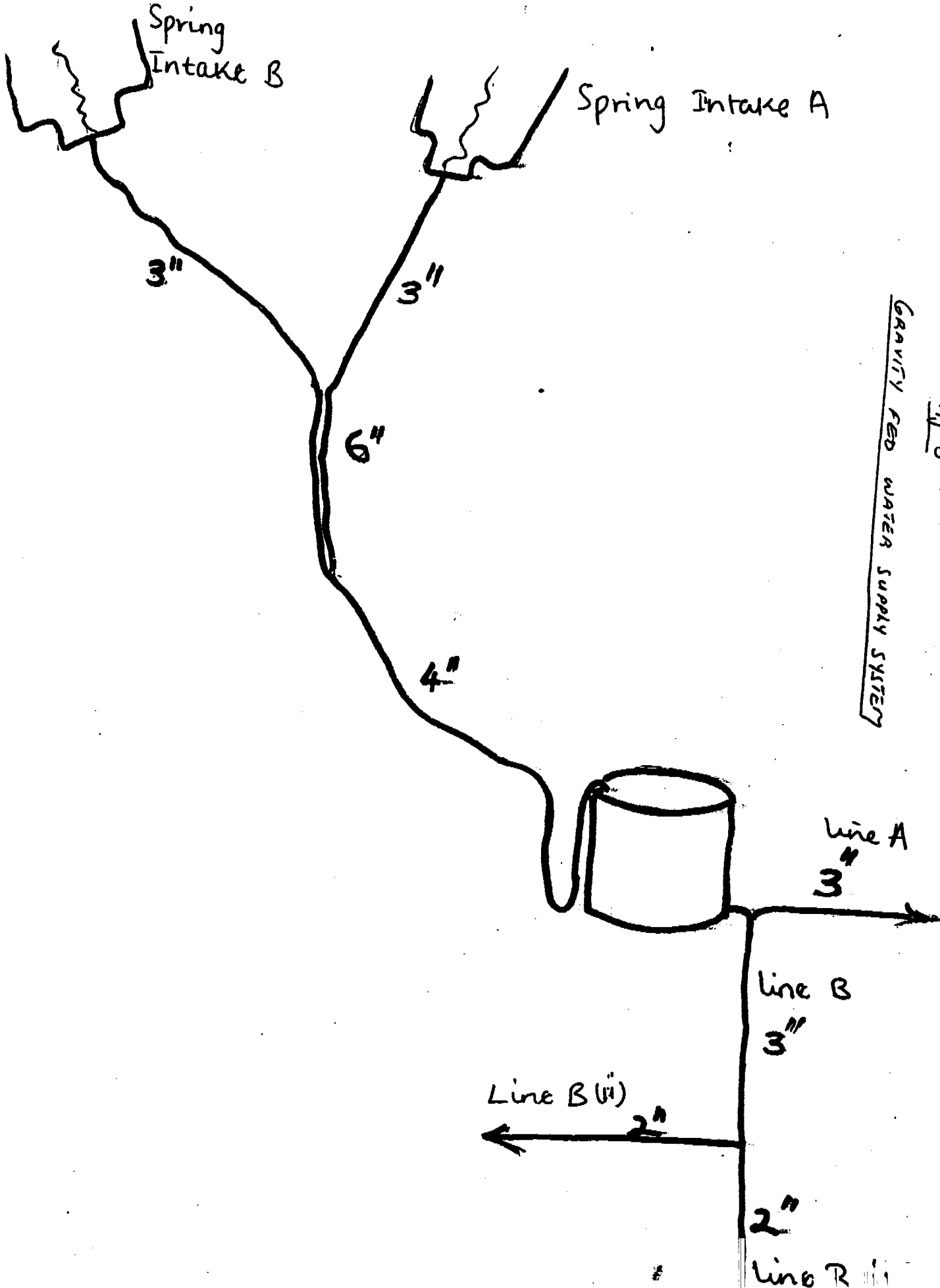16. Census of all people and institutions to be served by the water project.

17. Future plans of the community.

CONCLUSION

Community based programmes should put more emphasis on management and maintenance of the project by beneficiaries. The achievement of this idea will be through education which stimulates committees to innovatively handle their environments effectively and more efficiently - where ideas and resources needed will be generated within and by the beneficiaries themselves. The objective is to empower communities to achieve self-sustainability in project management and maintenance thereby ensuring lifelong success and benefit of these projects.

Fig 2. Hydrological Cycle

CLOUD

RAIN

WATER VAPOUR TRANSPORT

SOURCE OF ENERGY

SNOW/ICE

SURFACE RUN OFF

TRANSPIRATION

INFILTRATION

LAKE

RIVER

EVAPORATION

GROUND WATER FLOW

GROUND WATER OUT FLOW

Spring
Intake B

Spring Intake A

3"

3"

6"

4"

94.0'

Line A

3"

Line B

3"

Line B (ii)

2"

2"

Line B (ii)

ARRANGEMENT OF PIPES/FITTINGS