Somali Natural Resources Management Programme

Local Level Natural Resources Monitoring and Evaluation:

Tools and Methods

By

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The Somali Natural Resources Management Programme is implemented by The World Conservation Union's Eastern Africa Regional Office (IUCN-EARO) and financed under the EC Rehabilitation Programme for Somalia

Project No. 6/SO - 82/95 + 6/SO - 83/04

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Executive Summary

This report elaborates the design of a local level natural resources monitoring and evaluation (M&E) system that assesses the status of the natural resources and the impact of development interventions on the status of the natural resources and the socio-economic systems of Somalia, using both conventional and participatory approaches, methods and tools. It incorporates the following:

- Ways to involve stakeholders in the M&E process;
- A process for identifying indicative issues to be monitored in the various production systems;
- A process for identifying indicators of change at local level in both the biophysical and socio-economic systems;
- Appropriate participatory approaches, tools, and methods for measuring changes in the selected indicators;
- A data storage and analysis system that harmonises the quantitative conventional monitoring data and the qualitative participatory monitoring data;
- A mechanism through which results of the M&E feed back into and strengthen the policy formulation, planning and management processes;
- Explores the linkages with macro level M&E system
- Requirements for implementation (personnel, training) are identified.

The following questions guided formulation of the system:

- what is to be monitored; why, what is the monitoring intended to achieve; for whom; what approach will be used?

The system is designed to monitor impact of projects on both the natural resources and people, and to meet the needs and requirements of various stakeholders involved in the Rehabilitation Projects. These include donors, project staff and local communities.

The proposed system builds on monitoring and evaluation methods and tools formulated and tested by IUCN and International Development Research Centre (IDRC), the principals of participatory planning designed by Andrew Inglis (IUCN, 1997) and the FAO's Community Forestry Manual 2 (FAO, 1993).

The proposed system has five components namely; needs assessment, baseline data collection, monitoring, evaluation, data analysis presentation.

1. Needs Assessment

Needs assessment is the act of determining what issues and/or problems need to be addressed by a project or community, and by which activities. It is achieved through the following steps:

- establishing the communities priority issues;
- participatory review of projects mandate and objectives;
- gender analysis, data analysis and presentation;

2. Baseline data collection

Baseline data collection provides a description and information of a current situation. It is done so that activities can be focused, and change can be measured by comparison with similar situations at a future time. It is achieved through the following steps:

- decide who will be involved in the baseline data collection;
- decide the issues and indicators for which baseline data will be collected;
- select quality indicators;
- establish baseline questions and a baseline team;
- select tools to use to collect baseline information;
- decide when information gathering will be done.

3. Monitoring and evaluation

Monitoring is the systematic measuring, recording and periodic analysis of data on performance of previously selected indicators, e.g. rate of soil erosion, rate of growth of trees/crops, kilograms of maize per acre, number of incidents of diarrhoea. Monitoring provides information during the life span of a project, and achieved through the following steps:

- review reasons for monitoring;
- develop monitoring questions;
- establish indicators;
- decide which information gathering tools will be used;
- decide who will take measurements and keep records;
- analyse and present results.

4. Evaluation

Evaluation is the action of stopping to reflect on the past data gathered during monitoring in order to make decisions about the future. It is time to stop and ask: "Was the time and money invested in the activities worthwhile?"; "Should we continue doing what we are doing?"; "What needs to change in the way we have conducted the project activities?" An evaluation can be undertaken using the following simple steps:

- preparation for an evaluation;
- review objectives and activities;
- review reasons for evaluation;
- develop evaluation questions;
- analyse and present results

5. Data analysis and presentation

Data analysis and presentation provide the link between monitoring and evaluation and policy formulation, planning and management processes. If results are not used to guide decisions the resources invested in evaluation, data gathering and analysis are wasted, and the link through which monitoring guides decision making is made ineffective. Often good results are not used because the presentation is not user friendly.

Simple steps to undertake each component of the system are outlined in the report and tools, including Map Maker Geographic Information System, are suggested and described.

Requirements for implementing the system

Personnel

There is need for projects implementing the system to assign a project staff member responsibility for monitoring and evaluation. Even though this person may undertake other duties, ideally s/he should dedicate a substantial amount of time to M&E. The danger of dedicating one person to M&E without other duties is that it may lead to isolation of M&E within the project and reduce chances of integrating it to all project activities. The person in charge of M&E should have training and experience in participatory methodologies in addition to disciplines related to the requirements for the project's main activities.

Resources

For M&E to be effectively implemented, it is important to have a supporting budget to purchase Map Maker software, training in participatory processes, computer operations and basic cartography. Other resources required will be a computer and Map Maker soft ware.

Challenges to the proposed system include the possibility of slowing down implementation because of involving many stakeholders including the community. Monitoring and evaluation is a long term process, and change occurring in resources may be at a spatial and time scale beyond the project control and duration, while projects have short funding cycles.

It is recommended that results of the M&E be shared through channels such as the EU led SACB (Somalia Aid Coordination Body) and its sub-committees, through workshops organised to specially learn from the lessons.

The system elaborated here is an ideal system. It is possible however to implement parts of it taking care not to compromise the quality of natural resources status and dynamics data collected.

Background

The IUCN Somali Natural Resources Management Programme, funded by the EC Rehabilitation Programme for Somalia, recognises that monitoring of Somali natural resources (vegetation, water, soils, etc.) is vital in order to provide information on the dynamics of the environment and contribute towards analysis of impacts on the livelihood of Somali people.

Much has been written and said on the ecological degradation of the Somali environment; the increasing extent of soil erosion, loss of trees, and marine resources. However, without quantitative and qualitative information on past status of natural resources there is little opportunity for categorically stating the extent and causes of ecological degradation in Somalia.

Ecological monitoring and evaluation (M&E) systems have been developed in several countries in the greater Eastern Africa region with the aim of assessing change in natural resources as a result of changing land use. These have traditionally been based on the use remote sensing technology by centrally-based institutions relying on international technical and financial support, and, increasingly during the 1990'ies, on low cost local level participatory methods involving resource users.

The current situation in Somalia where a central authority is yet to take form but where regional administrations exist, albeit with limited capacity, and where a significant number of rehabilitation and development activities are based on the access and use of natural resources, posses a challenge in re-introducing ecological monitoring and evaluation systems. The IUCN Somali Programme opted to explore the opportunities for monitoring and evaluation systems from two approaches: one based on remote sensing and the other at local level (i.e. village, ecological units).

The terms of reference guiding this activity (Annex 1) required for a local level natural resource monitoring and evaluation system based on both conventional and contemporary participatory methods. Conventional natural resource monitoring and evaluation systems however, are largely based on ecological monitoring and evaluation methods that concentrate on measuring ecological indicators. The application of such systems in Somalia today has several shortcomings:

- The primary aim of such monitoring and evaluation systems is to provide information on ecosystems structure, processes and functional relationships. While such information enhances understanding of ecosystems precise spatial and temporal variation in properties and responses to impacts, it often fails to provide understanding of human activities likely to alter the ecosystems and the ecological processes. Given the inherent fragility of the natural resources of Somalia, and the civil strife driven changes in use patterns, it is more important to understand the human activities likely to alter the ecosystems and ecological processes than to understand ecosystems structure, processes and functional relationships. Improved resource use planning should be based on such understanding;
- Such systems tend to generate massive information that is not always easily accessed to, and/or interpreted by planners. There is need in Somalia today for easily accessible and useably information to alleviate the current shortage of easily available information on natural resources and their use, a purpose that cannot be served by a conventional M&E system;
- As demonstrated by examples from northern Kenya[1] and Somalia[2] such monitoring systems require a large capital outlay in the form of technical personnel, equipment, and national institutions to support them, currently lacking in Somalia. Many Somali National institutions collapsed after the break-out of civil strife in the early nineties. Where peace is emerging, such institutions are also emerging, but are faced by problems of inadequate human and financial resources.
- The usefulness and sustainability of conventional M&E systems in the region is questionable as they have failed to attract and sustain continuos funding. Somalia is no exception to this.

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[1] Monitoring and evaluation undertaken in Central Turkana by TREMU (Turkana Resources Monitoring and Evaluation Unit), 1986 to 1992.

[2] Monitoring and evaluation work done in Somalia Rangelands by RMR Ltd. (Resource Management and Research) from the mid-seventies to the early nineties.

The investment (human, capital and financial resources and institutional set-up) required to implement a conventional monitoring and evaluation system cannot be justified in Somalia today. To overcome this, two possible opportunistic ways of monitoring natural resource condition and use are:

1. Macro level monitoring using data collected through remote sensing. Several institutions in the eastern Africa region are acquiring and analysing remote sensing data, e.g. The Food Security Assessment Unit of the World Food Programme and the United Nations Food and Agricultural Organisation funded Drought Early Warning System. A macro level M&E system which uses a combination of data from both remote sensing and ground surveys, and GIS for data analysis and storage has been designed under the IUCN Somalia Programme (IUCN, 1997).

2. Micro (local) level monitoring using qualitative and quantitative data collected by staff of existing externally funded field projects, in collaboration with local resource users. Several INGOs (International Non-Governmental Organisations) are currently undertaking rehabilitation and development initiatives at the local level, increasingly based on participation of the rural people in identifying, planning and management of interventions. Such rehabilitation work may be going on in absence of real data on the resources and socio-economic systems. Such projects provide an opportunity to apply participatory and non-participatory methods to collect qualitative and quantitative monitoring and evaluation data using existing staff and resources. This system has the following advantages:

    - By focusing on both natural resources and the resource users, it will not only allow understanding of dynamics of the resources but also provide a link between natural resource status, production systems (livestock rearing, agriculture etc.) and the social well-being of the Somalis;
    - M&E is often opposed because it may take up too much time and resources. The more external the process is to the project partners, the more it will be opposed. The proposed system is designed as an internal project activity, applied within the context of the Rehabilitation and Development Projects and is therefore cost effective;
    - By incorporating participatory methods of community mobilisation, assessment, monitoring, etc., the system will strengthen the participation of local people in the project activities, promote ownership and contribute to sustainability;
    - Involving communities dependent on natural resources will provide an insight into natural resources considered important at the local level; information that may not always be available to national and regional level natural resource planners;
    - Unlike conventional M&E systems that are designed largely to meet the needs and requirements of donors, this system is designed to meet the requirements of the majority of stakeholders, especially the external project staff and beneficiary community members;
    - It can be applied as an integral component of environmental impact assessment (EIA) to monitor impacts of any mitigating actions.

Background to IUCN's involvement

A U.K based consultant was hired in July 1997 to work together with a staff member of the IUCN Somali Programme. Extensive literature search on the subject was conducted both in Nairobi and UK, complemented by discussions and consultations with colleagues in IUCN and staff of INGOs (International Non-governmental Organisations) in Somalia. A draft system was elaborated and tested in Hayayabo village, Boroma District, Awdal Region in early July 1997 (see itinerary, Annex 2). Following the initial testing, the M&E system was refined and re-tested in Haraf village, Hargeisa District, Galbeed Region, in mid-July 1997 and a final draft presented at a workshop in Nairobi in early November 1997. Comments and suggestions from the November workshop, and from colleagues within IUCN were incorporated in the final proposed system (see itinerary, Annex 2). The system proposed was the subject of a wider training on participatory approaches held in Berbera, "Somaliland", in September 1997.

The system proposed has borrowed heavily from the tools and methods of assessing progress towards sustainability formulated by IUCN and the International Development Research Centre (IDRC) expert team (IUCN M&E, 1997). The methods and tools were developed in the field and tested in Africa, Latin America and India at regional and local levels. This report has quoted liberally from the teams work, sometimes without direct reference to enhance readability. It has also borrowed heavily and indeed incorporated many aspects of the following documents: FAO's

Community Forestry Field Manual 2 (FAO, 1993) and Innovative Participatory Methodologies for Environmental Interventions at the Community Level (IUCN, 1997).

Section one of this report provides an overview on monitoring and evaluation and the theoretical basis for the proposed system. Section two gives a brief overview of monitoring and evaluation in the context of Somalia. Section three describes the elements of the proposed system for Somalia. Section four contains the following Annexes:

Annex 1 - TORs guiding the activity

Annex 2 - Itinerary

Annex 3 - References

Annex 4 - Description of tools recommended for use with the system.

Annex 5 - Field testing of the proposed local level monitoring and evaluation system

Annex 6 - A sample of ecological issues for monitoring and evaluation

1.0 Introduction

1.1 What is Monitoring?

In general terms, monitoring is the process of systematically reviewing progress against planned activities and targets. Monitoring has a more specific meaning when applied to natural resources monitoring and evaluation, where it is the systematic collection of data on ecological indicators of ecosystem structure, processes and functional relationships. Whatever the application, to monitor is to observe, measure and record performance of indicators of condition, actions, process or trends (modified from Jackson, 1997).

1.2 What is evaluation?

Evaluation is the periodic assessment of relevance, performance, efficiency, and impact of the project in the context of its stated objectives. It is the objective assessment of the relevance of the results of monitoring (Further details in section 3.4).

1.3 Types of M&E

There are two issues on which categorisation of monitoring and evaluation can be based. These are: What is being monitored and evaluated (compliance or impact) and, the approach to monitoring and evaluation.

1.3.1 What is being monitored and evaluated

- **Impact (system) monitoring and evaluation:** An evaluation of the impact of human activities, including projects activities, on the natural resources and people. It asks the questions: "What is the impact of our project (implementation and achievement of goals) on the ecosystem structure, processes and functional relationships?"; "What is the impact of our project (implementation and achievement of goals) on the welfare of the local communities?" Depending on the level of activities, impacts can be measured at local, regional or global levels, using a combination of tools and methods.

- **Project monitoring and evaluation:** An internal evaluation of the conduct and results of a project or a discrete set of activities, achieved by asking the following questions:
    - effectiveness: have we achieved planned results?
    - efficiency: could the same results have been achieved with less financial and human resources?
    - relevance: are results significant to the situation we are attempting to influence/address?
    - impact: did the results make a difference to the situation/issue we are attempting to address?

- **Institutional self monitoring and evaluation:** An internal reflective process to evaluate organizational capacities to implement a mission and/or goals. Achieved by asking the following questions:
    - What is our mission and why;
    - What are our goals and why? ;
    - Do our goals reflect our mission?;
    - Are we organised to achieve our goals and mission?

  Imbach (1998) suggests that institutional self M&E should include an internal assessment that examines the following:
    - strategy including constituency, vision and mission;
    - structure including structural organization, governance, decision making;
    - operational systems including finance, communications, human resources, monitoring and evaluation;
    - people, their skills attitudes and knowledge;
    - culture including norms, values and traditions;
    - programmes.

1.3.2 Approaches to M&E

Monitoring and evaluation can also be classified based on approach used to implement it. Jackson (1997) described two different approaches; summative and formative.

- **Summative evaluation**: This refers to project-context evaluation undertaken towards or after the end of a project by external "experts" to assess how the project has performed in terms of effectiveness and efficiency, and to provide lessons for future projects and programmes. It usually involves an initial baseline study and monitoring of indicators to measure change over time (Parmesh et al., 1993). This approach to monitoring and evaluation has the following limitations:
    - detailed identification of baseline indicators depends on existence of baseline information and presents problems as it is difficult to account for unintended consequences;
    - does not help with the recognition of problems during implementation and in particular can result in loss of opportunities to maximise benefits and minimise unintended consequences;
    - it does not guarantee that you will be able to identify causal linkages between activities and change;
    - a reliance on external evaluators does not promote local ownership or skills.

- **Formative evaluation:** This approach refers to continuous evaluation, identifying issues as they emerge, taking corrective or compensatory action, building on success and minimising negative consequences (Fisher et al, 1996, in Jackson 1997). In the context of a project, formative evaluation may involve a final evaluation at the conclusion of the project. In the context of ecological monitoring and evaluation, it involves constant measurement of indicators. This form of evaluation helps identification of negative consequences, constraints and opportunities as they emerge and thus provides opportunities for corrective action.

Both summative and formative can be either participatory or non-participatory.

- **Participatory monitoring and evaluation:** This refers to involvement of stakeholders in the various aspects of M&E, from the process of systematically reviewing progress against planned activities and targets, the observation and recording performance of the process being monitored, identifying indicators to be monitored, to the process of evaluation. Participatory planning has its origins in methods collectively known as PRA (participatory rural appraisal). First tried in both Kenya and India in the mid eighties, PRA quickly spread to other areas and has become a major tool for community mobilisation for development. Application of PRA methods in monitoring and evaluation is primarily a means to pass responsibility for monitoring natural resource use and project investment to resource users. Transparency and a sense of ownership to the process are the strong points of participatory monitoring and evaluation.

- **Non-participatory or passive involvement monitoring and evaluation:** This refers to the exclusion of stakeholders in the process. Monitoring and evaluation is done for them, not with them. Lack of both transparency and a sense of ownership hinders understanding of the monitoring and evaluation process by the stakeholders, thereby reducing the potential of learning from it.

1.4 Importance of M&E

Monitoring and evaluation is an important part of the project cycle, and in particular planning. Where the results of monitoring and evaluation feed back into, and strengthen decision making processes, it guides action and action informs it. It is therefore an important tool for learning, which helps people, projects and institutions to learn as they act and therefore act more effectively (Fig. 1).

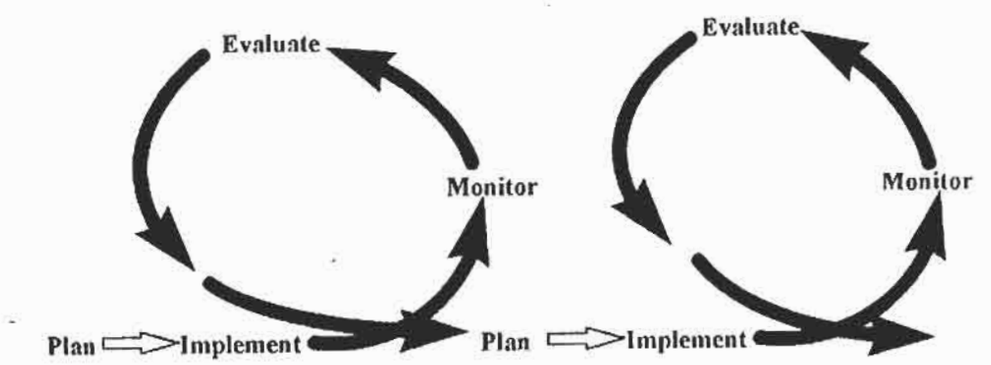


Fig. 1. The monitoring, evaluation and planning cycle

2 DESIGNING A MONITORING AND EVALUATION SYSTEM FOR SOMALIA

In designing a monitoring and evaluation system for Somalia the following questions were used as guidelines:

- What is going to be monitored?
- Why? What is the M&E going to achieve?
- For whom? Who will be involved in the process and who will use the M&E results?
- How will the M&E be conducted? What approach will be adopted?

2.1 What is going to be monitored

The M&E system will monitor the impact of projects on the natural resources and on the livelihood of the people in Somalia. This is a system (impact) monitoring and evaluation distinct from project and self M&E. It is relevant to Somalia because it will provide important information on the local level impact of a project (implementation and achievement of goals) on the environment and the welfare of the local communities.

2.2 Why? What is the M&E meant to achieve?

For Somalia, M&E will contribute to:

- fulfil the role of monitoring and evaluation namely:
    - provides lessons through which the stakeholders learn, thereby improving their management skills;
    - provide guidance to project implementation, allowing lessons learned from the process to guide further activities.
- fill the existing information gap by providing information that will allow understanding of:
    - the status and dynamics of natural resources;
    - interaction of people and their natural resources;
    - the impact of this interaction on the resources;
    - communities perception of important resources.
- strengthen participation of communities in project implementation by ensuring that technical expertise, people's feeling for their culture, knowledge and understanding of the programme/project are harmonised thereby increasing the value of the project to the people. This will contribute towards sustainability of the projects/programmes.

2.3 For whom? Who will be involved in the process and who will use the M&E results?

The proposed system is designed to involve and meet the needs and requirements of various stakeholders involved in Somalia rehabilitation and development projects. These include donors, project staff and local communities. The system proposed is therefore very systematic, yet simple, and combines use of both participatory and non-participatory methods and tools. It consists of six related steps (see section 3 below). Though it is ideal to engage all the steps, it is possible to start with any of the steps, so on-going projects can fit in. This is because circumstances surrounding a particular community and its needs are location specific, and each INGO has its own specialisation and funding limitations. The approach, tools and methods should be treated as a starting point to be used with creativity and adventure, and to be modified and improved to suit existing requirements.

2.4 How will the M&E be conducted, what approach will be adopted?

To maximise benefits from the exercise, it proposed that the M&E be formative and participatory. This enables results of the exercise to inform action and planning.

3.0 THE PROPOSED LOCAL LEVEL MONITORING AND EVALUATION SYSTEM

The proposed system consists of the following components:

1. Needs assessment;
2. Baseline collection;
3. Monitoring;
4. Evaluation;
5. Data analysis;
6. Data presentation.

In this section, each component is briefly described, *steps* in each component outlined and a list of possible *tools* suggested. The *tools* themselves are described in Annex 4.

3.1 Component 1: Needs Assessment

Needs assessment is the act of determining what issues and/or problems need to be addressed by a project or community, and by which activities. It is the process through which project staff find out whether they and the local communities hold similar views on the local communities problems, and whether the activities they propose to implement to address those problems are indeed practical and relevant, and whether basic conditions exist to support those activities. Identifying and/or defining the community (see box 1) to work with and a gender analysis to find out how gender relations will be affected or affect project success, are important aspects related to a needs assessment. Ideally needs assessment and gender analysis should be done by project staff together with the local communities.

The reality, however, is that in Somalia project objectives and activities are often decided without input from the local communities and sometimes without the input of the project field staff. Project staff are often recruited to support implementation of already planned and funded projects, and their is a high expatriate staff turn-over. Besides, each INGO has its respective mandate and funding limitations which often determine project objectives and activities.

Some INGOs oppose the principal of involving communities in needs assessment because local communities inevitably raise issues outside the mandate, and sometimes capacity of the project (or INGO) during the process. Undertaking a participatory assessment however does not necessarily tie the project/INGO to addressing all the issues and problems raised by the community. It however achieves the following:

- Allows project field staff to establish a rapport with the community;
- Involves a community at an early stage;
- Empowers the community by discussing their priorities and aspirations;
- Where the communities aspirations are different from the projects' mandate and objectives, it allows room for negotiation and conflict resolution;
- Gives the project field staff room to explain their mandate to the community thereby harmonising community expectations with the realities of the project's mandate;
- Provides information for the future which both the community and the project staff can use to negotiate for further funding.

It is therefore worthwhile for a project to invest in a participatory assessment to start on the right track with a community.

Box 1. What is a community? *(Adopted from FAO Forestry Manual)*

A community is a group of people, often living in the same geographic area and who identify themselves as belonging to the same group. The people in a community are often related by blood or marriage. They may all belong to the same religious or political group, class or caste. However, though communities can have many things in common, they are still very complex and should not be thought of or treated as one homogeneous group. They are composed of distinct interest groups such as landless and those with land, rich and poor, new immigrants and old residents, that influence decision making and participation in activities. Women may form a separate group in some communities. Project activities will affect and be affected by each grouping differently.

The importance of, and, steps for a participatory assessment developed for application in Somalia are provided by Inglis (1997). Needs assessment can be carried out using the following simple steps:

Step 1 Establish the communities priority issues

Technical solutions exist for many environmental problems, but are often a waste of time and effort if the local population is not committed to their implementation. To stand the best chance of success, any interventions (whether locally, externally or jointly implemented) should aim at improving aspects of the local environment which a significant proportion of the local people agree as being important. In order to determine what these local priorities are, it is best to have an open-ended process (Tool 1) which does not narrowly pre-define what constitutes the local 'environment' (i.e. does not restrict it to natural resources such as trees, rivers, sea, fish, water sources, wildlife, etc.) in order that the priorities which emerge are as unbiased by the facilitators as possible. This inevitably means that non-natural resource problems as well as natural resource problems will probably emerge from the process, but the resulting interventions will stand a better chance of solving local priority problems and achieving sustainable environmental management. Suggested tools for step 1 are listed below.

Possible tools for establishing community priority issues

Tool No.	Tool Name
1	Resource and Priority Issues Mapping for Assessment
	Secondary literature search

Step 2: Participatory review of the mandate and objectives of INGO and project.

It is important that the community understand clearly what the project can and cannot do. While step 1 allows the project field staff to listen to the needs and priorities of a community, step 2 allows the community to listen to the mandate and objectives of the project/INGO. Suggested tools for step 2 are listed below.

Possible Tools for Participatory Review of projects mandate and objectives

Tool No.	Tool Name
-	Semi-structured interviews
	Drawing and discussion
	Group meeting and discussion

Step 3: Gender analysis

In many societies, communities and/or villages, men often do different work from women. The type of work allocated to men and women differ from one community to another. Men may be responsible for fetching firewood in one village and not at all in another village. Women may be responsible for tending livestock in one village while they may not be in another village. Community and/or family owned resources are controlled by either men or women. Men may control farmland, water resources, forests, etc. in some villages while these may be controlled by women in other villages. Each community may have well defined rules and regulations of who controls what resources and who uses what resources and when. The different roles of men and women including male and female children is referred to as gender. In simple terms it is the sex-based division of labour.

Gender differs from sex because it refers to *who (which sex) does what work while* sex refers to *biological* differences between females and males. Sex is universal but sex based division of labour is not. A male child is a man universally but fetching firewood, baking bread, tending livestock etc. are male tasks in one society and female tasks in another society. A society, through culture determines who does what.

How do gender relations affect projects?

Projects seek to sustainably improve conditions for people and the environment, and distribute benefits equitably and sustainably. If we do not know who controls which resources and who does what in our target community, we cannot target appropriate interventions to solve the existing problems. For example an extension worker wanted to improve seed quality in a farming community by improving seed selection techniques. He planned to train "people" in seed selection techniques. He trained men because men attended his meetings and they showed interest. But seed care, selection and planting in that community is a woman's job. The results of the activity were:

- No effectiveness because seed quality remained poor and the skills imparted in men remained unutilised;
- No equity because women, who do the work, did not benefit from the training;
- No sustainability because men were trained to use improved methods for a job they never do.

Why is access and control important?
Access to a resource gives the individual freedom to use it, but on certain conditions e.g. time. Control of a resource means that the person makes the final determination about when, and by whom and how, e.g. women have access to family land (if they are married). Those who control this resource may determine how much each woman may use and how. Important questions regarding control include:

- What resources do women and men have for their work?
- Who has control over these resources?
- How will this access and control over resources affect, or be affected by project intervention?

Gender analysis is the study of village/community life to understand the roles of men and women in relation to what they do and what resources they have. It is a participatory planning tool to assist programme/project planners and institutions and target groups to identify major gender differences within the target group, gender specific constraints and opportunities for women's and men's participation in development projects and possible strategies and measures to overcome the constraints.

Key gender issues include the following:

- Division of labour;
- Access and control over resources and benefits;
- Decision making;
- Social-economic and environmental factors that determine 1 2 and 3 above.

A gender analysis should be undertaken during the assessment stage so as to determine whether:

- Any potential gender effects are desirable and consistent with programme objectives;
- Strategies and appropriate measures to ensure the participation and benefit of all people equally;
- Enhance programme efficiency, effectiveness and sustainability.

Gender analysis is also important during project implementation, monitoring and evaluation stages in order to do the following:

- Measure progress;
- Measure effects and impact of the project on both genders;
- Determine whether to adjust programme if necessary.

Possible tools to undertake a gender analysis are listed below

Tool No.	Tool Name
14	The Harvard Framework for Gender Analysis
15	The 24 hour day work analysis

3.2 Component 2: Baseline Data Collection

Baseline data provides a description and information of a current situation. It is done so that activities can be focused, and change can be measured by comparison with similar situations at a future time. Information is identified and collected to describe the present situation as it specifically relates to objectives. For example, if one of the objectives is to reduce the rate of soil erosion, the baseline information required might include:

- what is the present rate of soil erosion?
- what is the present cause(s) of soil erosion?
- what activities by the resource users can accelerate soil erosion?

If the objective was to improve community access to safe drinking water on the other hand, the baseline information might include:

- what is the present water quality?
- what is the present water supply?
- what is the source of the water?
- are there incidents of water related illnesses?
- what is household water consumption?

Baseline information can be acquired using either participatory or non-participatory tools. The choice of tools to be used depend on the nature of the activities and the ability and willingness of the field staff to engage in one or the other of the tools. For instance, if the objective is to improve woody vegetation cover, the current percentage cover is important, and can be established using non-participatory ecological methods. But it can also be done using participatory tools.

Indicators (see box 2 for definition of indicators) should be identified while undertaking baseline assessments. Participatory baselines can complement and enrich non-participatory baselines by allowing the communities to discuss and agree upon what is important to them. It provides field staff with important insights into resources considered useful and/or important by the resource users. An existing forest may not appear in participatory baseline if the community does not use it. A patch of vegetation may not be used for reasons such as harboring a bothersome pest. Thus a participatory baseline may reveal research needs. It also provides learning opportunities for both field staff and the participating community. Baselines can be established through the following simple steps:

- Decide who will be involved in the baseline;
- Decide the issues and indicators for which baseline information will be collected;
- Select quality indicators;
- Establish baseline questions and a baseline team;
- Select tools to use to collect the baseline information;
- Decide when information gathering will be done;
- Decide what to do with the data and information.

Steps 1 and 2 below are important pre-conditions for those projects which wish to carry out local level M&E.

Step 1 Decide who will be involved in the baseline.

The whole community, sample villages, the whole sample village or representative groups within the village. The choice will depend on the size of the community and variability of its interest groups. Possible tools for deciding who will be involved in the baseline are listed in the table below.

Tool No.	Tool Name
2	Participatory stakeholder identification
	Secondary literature search
	Semi-structured interviews
	Group Meetings

Step 2 Decide the issues and indicators for which baseline information will be collected.

The decision can be based on secondary data or by participatory consultations. The issues can be identified using the assessment tools described by Inglis (1997) while the H form (Tool No. 3) can be used for identification of indicators. If participatory tools are used then the purpose and benefits of baseline information should be discussed with the community. Possible tools for deciding the issues and indicators for which baseline information will be collected are listed in the table below.

Tool No.	Tool Name
3	The H-form and community assessment

Step 3 Select quality indicators

Indicators should be relevant and specific to the issue, measurable, timely in delivering information and its measurement should be financially and technically feasible. Possible tools for selecting quality indicators are listed in the table below.

Tool No.	Tool Name
4	Converting reasons to indicators
	Literature search

Step 4 Establish baseline questions and a baseline team.

Whether using participatory or non participatory methods, we must formulate questions that will yield specific information. If the indicators for rangeland improvement is less soil erosion, one of the baseline questions could be, "What is the current rate of erosion?" If the indicator for improved access to safe drinking water for a community is number of households boiling drinking water, the baseline question could be, "How many households currently boil water regularly?" It may be decided that a specialised team is required to collect this baseline information. Such a team will be composed of people with specialised knowledge in data collection using both participatory and non-participatory methods. The teams could comprise two or more members and will have other responsibilities within a project, as monitoring and evaluation should be integrated with other activities of the project. The number and composition of the baseline team will depend on resources available to the project/INGO. Possible tools for establishing baseline questions and a baseline team are listed in the table below.

Tools No.	Tool Name
	semi-structured interviews
	participatory group meetings
	Popular theatre
	Secondary Literature search

Step 5 Select tools to use to collect the baseline information.

Successful implementation of a monitoring and evaluation system depends on the tools used to collect information. The aim is to identify simple practical to use tools that gather as much information as possible. Possible methods for selecting tools to use to collect the baseline information are listed in the table below.

Tools No.	Tool Name
5	Selecting tools
	Secondary Literature search

Step 6 Decide when information gathering will be done.

Gathering monitoring and evaluation information has two important aspects: frequency and timing of data gathering.

- Frequency: A formative approach to monitoring and evaluation is recommended. This means regular evaluations. The exact number depends on the resources available, the nature of the data etc.
- Timing: If aerial photography is required, it has to be done during specific weather conditions. If a range survey is to be done, one has to decide on the merits of doing it during the wet or dry season. If participatory baseline information is to be collected then seasonal constraints, religious holidays, community labour demands (harvesting, planting) and field staff availability have to be considered. Possible tools to use for deciding when information gathering will be done are listed in the table below.

Tools No.	Tool Name
	semi-structured interviews
6	Logical Framework analysis (for work planning)

Step 7 Decide what to do with the data and information.

There are many ways in which baseline data could be analysed, the information stored and presented to the stakeholders. It will make the work easier if these decisions are made before the data is gathered. If a Geographic Information System (GIS) is to be used for instance, then geo-referenced base maps have to be obtained and Global Positioning Systems (GPS) have to be used during resources surveys and community mapping. The Barometer of Well-being and Map Maker GIS are described as tools for analysing, storing and communicating baseline and monitoring information. Possible tools for deciding what to do with the data and information are listed in the table below.

Tools No.	Tool Name
	Participatory group Meeting
	Secondary Literature search

3.3 Component 3: Monitoring

Monitoring is the systematic measuring, recording and periodic analysis of data on performance of previously selected indicators, e.g. rates of soil erosion, rate of growth of trees/crops, kilograms of maize per hectare, number of incidents of diarrhoea. Monitoring provides information during the life span of a project. The time to measure and analyse data depends on the nature of the activity and resources available. For range condition measurement may be twice a year, while for incidents of illnesses recording is on-going and analysis may be once a week, a month or, a year depending on the life span of the project.

Regular measurements and recording provides an on-going picture that allows the project staff and the community to determine whether activities are progressing as planned and whether activities are leading to objectives. It therefore provides an "early warning" and allows identification of problems at an early stage. It also ensures that quality of the activities is sufficient to provide good results. For example amount of soil passing through gabions can indicate whether the gabion is effective in its early days. Similarly, seedling survival surveys in the first few months after seedlings are outplanted can indicate whether the quality of nursery stock and/or planting and stock handling are good. Information gathered can show trends, e.g. trends in natural resources and disease incidents.

Whether participatory or non-participatory measurements (monitoring) are undertaken, it is important to understand why monitoring is being carried out. It is important for field technicians taking measurements, of say range condition, to understand the importance of the data they collect and therefore the need to be careful and as accurate as possible. It is equally important for farmers to understand the need for the monitoring data if they have to record say, debes or kilograms of maize per hectare. Monitoring can be carried out using the following simple steps:

- review reasons for monitoring;
- develop monitoring questions;
- establish indicators;
- decide which information gathering tools will be used;
- decide who will take measurements and keep records;
- analyse and present results.

Step 1 Review reasons for monitoring.

It is important that all parties involved in the regular measurement and recording of information understand the importance of the activity and the need to keep the records accurately and safely. This can be achieved through a review of the objectives and activities. Possible tools for reviewing reasons for monitoring are listed in the table below.

Tools No.	Tool Name
	Popular Theatre
	Group meetings
	Secondary Literature search

Step 2 Develop monitoring questions

What do we want to know and what information do we collect to know it. These questions will be unique to the process or activity being monitored. Possible tools for developing monitoring questions are listed in the table below.

Tools No.	Tool Name
	Popular Theatre
	Group meetings
	Secondary Literature search

Step 3 Establish indicators

Indicators could be quantitative or qualitative, direct or indirect (see box 2 for definitions). This exercise may be combined with establishing indicators for evaluation (section 3.4 below). Possible tools for establishing indicators are listed in the table below.

Tools No.	Tool Name
3	H-Form for community assessment
	Secondary literature search

Step 4. Decide which information gathering tools will be used

You must choose the most appropriate tool for each monitoring question or indicator. Tools selected should be simple, practical to use and gather as much information as possible. The most appropriate tool will depend on the resources (financial, technical and human) available, and one tool may gather information on several indicators at once.

The following table shows application of the tool for selecting possible participatory and non-participatory tools in Haraf village.

Issue	Indicators	Participatory tools	Non-participatory tools
Potable water	Number of wells with cover slab	mapping, transects	inventory, water quality tests, observations
	Incidents of water borne diseases	mapping, transect walks	inventory, water quality tests, observations
	No. of fully functional wells	social and health mapping, body mapping, semi-structured interviews, trend diagrams	hospital records, drug sales records
	Distance from village to permanent water points	mapping, seasonal calendars, transect walks.	inventory, questionnaire survey
	No. of earth/cement water reservoirs in the village	mapping, transect walk	inventory, records
	Number of permanent well in the village	mapping, transect	observation, records, inventory
	Quality of water from earth/cement reservoirs	semi-structured interviews, social mapping	Water quality tests.

Possible methods for deciding which information gathering tools will be used are listed in the table below.

Tool No.	Tool Name
5	Selecting tools

Step 5 Decide who will take measurements and keep records

Regular measurements and record keeping is an activity that requires resources. It involves use of time and probably some skilled labour. Unless this is planned for, measurements and records may not be kept or not kept regularly. This is especially important if participatory monitoring is being done, as measurements and recording have to compete for time with other community/family labour requirements. Possible tools for deciding who will take measurements and keep records are listed in the table below.

Tools No.	Tool Name
	Semi-structured interviews
	Group meetings

Step 6 Analyse and present results

Unless monitoring information is analysed and presented to the interested parties, it remains just figures. Possible tools for analysing and presenting results are listed in the table below.

Tools No.	Tool Name
9	Map Maker GIS
7	PRAM
8	Barometer of Well-being, ratings
	Drawing and discussion
	Ranking, rating and sorting
	Murals and posters

3.4 Component 4: Evaluation

Evaluation is the action of reflecting on the past data gathered during monitoring in order to make decisions about the future. It is time to reflect and ask "Was the time and money invested in the activities worthwhile?"; "Should we continue doing what we are doing?"; "What needs to change in the way we have conducted the project activities?". This reflection is the link between monitoring and evaluation. Without it data gathered for monitoring remains just data. An evaluation questions the objectives, their continued relevance and effectiveness of the activities to achieve the objectives. During an evaluation we learn:

- what worked well and why;
- what did not work well and why;
- identify corrective measures.

Evaluations can be done using both participatory and non-participatory methods. A participatory evaluation continues the process of community involvement in project activities. Indeed, evaluations are not new to communities. When a community stops support to project activities or discontinue the activities after field staff are withdrawn, they have done an evaluation themselves, albeit without formerly collected baseline and monitoring data. Project staff should help the communities to collect data on which to base their own evaluations. An evaluation can be undertaken using the following simple steps:

- preparation for an evaluation;
- review objectives and activities;
- review reasons for evaluation;
- develop evaluation questions;
- analyse and present results

Step 1 Preparation for an evaluation

This may involve identifying a team of experts in both participatory and/or non-participatory evaluations. Once again we ask "What resources are required"; "What resources do we have?"; "What resources must we get to carry out our evaluation?". For participatory evaluations, group meetings must be scheduled to minimise conflict on time and labour demands. We must check the seasonal calendar, religious and public holidays, and availability of field staff to select a date. For non-participatory evaluation by outsiders, logistics must be organised. Preparation for an evaluation includes reviewing the indicators identified during the baseline data collection and the monitoring data collected. The monitoring data has to be prepared and availed to the evaluators. Review who has been collecting what data and where has the data been stored.

Step 2 Review objectives and activities

Whether done by outsiders or through a participatory process, the evaluation should start with a review of the objectives, explaining how activities are foreseen to achieve the objectives. The evaluators will use the monitoring information to judge:

- whether the activities will indeed achieve the objectives;
- whether achievement of the objectives will address problem(s) intended
- whether addressing the problem(s) in itself is good for the people and their environment.

Possible tools for reviewing objectives and activities are listed in the table below.

Tools No.	Tool Name
	Popular Theatre
	Group meetings
	Murals and posters, flannel boards
	Secondary Literature search

Step 3 Review reasons for evaluation

"Why are we doing an evaluation?; "What do we need to know?" "What data will tell us what we need to know?". Possible tools for reviewing reasons for evaluation are listed in the table below.

Tools No.	Tool Name
	Popular Theatre
	Group meetings
	Murals and posters, flannel boards
	Secondary Literature search

Step 4 Develop evaluation questions

These questions will be derived from project goal, objectives, purposes and activities, as well as from the monitoring indicators. For example, a project whose goal is to conserve a forest through planting fast growing trees and improved use of wood and charcoal, may have as indicators number of households appropriately using improved firestoves, number of well established woodlots and hectares of reforested land. The evaluation questions might be:

- how many families are appropriately using improved firestoves?
- how many well developed woodlots in the village?
- how many acres have been reforested?
- has the introduction and use of improved firestoves led to less fuelwood consumption?
- has the establishment of woodlots led to less fuelwood consumption?
- has reduced fuelwood consumption led to reforestation?
- is it possible that reduced fuelwood consumption has led to worsening of peoples well-being? In theory it could be that people stop harvesting fuelwood from the natural forest and the woodlot because the natural forest is out of bounds and the woodlots consists of species considered inferior as fuelwood. The net result is that a woodlot flourishes, the natural forest regenerates, but the people use less fuel, cook less and eat less. Their well-being deteriorates while that of the environment improves.

Possible tools for developing evaluation questions are listed in the table below.

Tool No.	Tool name
	Group meetings
	Popular theatre
	literature review

3.5 Component 5: Data Analysis

Analysis is examining the information in order to understand the "parts" from the "whole". It may include sorting out, adding things up, comparing, mapping, among others. Data analysis and presentation of results can be done using the following simple steps:

- review evaluation questions;
- organise the information and decide how to analyse it;
- integrate the information;
- presenting results

Step 1 Review evaluation questions.

It is important for evaluators to remind themselves what the evaluation is meant to achieve, what information each evaluation question was meant to raise and why it was necessary to do so. Reviewing evaluation questions matches information obtained from the evaluation to evaluation questions, highlighting important information that may be unrelated to the questions. This will provide the basis for revision of objectives or project design. Possible tools for reviewing evaluation questions are listed in the table below.

Tools No.	Tool Name
	Popular Theatre
	Group meetings
	Murals and posters, flannel boards
	Secondary Literature search

Step 2 Organise the information and decide how to analyse it.

How the information is analysed will depend on the nature of information and resources available. Some projects have computer packages for data analysis, others have GIS facilities for advanced analysis and mapping while others have none of these. Care should be taken to analyse both quantitative and qualitative data. Possible tools for Organising information and deciding how to analyse it are listed in the table below.

Tool No.	Tool name
7	PRAM
9	Map Maker GIS
8	Barometer of well-being
	Ranking, rating and sorting

Step 3

Integrate the information.

This is putting all the pieces of analysed information together to tell a complete story on whether improvement in one system has led to an improvement in the other. Has improvement in rangelands, conservation of forests etc., led to improved livelihoods and peoples well-being? Possible tools for integrating the information are listed in the table below.

Tool No.	Tool name
7	PRAM
9	Map Maker GIS
8	Barometer of Well-Being
	Ranking, rating and sorting

Presenting results

The process of data analysis is incomplete until data is delivered to the relevant audience and decisions made. Often good results are not used because the presentation is not user friendly. If results are not used to guide decisions the resources invested in evaluation, data gathering and analysis are wasted, and the link through which monitoring guides decision making is made ineffective. It is important, therefore, that relevant information be presented to decision makers on time, and be presented in a way that is easy to understand. Results can be presented in written, oral or visual ways. Possible ways of presenting results are listed in the table below.

Written	Oral	Visual
Reports	Drama	Photographs
Case studies	Tape recordings	Maps
Community newsletter	Story telling	Illustrations
Graphics		Drawings
		Video, slides
		Graphics

4.0 Requirements for implementing the system

4.1 Personnel

There is need for projects implementing the system to have a project staff member responsible for monitoring and evaluation. Even though this person may undertake other duties, ideally s/he should dedicate a substantial amount of their time to M&E. The danger of dedicating one person to M&E without other duties is that it may lead to isolation of the activity and reduce chances of integrating it to all project activities. The person in charge of M&E should have training and experience in participatory methodologies in addition to disciplines related to the requirements for the project's main activities. For example, for a soil and water conservation project, the person in charge of M&E will be trained in soil conservation, soil engineering or ecology, and have participatory skills. This means that projects wishing to implement the system and not wishing to recruit more staff, can use their core staff, but give them additional training in participatory processes facilitation skills.

4.2 Resources

For the M&E system proposed here to be effectively implemented, it is important to have a supporting budget to purchase Map Maker software, training in participatory processes, computer operations and basic cartography. Other resources required will be a computer and Map Maker soft ware. The requirements for Map Maker training is explained in the sections above.

5.0 Challenges to the system

The system proposed has the following weaknesses:

- By involving communities, it will be slow to implement. If a project area has say ten villages, conducting indicator workshops in all ten villages will be slow and expensive. This can be seen as is a serious constraint by project staff operating within short funding cycles. However, sampling techniques can reduce the number of workshops necessary. It is rare that a project would work with all villages within its area, and such workshops should be restricted to the villages actual work is taking place;

- By restricting the M&E system to projects funded under the EU Rehabilitation Programme, it cannot be implemented through out the country, especially in the South where security is still a problem and the EU is currently not funding projects;

- Most projects in Somalia have a very high staff turn over. This is bound to affect implementation of the M&E as it affects implementation of the overall project;

- Most of Somali people are pastoralists, and it has been argued that participatory methods do not work well with pastoral groups.

Annex 1: Terms of Reference for elaborating a local level monitoring and evaluation system for the natural resources of Somalia

INTRODUCTION:

As part of the EC Rehabilitation Programme for Somalia, IUCN is undertaking a natural resources management Programme to assist the EC develop adequate and flexible strategies and methodologies for the conservation and sustainable use of the natural resources in Somalia. The first phase objectives of the Programme are:

§ to establish a basis for the conservation of Somalia's natural resource assets from further deterioration

§ to promote and consolidate the links between natural resource management and conservation, and the improvement in the welfare of the local communities of Somalia

§ to provide guidance and advice to the EC Rehabilitation Programme for Somalia on natural resources and environmental matters

The initial first phase, characterised as a strategic planning period, aims to address all the necessary programmatic and operational preparatory work to establish a sound basis for the implementation of field-based natural resource management activities *per se* or activities in support of, or benefiting from, other sectors of the EC Rehabilitation Programme for Somalia.

With the EC Rehabilitation Programme based significantly on resource utilisation in one way or another and evidence of land and marine degradation in Somalia, it is important that information and data on resource status and use is obtained, and subsequently used for monitoring the impact of interventions on the environment and social well-being of the Somali population.

Currently, international institutions and emerging local institutions are embarking on rehabilitation and development activities in areas where relative political stability and security are improving. The emphasis of these interventions is local level participation in identifying, planning and management of interventions. The institutions are therefore working in close consultation with traditional decision making and management systems (e.g. council of elders and village committees). To ensure sustainable and wise use of natural resources within this context, a monitoring and evaluation (M&E) system that allows a better understanding of the dynamics, and whose results are used to strengthen policy, planning and implementation processes is essential.

Several elements of monitoring are foreseen, thus:

- Monitoring trends in natural resources in order to gain a better understanding of the environment;
- Monitoring the effect of interventions on the biophysical system (e.g. the status of the natural resources such as quality and abundance, biodiversity, range condition, regeneration of renewable natural resources);
- Monitoring the effects of interventions on the socio-economic system e.g. human well-being such as quality of life, economic factors such as access to goods and issues of equity.

The IUCN Natural Resources Programme is also exploring possibility for a remote sensing/GIS based macro level monitoring and evaluation system. The proposed system will provide macro level monitoring and evaluation of trends in the natural resources using satellite and aerial photo data and GIS applications. However, to complement the participatory approach to planning and management of development interventions, local level monitoring involving both conventional and participatory approaches is also necessary. Participatory approaches are important in involving local people in M&E to ensure relevance of indicators and to convey local ownership of interventions, thereby empowering local communities. Data collected by participatory approaches however, requires validation by data collected through conventional approaches. The challenge is to identify an approach that involves stake holders as participants in the process, (given that the stakeholders may have different objectives and views, which may even conflict) and elaborate a system that evaluates both the biophysical (ecosystem) and socio-economic (human) systems. Such a system should therefore be a combination of conventional and participatory monitoring and evaluation methods.

Key to the elaboration of the system is identification of stakeholders, appropriate indicative issues to be monitored and appropriate indicators to measure change in the indicative issues identified. Each production system (rangelands and pastoralism, agriculture, forestry etc.) may have different indicative issues and different stakeholders. The works of Inglis, 1997, (Innovative Participatory Methodologies For Environmental Interventions At The Community Level) and Jackson, 1997, (The Tools And Methods For Monitoring And Evaluating Collaborative

Management Of Natural Resources In Eastern Africa) provide a sound basis for identifying participatory approaches, stakeholders, production systems, indicative issues and indicators.

To be effective, the monitoring and evaluation system will require a data storage and manipulation system, that harmonises the qualitative participatory information and the quantitative conventional monitoring data. Appropriate data analysis is necessary to process the data and to ensure that the results of the monitoring and evaluation feed back into, and strengthen the policy, planning and implementation processes. Map Maker GIS has been identified by several organisations involved with rehabilitation work in Somali e.g. UNDOS and UNOPS and the IUCN monitoring and evaluation consultant, as a possible tool to harmonise the data. However other simple data storage and analysis tools need to be explored. In addition, ways to link the remote sensing/GIS based macro level M&E system to the local (local) level M&E system must be sought.

OBJECTIVES

The overall aim of the consultancy is to elaborate and design a local level monitoring and evaluation system that assesses the status of the natural resources, the impact of development interventions on the status of the natural resources and the socio-economic systems of Somalia, using both conventional and participatory approaches and tools.

In support of the overall aim, the following objectives will be attained:

- A local level conventional monitoring and evaluation system that assesses the status of natural resources and the effects of the interventions on them elaborated;
- A local level participatory monitoring and evaluation system that involves stakeholders in assessing the status of natural resources and the effects of the interventions on natural resources and social systems elaborated;
- A data storage and analysis system that harmonises the quantitative conventional monitoring data and the qualitative participatory monitoring data identified and tested;
- A mechanism through which results of the M&E feed back into and strengthen the policy formulation, planning and management processes elaborated;
- Linkages and/or potential linkages with macro level M&E system explored;
- A local level M&E system elaborated, and requirements for implementation (personnel, training) assessed.

TASKS

Building on the "Innovative Participatory Methodologies For Environmental Interventions at the Community Level" (Inglis, 1997) and "The Tools And Methods for Monitoring and Evaluating Collaborative Management of Natural Resources in Eastern Africa" (Jackson, 1997), the team will:

- Design a process for identifying indicative issues to be monitored in the various production systems;
- Design a process for identifying indicators of change in both the biophysical and socio-economic systems, for the indicative issues identified from the above process;
- Design a process for identifying stake holders for a given system;
- Identify appropriate participatory approaches, tools, and methods for measuring changes in the selected indicators identified;
- Test the feasibility (technical, finance/cost, equipment, skills, human resources) of the data storage and analysis system recommended;
- Test the applicability of both the monitoring and evaluation system elaborated and the data storage and analysis system recommended as a tool for harmonising the qualitative and quantitative data in a case study;
- Formulate a mechanism through which results of M&E are fed back into the policy formulation, planning and management processes;
- Consult with the macro M&E facilitator to explore ways to link the macro and local monitoring systems.

OUTPUTS

The main output of the consultancy will be a report with the following sections, among others:

- Executive summary and introduction.
- Methods and approaches of activity (consultancy process)
- Concise descriptions of practical field and office guide on monitoring and evaluation of specific production

systems including objectives of monitoring, issues (indicative issues) for monitoring, process for choosing indicators for the indicative issues, biophysical indicators, social indicators, methods and approaches of measuring changes in the indicators, and guideline on interpretation of the changes in indicators for the various production systems.

- Recommendations on the Map Maker GIS as a tool to harmonise qualitative and quantitative data.
- A mechanism of M&E feed back into the processes of intervention.
- Results of a case study
- Conclusion
- Annexes.

STAFFING

Since the Andrew Inglis (IUCN, 1997) report is detailed in participatory methodologies and the Bill Jackson (Jackson, 1997) report is detailed in criteria for establishing systems, indicative issues and indicators, the activity will be carried out by a team of two professionals having relevant experience and expertise in natural resources monitoring and rural and social development, in particular participatory planning and monitoring methods. Ms. Veronica Muthui, Somali Natural Resources Programme Officer will be joined by a community facilitation consultant with a professional background in natural resources to carry out the work.

Annex 2: ITINERARY

Date	Activity
Friday, 20th June to Friday, July 4th	Literature search in Nairobi (Muthui) and UK (Inglis).
Sunday, 6th July	Andrew Inglis arrived Nairobi.
Monday and Tuesday, 7th and 8th July.	Draft monitoring and evaluation system in Nairobi and prepare for field testing in Somalia.
Wednesday, 9th July	Travel to "Somaliland", meet Chris Print, Swiss group in Hargeisa District.
Thursday, 10th July.	Travel to Boroma. Meet with Osman of the Swiss group, Sofia Jibril Younis and Mohammed Nur Sultan. Prepare for a trial test of system in Hayayabo village, Boroma District.
Friday, 11th July	Testing some participatory tools in Hayayabo village.
Saturday, 12th July	Data analysis and discussions of trial. Modification of questions to II form.
Sunday, 13th July.	Travel to Hargeisa, discussions with Swiss group and Islamic Relief Committee. Preparation for testing of modified tools in Haraf village, Hargeisa District. Team dispatched to prepare village for meeting the following day.
Monday, 14th July.	Testing of modified tools in Haraf village.
Tuesday, 15th July.	Data translation, analysis and report writing (Somali version of report of the village meeting), debriefing with Swissgroup and Islamic Relief Committee.
Wednesday,, 16th July.	Travel back to Nairobi
Thursday, 17th July	Muthui and Inglis debriefing with Christina Amaral, EC Somalia Unit.
18th July - 6th November	Preparation of draft report
Thursday, 6th November.	Presentation of draft system at IUCN Somalia Workshop on "Programme's Outputs" Silver Springs Hotel, Nairobi.
November - December 1997	Finalisation of report.

Annex 3: References

Derek Poate, 1993. More "M" and less "E". In The Rural Extension Bulletin Number 1. University of Reading Agricultural Extension and Rural Development Department, April 1993.

Duddley, Eric, 1997. Teach yourself Map Maker. Basics. Draft Edition, March 1997. Map Maker. UK.

Imbach, Alenjandro and Dudley, Eric, 1997. Questions of survival. A questioning approach to understanding sustainable and equitable development. IUCN, An Approach to Assessing Progress Towards Sustainability, Tools and Training Series. IUCN, Gland, Switzerland.

FAO, 1990. Community Forestry Manual 2. The Community's Tool Box. FAO, Rome, 1990.

Inglis, Andrew, 1997. Innovative participatory methodologies for environmental interventions at the community level. Somali Natural Resources Management Programme, IUCN- The World Conservation Union, East African Regional Office, Nairobi.

IUCN, 1997. An Approach to Assessing Progress Towards Sustainability, Tools and Training Series. IUCN, Gland, Switzerland.

IUCN, 1997. Summary of activities and approaches to monitoring and evaluation in East and South Africa: 1996-1997. Pilot Regions for IUCN M&E Initiative. IUCN, Gland.

Jackson, William, 1997. Designing Projects And Project Evaluation Using The Logical Framework Approach. Unpublished.

Jackson, William, 1997. Facilitating Participatory Planning Workshops. Unpublished.

Jackson, William and Denise Bond, 1997. Monitoring and Evaluating Collaborative Management of Natural Resources In Eastern Africa. Proceedings of a workshop held in Tanga, Tanzania - April 7th to 11th, 1997. IUCN East African Regional Office, Nairobi.

Lusigi, Walter, 1986. Management plan for West Marsabit District. IPAL Technical Report No. 6. UNESCO, Nairobi.

Murphy, Joseph, 1993. Good enough, soon enough. A user oriented approach to monitoring and evaluation in extension agencies: In The Rural Extension Bulletin Number 1. University of Reading Agricultural Extension and Rural Development Department, April 1993.

Prescott-Allen, Robert, 1997. Barometer of Sustainability. Measuring and communicating well-being and sustainable development. IUCN - An Approach to Assessing Progress Towards Sustainability, Tools and Training Series. IUCN, Gland, Switzerland.

RMR - Resource Management and Research, 1989. Somali Democratic Republic Northern Rangelands Survey. Volume 1, Part 1 and 2. RMR, London.

Shields, Dermot, 1993. What is the Logical Framework. A step-by-step users guide. In The Rural Extension Bulletin Number 1. University of Reading Agricultural Extension and Rural Development Department, April 1993.

Smith, Diana-Lee, 1997. Community Based Indicators. Draft booklet prepared for IUCN/IDRC Project on Monitoring and Assessing Progress Towards Sustainability. IUCN, Gland.

Annex 4: Description of the tools recommended for use with the system

Tool 1: Mapping Resources and identifying Priority issues

A simple open process through which local people map their resources and determine what local priorities is described below. The process is achieved by bringing the community together in a three stage meeting. The process starts with a general meeting to introduce the objectives of the meeting and tools to be used. After brief introductions the meeting is split into two groups. One group draws a social map while the other draws a resource map. The groups then come together to raise priority issues. This process does not narrowly pre-define what constitutes the local 'environment' (i.e. does not restrict it to natural resources such as trees, rivers, sea, fish, water sources, wildlife) and the priorities which emerge are as unbiased by the facilitators as possible. This inevitably means that non-natural resource problems as well as natural resource problems will probably emerge from the process, but the resulting interventions will stand a better chance of solving local priority problems and achieving sustainable environmental management. It is a visual process and the outcomes can be easily shared and verified.

Drawing participatory social and seasonal resource maps

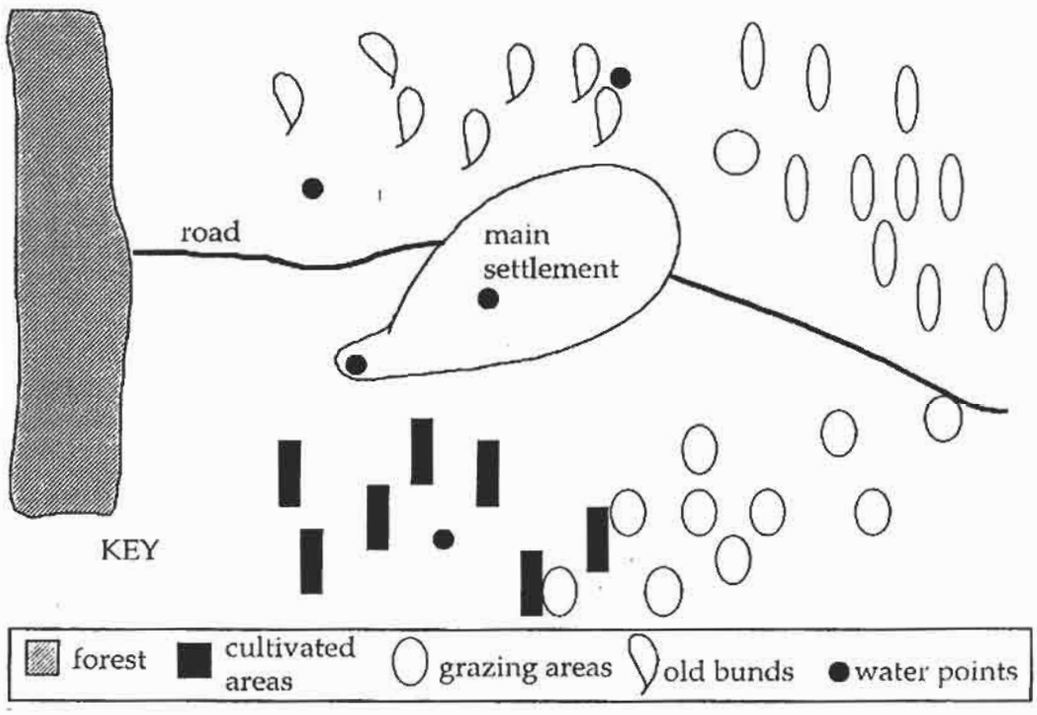
Such maps have the following purposes:

- To get an indication of social amenities and infrastructure available in the area;
- To get an indication of the extent of the local area which is used and/or managed by local people;
- To get an indication of the variety, quantity and location of natural resources in the area;
- To illustrate different uses, users and problems at different times of the year for the same areas of land or natural resources;
- To obtain indicative base maps for the later stages of the process;
- To make the process a visual one so that the outcomes can be easily shared and verified.

Procedure for drawing participatory resource/social maps

Split the meeting into two groups. Ask one group (or if there are enough facilitators, groups) of local people to draw a map on large paper with marker pens, of all the natural resources in the area which local people use (see example on graphic below).

Note: It can sometimes be better to start by asking people to draw the map with a stick in the sand to begin with, so boundaries/scale can be established, and confidence built if required, before asking them to put pen to large paper.



Ask the group to make another resources map for each season, or (as has been the case in the testing so far), one map for the 2 wet seasons and one map for the 2 dry seasons. Ask the other group to draw a map and show all the

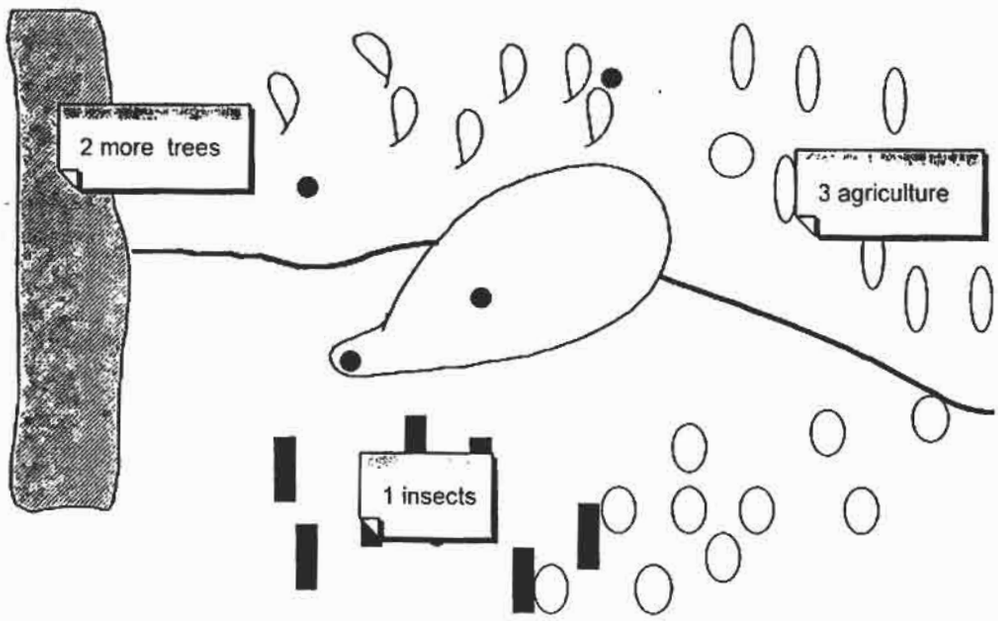
ıocial facilities in the area such as roads, schools, local centres and hospitals. Ask each of the groups to generate ıriority changes using priority sticky notes as described below.

Priority change sticky notes

Objectives:

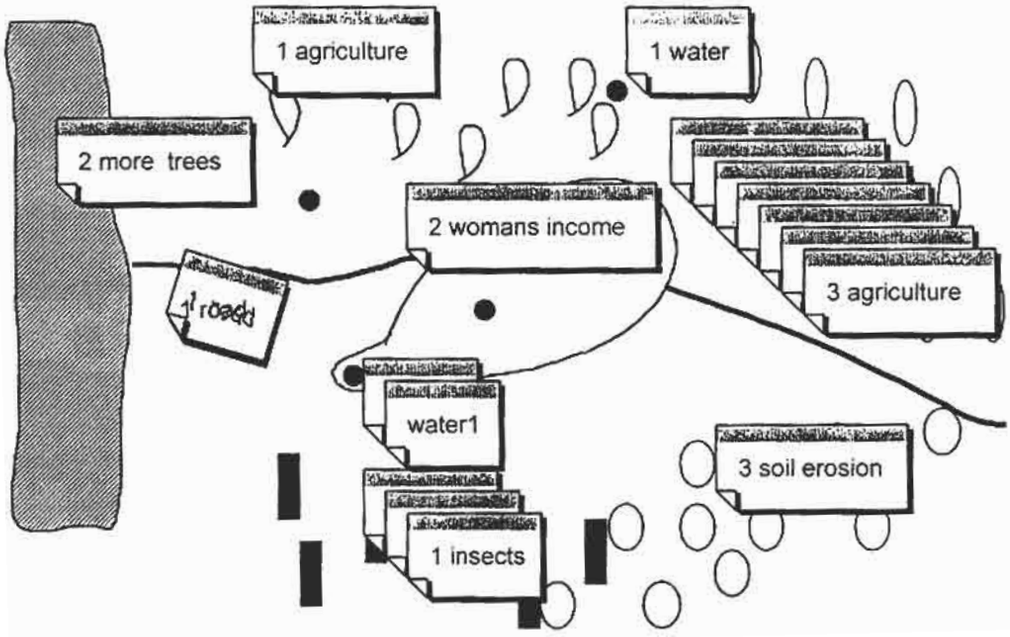
- To get an idea of what the local priority issues are;
- To begin the process of spatially fixing with local agreement where priority environmental interventions could take place;
- To reduce the risk of only a few individuals dominating the determination of local priority issues;
- To enable women to separately indicate their preferred issues so that they can be differentiated from the men's at the next stage of the process;
- To obtain quantifiable baseline information for later parts of the process;
- To make the process a visual one so that the outcomes can be easily shared and verified.

Give each person in the mapping group(s) three sticky notes on which to write or draw (with a marker pen) the changes they would like to see to their local environment, prioritise them 1, 2 & 3 ('1' highest) and stick them on to the map as shown in the diagrams.



Note: If more than one resources map has been made (one for wet seasons, one for dry seasons, or if separate men's and women's resource mapping groups were possible) one of the maps should be used exclusively for the stickies of men, the other map only for women.

Remind people that they should write or draw one change per sticky with an indication of the order of priority and to put the sticky notes in the location roughly where they want each change to happen (see example below).



When everybody in the group has put down their three numbered changes, make all the stickies secure on the map, as soon as possible if it is windy (small pieces of sellotape are best). If there is a time gap that enables a chance to count or ask local people to count and note what is written on the stickies, make a table showing the priorities of men and women and the number of times the same change was written on the sticky notes (see example matrix below):

Priority	Men's Changes	Women's Changes
1	Agriculture x 16	Agriculture x 3
	Water x 2	Bunds x 1
2	Water x 4	Water x 3
	Bunds x 1	
	Agriculture x 1	
3	Human health x 4	Animal health x 1
	Animal health x 4	Human health x 1
	Control bush grazing x 1	Education x 1

Note: If there is not enough time to count and display the scores, display the maps with the stickies on close to the matrix used at the next stage and use them as rough and ready visual guides to what local people's priority issues are.

Identification of local Priority issues

Bring the groups together to identify priority issues. Each group should chose a representative to present the group map to the others. By the end of the priority issue identification session the groups should:

- link each priority issue with the local groups or individuals who are taking decisions in these specific areas or about that specific aspect of local environmental management;
- initiate and complete a priority issue matrix and spatially fix all the local priority environmental changes;
- provide delivery agencies with guidelines as to locations and ideas regarding modus operandi of and partnerships with local institutions for future interventions;
- make the process a visual one so that the outcomes can be easily shared and verified;
- start the process of generating M&E indicators and baseline information.

Procedure for priority issue identification

After explaining and discussing each others maps, desired changes and the institution matrix, both groups work together with a meeting facilitator to fill in a priority change matrix (see next page), the headings of which are pre-prepared by the facilitation team:

PRIORITY CHANGE	WHY	HOW	WHERE (map 1)	WHO IS RESPONSIBLE
1.				

Note:

Leave space for another column at the right of the paper, but do not draw it in at this stage. This will be for recording, at a later stage of the meeting, the group ratings of the present situation and the final agreed score.

Ask the people at the meeting which change they would like to see happen first. Fill in the matrix as instructed by the people at the meeting, giving sufficient time for discussion and agreement (and voting if necessary) at each stage. For the "Where" column, always ask for the exact, specific location for the change and mark it on the matrix and on the map with a different letter code, starting with "Aa" (see the example matrix below and map on following page from the testing of tools in Haraf village, Hargeisa District, "Somaliland".

If there are several locations for one change ask the people at the meeting where it should happen first (Aa), second (Ab), third (Ac), etc. (see example on map). For each specified location, the rest of the columns to the right should be completed and underlined before going on to the next location. When all the locations for the one change have been identified, draw a full horizontal line across the matrix and go on to the next step. For the "Who is responsible" column use the number or symbol of the group(s) identified in the local decision makers table

After completing a horizontal line, ask the people at the meeting what change they would want to see happen next, and then follow the same process.

After drawing a line under each change, continue to ask the people at the meeting what the next change is they would like to see, until those at the meeting declare that they have covered all their priority changes.

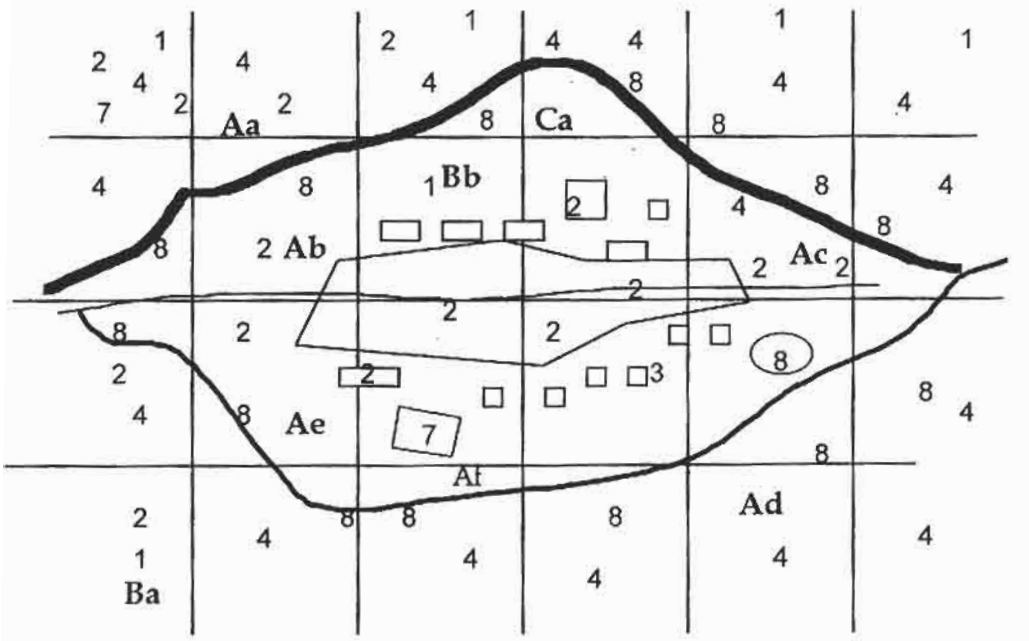
Read through the matrix with the people at the meeting, making reference to all the specified locations on the map to check if there are any mistakes and/or disputed or unclear points.

Priority Change Matrix from Haraf Village, Hargeisa District, "Somaliland"

PRIORITY CHANGE	WHY	HOW	WHERE (map I)	WHO IS RESPONSIBLE
I. Agriculture	Water wells destroyed.	Construct wells with concrete reams.	Aa Ab Ac	1, 2 & 3 on the group matrix 1,2,4 1,2, 3
	Water level goes down in winter.	Construct water catchment.	Ad Ae	1,2 1,2
	Canals are cut by run-off	Canalisation-.	Af	1,2,6
	Cultivated areas are destroyed by floods.	Control of gully erosion.	Ag Ah Ai	1,2,3,7 1,2,3,7 1,2,3,7,8
2. Livestock	Health problem.	Regular medical supply. Provision of veterinary institution.	Ba	1,2,& 3 1,2,3,4
	Shortage of range area.	Erosion control.	Bb	1,2,4,5.
3. Poultry	It is useful	Provision of medical treatment drugs. To provide enough and regular food.	Ca	1,3
		To provide adequate rearing environments.	Cb Cc Cd Ce Cf	3 3 3 3 3
4. Human health	Various diseases affect the people of the community	Extension of the former health centre. Regular medical supplies. Provision of training.	D	3
5.Education	Illiteracy exists.	Construction or extension of former school.	E	1 & 2
6. Water	Shortage of potable water.	Construction or digging of cemented wells with cover slabs.	Fa Fb Fc Fd	4
		Construction of berkeds.	F e Ff	4

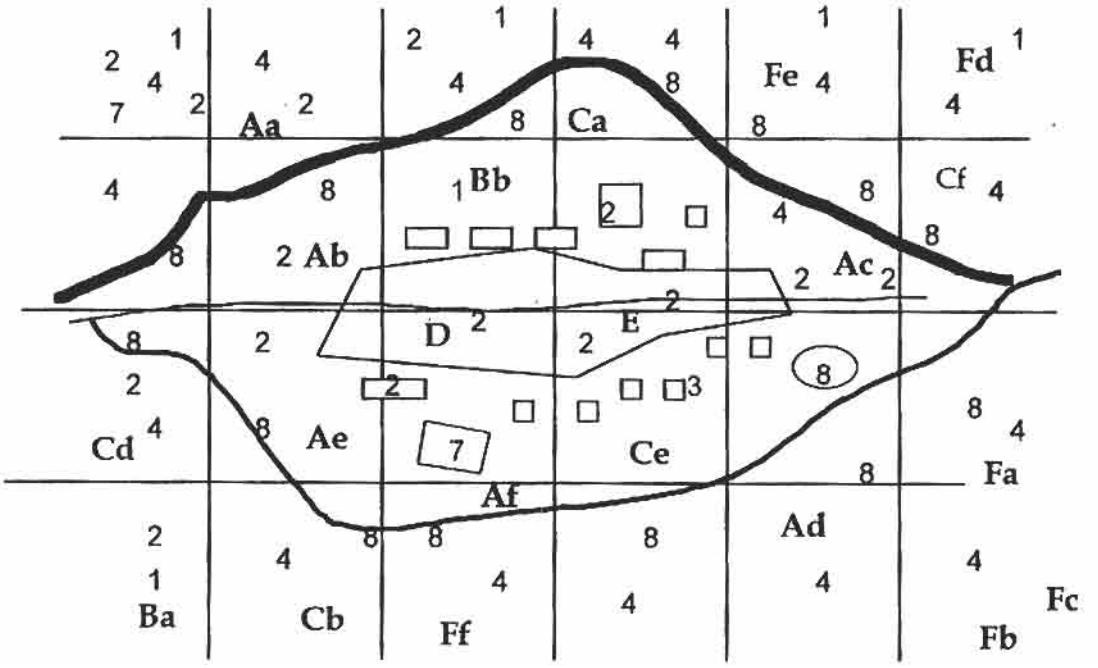
Map showing areas selected for interventions, Haraf village, Hargeisa District, "Somaliland"

This map showing areas selected for interventions was generated during the testing of some of the tools recommended for implementing the proposed M&E system. The testing was done in Haraf village, Hargeisa District in mid-July, 1997.



Map Showing double markings (Aa, Bb etc.) for areas selected for interventions, Haraf, Hargeisa District ""Somaliland""

This map showing areas selected for interventions was generated during the testing of some of the tools recommended for implementing the proposed M&E system. The testing was done in Haraf village, Hargeisa in Mid-July, 1997.



TOOL 2: PARTICIPATORY IDENTIFICATION OF STAKEHOLDERS.

A stakeholder is any individual, social group or institution who possess a direct, significant and specific stake or interest in the area concerned. The stake or interest can arise from institutional mandate, dependence for livelihood, geographical proximity, historic association, economic interests and many other reasons.

For M&E to be effective stake holders should be involved at the beginning of the process, in order to develop commitment to, and ownership of the projects and to the monitoring and evaluation process. In support of stakeholder involvement in M&E, Lee-Smith (1996) argues that placing indicators in the control of communities gives them the potential to control their own lives and resources. If they have identified what needs measurement based on their own analysis, they have ownership over the process and will use assessment effectively. Lee-Smith goes on to say that developing data systemizes knowledge, helping communities learn about their resources, empowering them to control the process of change. But stakeholders have to be identified before you can get them to identify indicators. The tool described in this section assists in a participatory identification of stakeholders and cross-referencingthe stakeholders to resources they would be responsible for.

Identifying Local stakeholders and cross-referencing stakeholders to mapped resources

This is a two stage participatory process. In stage, meeting participants generate decision making entities and cross reference them to resources in stage 2, in a process described below.

In a group meeting, split people in small groups of maximum 6 people in a group. Ask each group of local people to make a list of all the local decision making groups/committees/institutions/influentialindividuals in the middle of a plain piece of large paper, before adding other columns or column headings (see example below).

Make a column, to the right of the list of groups, and title it "responsibilities". Then, taking each named group in turn, ask the group of local people which aspects of local life the group is involved with and what responsibilities and decision making authority they have.

name	responsibilities
council of elders	general order
agriculture committee	marketing
etc.	etc.
etc.	etc.

Make another column, to the right of the list of responsibilities, and title it "number involved". Then, taking each named group in turn, ask how many people are in the group/local institution and write the number.

Name	responsibilities	no. involved
council of elders	general order	9
agriculture committee	marketing	6
etc.	etc.	etc.
etc.	etc.	etc.

Make a fourth column, this time to the <u>left</u> of the list of group names, and title it "reference number/symbol". Then, starting at the top, number the groups 1, 2, 3 etc., or ask local people to suggest symbols to represent the groups.

reference number/symbol	name	responsibilities	no. involved
1	council of elders	general order	9
2	agriculture committee	marketing	6
*	etc.	etc.	etc.
4	etc.	etc.	etc.

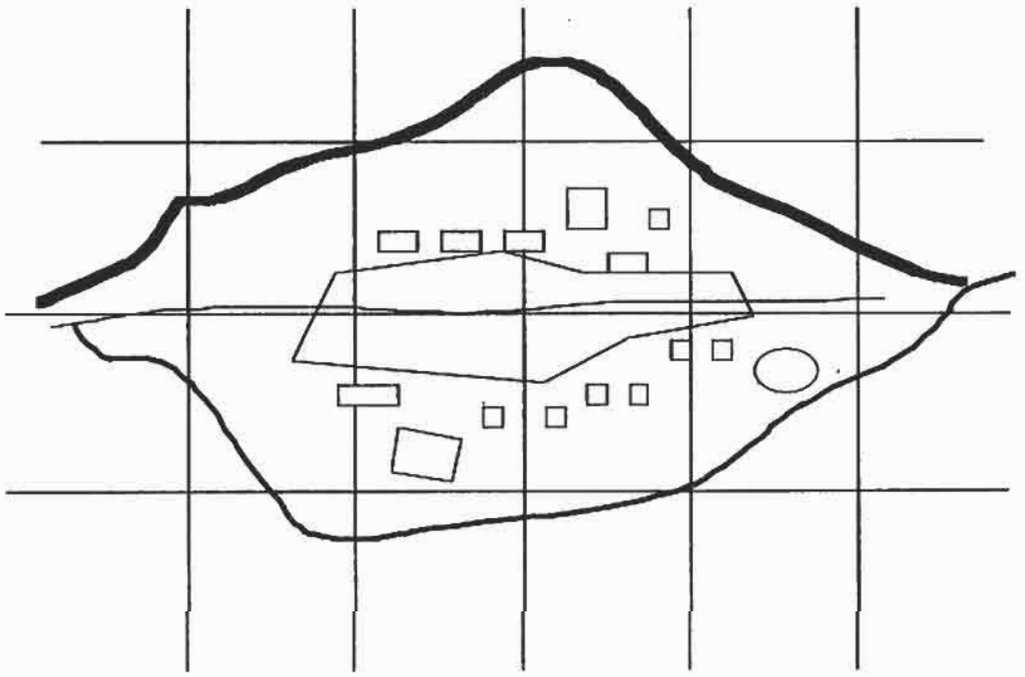
At the end of this session, the meeting should have achieved the following:

- Generated a list of the main local decision making organisations and gained an idea of their mandate;
- Got an indication of how many people are involved in each forum/ group/committee/council;
- Obtained a base map for the later part of the process;
- Make the process a visual one so that the outcomes can be easily shared and verified.

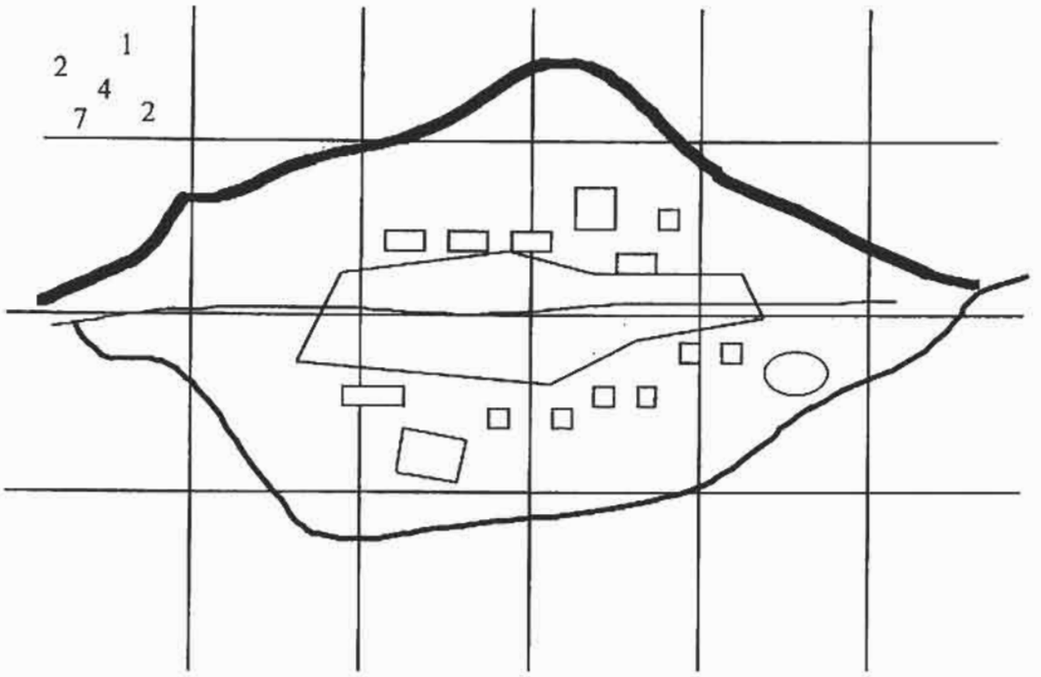
Cross-referencing resources and groups responsible for resources.

Procedure:

Draw a rough square grid (with pencil, biro or thin end of marker pen) on to each map (social and resources);

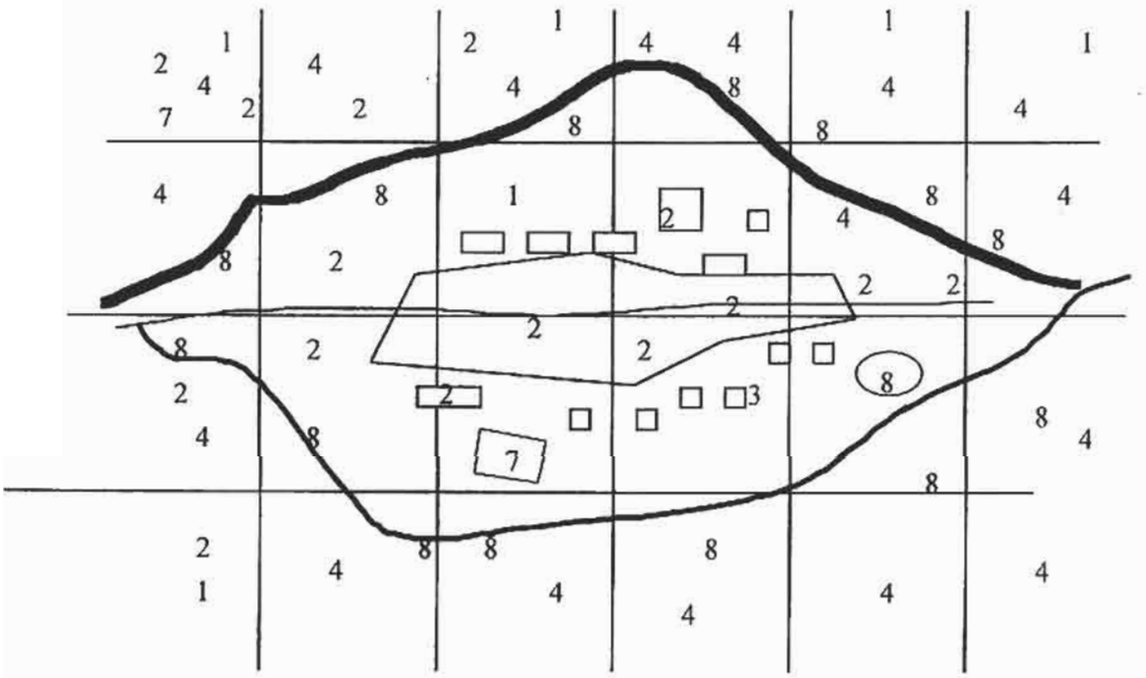


Starting with the top left hand corner "square", ask the participants which group(s)/local institution(s) make decisions about each part of the area/features in the square and ask one of the participants to write the number or symbol of the group(s) named in the appropriate place(s).



Before going on to the next square, ask if there are different decision makers in different seasons or during crisis periods (such as drought) and give the participants different colours of markers to write in the appropriate number(s). Ask if there are any external institutions (official or neighbouring settlements) which have management responsibilities or agreements for the area in the square. If there are any additional local groups or external bodies which emerge as a result of these questions, add their name to the table and give it a reference number or symbol.

Move to the next square (any direction) and follow the same process. Complete for all the squares perhaps asking different participants to complete different squares (starting at different corners).



Ask one of the participants to present the finished map to other local people, especially elders, and ask if they agree. Ask them to make any agreed changes and additions.

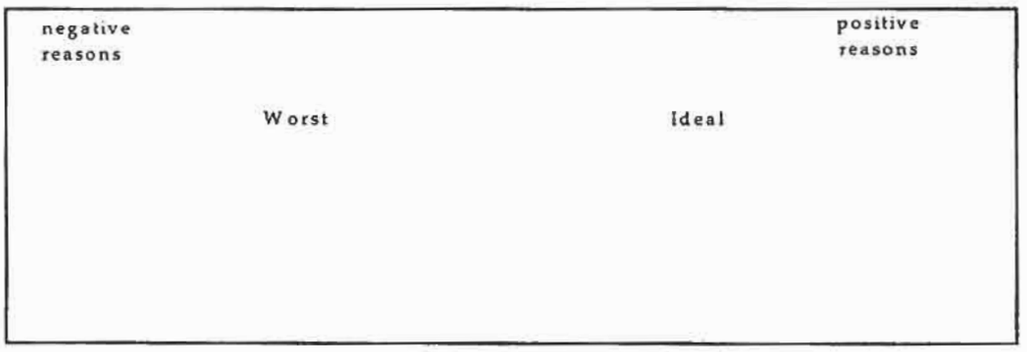
At the end of this session, the group should have achieved the following:

- Obtained an indication of which groups are responsible for specific resources and/or areas and features;
- Made the process a visual one so that the outcomes can be easily shared and verified;
- Obtained a base map to assist with identifying partners for future project formulation, implementation, monitoring and evaluation.

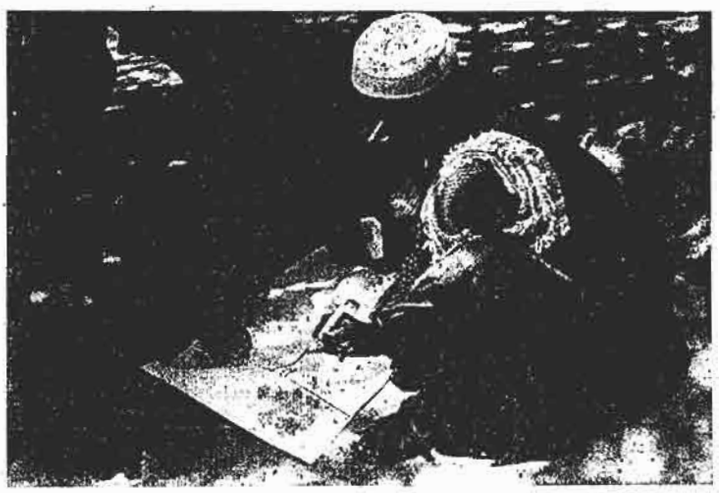
Tool 3. The H form and community current situation assessment

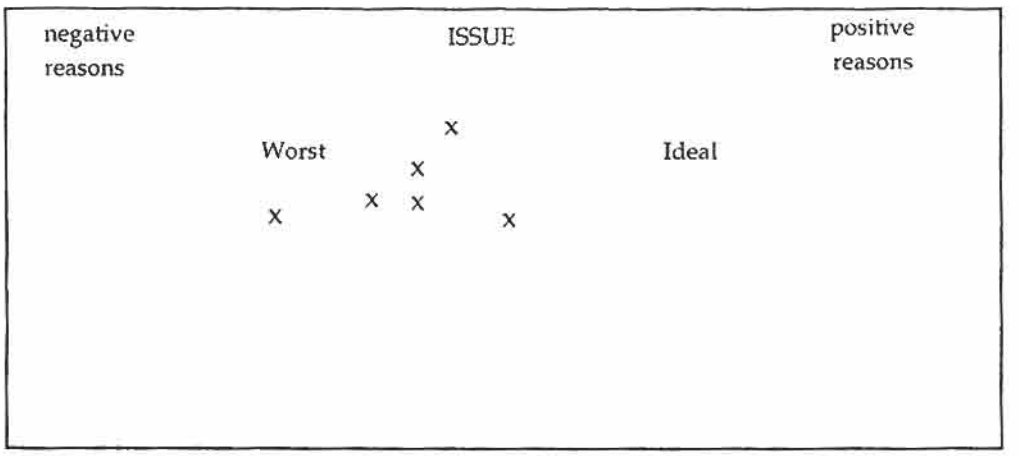
The difficulty in involving communities in monitoring and evaluation arise from lack of effective tools to enable communities identify indicators that are meaningful to both the community and intervention planners, and that meet the criteria for good quality indicators. The assessment form (or H form) is a tool used to assist communities identify indicators indirectly. Instead of asking for indicators it asks the communities to assess their well-being and that of their environment in relation to a desired state. This is followed by asking for the reasons the individuals have for the assessment. The reasons are then converted to indicators in the process described below. To aid this exercise the facilitator should use visual aids as much as possible. S/he should prepare several of the "H" forms shown below, by cutting a flip chart paper into two halves and drawing two vertical and one horizontal line.

Procedure

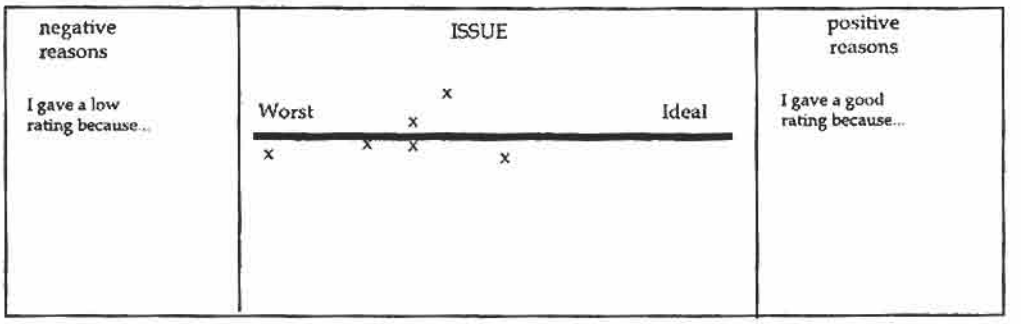


ii. Focusing on the issue of interest (e.g. water, agriculture or issues raised during a participatory planning exercise), ask each person to mark a cross on the line which would indicate what score they would each give their present situation with regard to the worst and ideal situations, which score 0 and 10 respectively;

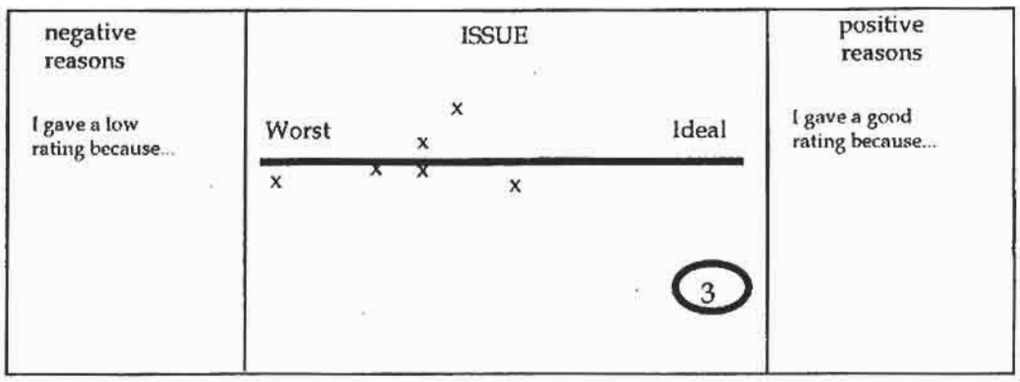




iii. Ask each person in the group to write the reasons for giving their score (or if they can't write to ask somebody to write it for them), the negative reasons in the left hand side column of the scoring sheets. the positive reasons on the right;



(iv) Ask the group to agree on the rating (try to ensure that the reasons help to inform the discussion and not one or two individuals dominate the decision making) and write it clearly on the sheet, e.g. the group working with the H form below agreed on a rating of 3 out of ten regarding water;



The procedure should be repeated per each issue of interest (water, animal health etc.).

(viii) Bring all the groups together again to negotiate a common rating (see example of several negotiated issues from the testing of the tool by Haraf community, Hargeisa District, "Somaliland", in the table below.

(ix)

Priority Issue	PERCEIVED PRESENT SITUATION Worst — Ideal	(negotiated rating)
Agriculture		3
Animal health		2
Poultry		0
Human health		4
Education		4
Water		3

The next step will be to sort out the reasons and convert them to indicators. It is office based, and involve only project staff and facilitator (if not part of project). You should end meeting, thanking all those present and inform them of the next steps and what follow up they can/should not expect. The reasons generated can be converted into indicators using the method described under tool 4 (converting reasons to indicators).

Tool 4: Converting reasons to indicators

Rationale

Not all the reasons given meet the criteria for good quality reasons. Indeed not all indicators we think of meet the criteria for quality indicators. Quality reasons shortlisted for possible conversion to indicators are those deemed to be specific, relevant, measurable, timely and feasible (see table below for meanings).

Specific	An indicator should be specific to the issue in question
Relevant	An indicator should reflect what we are trying to measure in an accurate way
Measurable	An indicator should be measurable in either qualitative or quantitative terms
Timely	An indicator should provide information in a timely manner
Feasible	Measurement of an indicator should be feasible in terms of finances, equipment, skills and time available

Converting reasons to indicators is a two step process. The first step is to select quality reasons and the second step is to convert the quality reasons to indicators.

- **Step 1 Selecting quality reasons**

Procedure: (*Reasons used in this illustration were obtained from field testing of the tool in Haraf village, Hargeisa District).*

i. Make a matrix with the following format and headings:

REASONS FOR RATINGS	CRITERIA FOR SHORTLISTING REASONS

ii. List all reasons given on all the "H sheets" in the first column.

REASONS FOR RATINGS	CRITERIA FOR SHORTLISTING REASONS
The number of bad cement reservoirs	

iii. Taking one reason at a time, ask the following questions: Is it specific? If yes, put an "S" in the column. If no, then go immediately on to the next reason for ratings.

REASONS FOR RATINGS	CRITERIA FOR SHORTLISTING REASONS
The number of bad cement reservoirs	S

iv. Ask if it is relevant. If yes, put an "R" in the column and go to next question. If no then go on to the next row/reason for ratings.

REASONS FOR RATINGS	CRITERIA FOR SHORTLISTING REASONS
The number of bad cement reservoirs	SR

v. Ask if it is measurable? If yes, put an "M" in the column. If no then go on to the next reason for ratings.

REASONS FOR RATINGS	CRITERIA FOR SHORTLISTING REASONS
The number of bad cement reservoirs	SRM

vi. Ask if it is timely. If yes, put an "T" in the column. If no then go on to the next reason for ratings.

REASONS FOR RATINGS	CRITERIA FOR SHORTLISTING REASONS
The number of bad cement reservoirs	SRMT

vii. Ask if it is feasible to use as an indicator (e.g. would it be within available budgets, commitments and available capacity to measure it)? If yes, put an "F" in the column.

REASONS FOR RATINGS	CRITERIA FOR SHORTLISTING REASONS
The number of bad cement reservoirs	SRMTF

viii. Go on to the next reason and repeat process (i.e. start with "is it specific").

ix. Continue until all reasons have been assessed for possible shortlisting (see example of reasons identified during the tools testing exercise with the community of Haraf village, Hargeisa District, "Somaliland" below).

REASONS FOR RATINGS	CRITERIA FOR SHORTLISTING REASONS
The number of bad cement reservoirs	SRMTF
The number of bad earth water reservoirs	SRMTF
The number of bad wells One well is working correctly Shallow wells are not well dug Shallow wells are short Some wells are dug, others are collapsed	SRMTF
Shortage of water runoff in the river bed	SRM
Shortage of water stream this year	SRM
Increase or decrease of water-borne diseases.	SRMTF
Water distant to some of the village communities. Distance to permanent water points is shortened. Minimisation of water fetching burdens.	SRMTF
Shortage of shallow wells	SRMTF
Water goes down during crisis	xxx
Clear water shortage to the village community	xxx

Wells require cover-slab	SRMTF
One well has cover-slab	SRMTF
One well is permanent	SRMTF
Lack of cement and earth water reservoirs	SRMTF

Step 2 Converting quality reasons to indicators

Reasons that do not meet all the criteria should be discarded. For every reason that met the criteria, it is converted to an indicator by simple re-statement. (see example below)

ISSUE	REASON	INDICATOR
Potable water	Wells require cover slab	Number of wells with cover slab
	Water borne diseases	Incidents of water borne diseases
	One well is working correctly Shallow wells are not well dug Some wells are dug, others are collapsed	No. of fully functional shallow wells
	distance to permanent water points is long	Distance from village to permanent water points
	Lack of earth and cement water reservoirs	No. of earth and cement water reservoirs in the village
	One well is permanent	Number of permanent well in the village
	The number of bad wells, cement and earth reservoirs.	Quality of water from wells, earth and cement reservoirs

In theory some indicators identified by the community may fail this quality testing, thereby loosing out. However during the field testing of this method in Haraf village it became clear that while the quality testing reduced the number of indicators, none were lost, as one indicator will be stated in many ways, some specific some non-specific.

Tool 5 Selecting methods for measuring change.

For each indicator, brainstorm/list the possible tools (both participatory and non-participatory) that could be used to measure change. (see example using Haraf outputs).

ISSUE	INDICATORS	PARTICIPATORY TOOLS	NON-PARTICIPATORY TOOLS
Potable water	Number of wells with cover slab	mapping, transects	inventory, water quality tests, observations
	Incidents of water borne diseases	mapping, transect walks	inventory, water quality tests, observations
	No. of fully functional wells	social and health mapping, body mapping, semi-structured interviews, trend diagrams	hospital records, drug sales records
	Distance from village to permanent water points	mapping, seasonal calendars, transect walks.	inventory, questionnaire survey
	No. of earth/cement water reservoirs in the village	mapping, transect walk	inventory, records
	Number of permanent well in the village	mapping, transect	observation, records, inventory
	Quality of water from earth/cement reservoirs	semi-structured interviews, social mapping	Water quality tests.

TOOL 6 THE LOGICAL FRAMEWORK ANALYSIS (LFA, LOGFRAME)

The logical framework has gained importance particularly within donor funded projects as a planning tool. Many projects however look upon it as an inconvenient donor requirement that has to be fulfilled before funds are disbursed. The common practice is then to formulate project goals, objectives and activities, and then fit them within a logframe. This is an unfortunate misuse of a tool that has much more positive potential for project planning and monitoring.

What is the logframe?

Shields (1993) described logframe as a set of tools that when used creatively improve planning, designing, implementing, monitoring and evaluating of projects. Its ultimate aim is to generate indicators of change, specifying who will measure them and how they will be measures. It consists of three phases: preparation, analysis and planning.

Step 1: Preparation

Ideally the logical framework should be formulated in a workshop involving key stakeholders (see tool for identifying stakeholders). In addition to usual workshop preparations this phase will include identifying stakeholders and familiarising them with the issues to be dealt with in the workshop.

In some cases the differences between the stakeholders may be so large that it may not be possible or productive to bring them together. Such differences can be geographic, social, economic or political. For example the Somali Natural Resources Programme is charged with the responsibility of drawing management plans at village, district and national level. Bringing stakeholders together from the various resource user levels and geographic locations in a single logframe exercise is unlikely to be feasible or productive. As Jackson (1997) suggested, the alternative

approach is to hold a series of logical framework workshops. A participatory learning and planning approach may be used at the village level whose results feed into a series of logframe workshops at the level above and so on.

Before the logframe exercise commences, the workshop participants have to establish as clearly as possible the historical background of issues relating to the intended project, the current socio-economic situation, the needs of various stakeholders, and the various options for the future. Related to these issues, the group needs to know the general areas of concern, or themes, that the project will focus on, the level at which the project will focus in terms of subject (broad or specific or both), what the project aims to achieve, who the major stakeholders are, who will implement the project, the intended duration of the project, and other interventions/projects planned for or being implemented in the proposed project area.

Other seemingly minor issues such as where the logframe exercise will be held, who will facilitate, when the background material will be distributed and read, and the facilitation materials and logistics required have to be dealt with as ignoring them can ruin a good workshop.

Step 2: Analysis Phase

This is a three stage phase comprising analysis of problems, analysis of objectives and analysis of strategies.

i. **Analysis of the problems.**

To set the stage for analysis of problems, it is usually more productive to start by establishing a vision. This is done by simply seeking the answer to the question; where do we want to be/ what do we want to achieve in x number of years, given the background information discussed in the preparation stage. For a successful analysis exercise it is necessary to get all workshop participants contributing, by brainstorming. To achieve this it will be necessary to set up some brainstorming rules such as all ideas are acceptable without argument, there will be no debate on the ideas at this stage, all ideas are recorded as long as they have not been recorded before. These rules aim for quantity of ideas rather than quality. If the logframe is being derived from existing project/programme, the problem analysis is easier as they are already defined and the exercise should proceed to the next stage.

- **Identifying the main Problems:** Once the vision has been established (revised for on-going projects) the process of identifying and analysing problems can begin. This is best achieved by seeking the answer to the question "what are the obstacles in the way of our mission achievement"? The answers to this question should be written on cards or post-it notes and displayed where everybody can see them. This can be done in small groups with each group listing what they see as obstacles, collating this in plenary session. In as far as possible, participants should identify the root causes of the difficulties they experience or expect to experience, rather than the superficial or symptomatic explanations. Descriptive words such as 'lack of' should be avoided and replaced by the real reason leading to the "lack of".

- **Developing the problem tree:** After all the underlying problems are generated, they should be displayed in a convenient place where everybody can see them. They should then be clustered into groups addressing similar issues. Problems that are clearly irrelevant or that cannot be addressed within the current scope of the project can be discarded at this point. The group can also add new problems that may not have come up during the brainstorming. It is important to attach an appropriate title to each cluster of problems, summarising the major issue highlighted by the cards under it. The problem tree is then developed by examining the relationships between the clusters. Higher order problem clusters go high up on the wall, same order clusters go beside each other while lower order clusters go below. It is easier to start with one problem the participants agree is of major importance and to place it anywhere on the wall. Pick each of the remaining clusters, if the problem is a cause of the starter problem it goes above it. If it is an effect of the starter problem then it goes below it. If it is neither a cause, nor an effect, then it is the same order problem and it goes besides the starter problem. An example of a problem tree is given below.

- **Analysis of objectives**

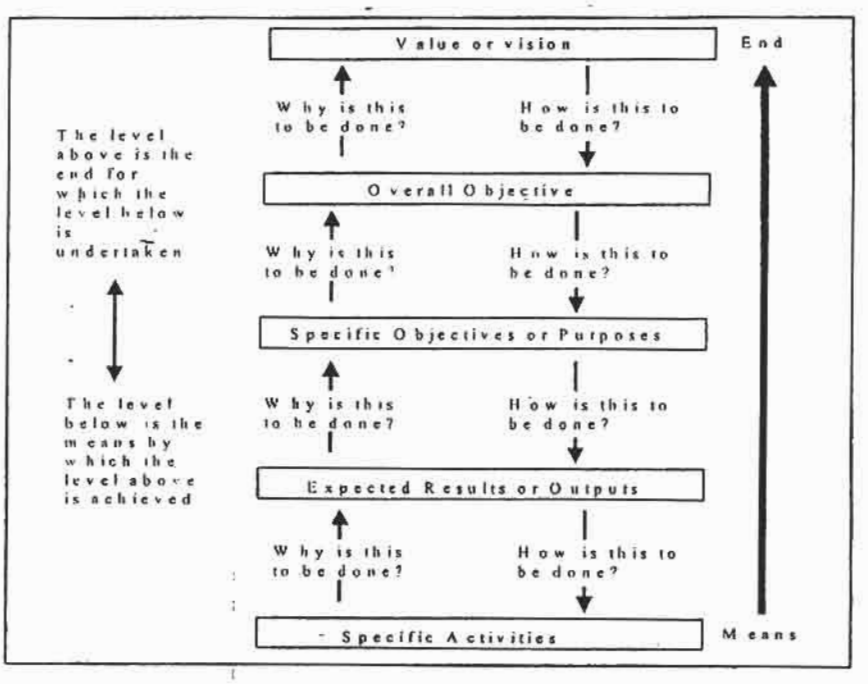
The easiest is to turn the problem tree to a positive mirror image (Shields, 1993) by restating the problems as objectives. If the relationships between problems in the problem tree was well developed with lower level problems being the cause of higher level problems, the objectives tree becomes an 'ends - means' diagram (Jackson, 1997). The top of the tree is the desired end and the lower end of the tree is the means to reach the end.

- **Testing the logic of the tree**

Once the objective tree has been developed it is important to check the logic of the relationships. The intent structure, force field analysis and SWOT (analysis of strengths, weaknesses, opportunities and threats) are some of the many tools that can be used.

- **The Intent Structure Analysis:** Described by Lee-Smith (1997), the intent structure is adapted from systems engineering. It is an 'ends - means' diagram that shows the values, goals, objectives and detailed actions of components of any purposeful system such as an organisation, programme or project. The intent structure can be used to check the logic of the objectives tree by checking to see that each lower level of the tree shows how the next level is to be achieved, and that each higher level objectives shows what will be achieved by doing the lower level.

The Intent Structure (Lee-Smith, 1997).



Step 3 The Planning Phase

So far the other steps have generated objectives, purposes, expected outputs and activities and checked the logic in the relationships of the various levels. The planning phase involves generating indicators, means of verification and assumptions at each level of the objectives tree. This is done by simply converting the tree into a matrix as shown below.

INTERVENTION LOGIC	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
Overall Goal			
Results			
Purpose			
Activities			

Indicators

These are the means by which we shall know whether our actions are having desired effects, and should be objectively verifiable. The following criteria was modified from Jackson (1997) to determine whether indicators should be included or not.

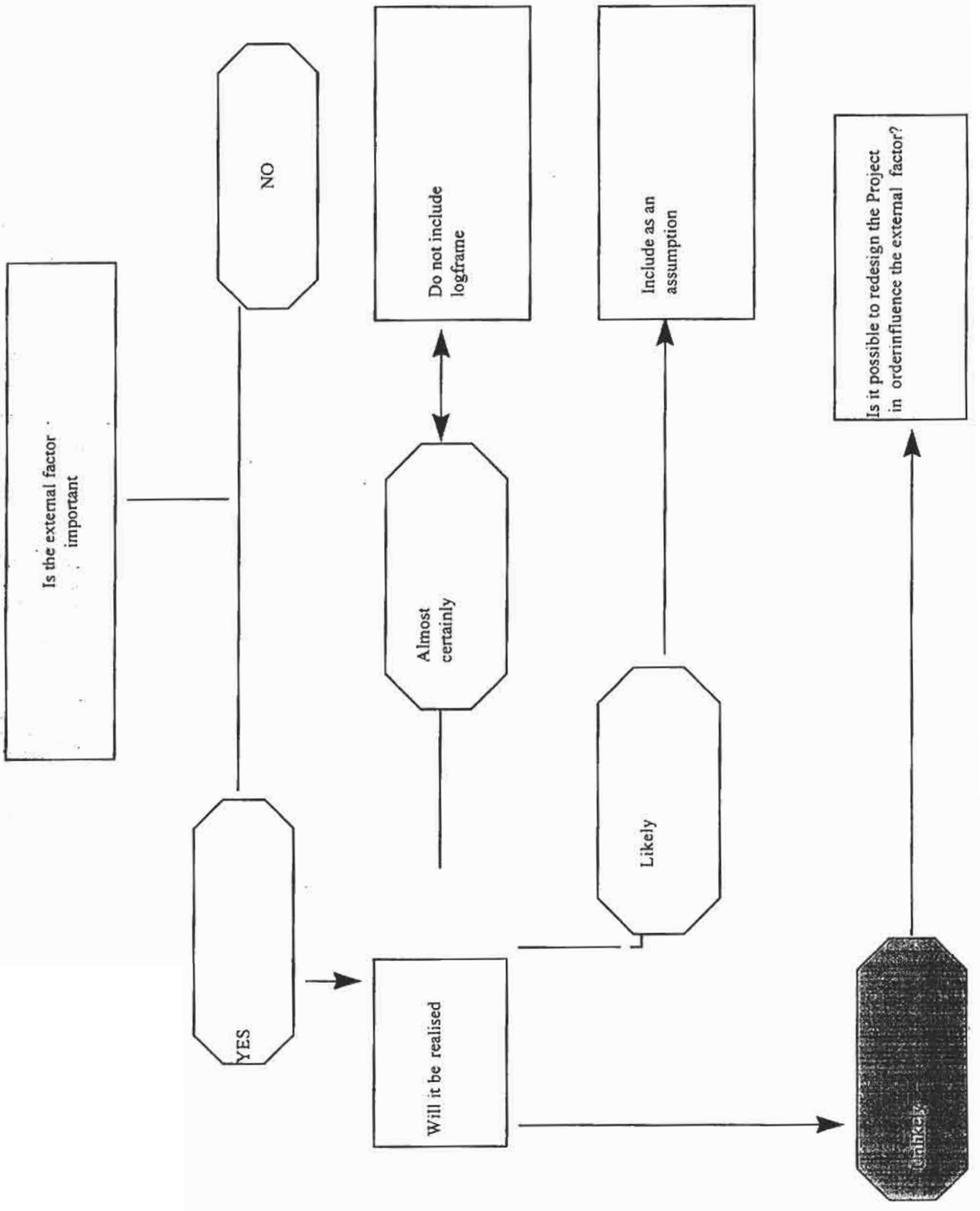
Means of Verification

It is important to think about the means of verification of an indicator from the outset. This will include the source of information and the means of collection. This is like stating the feasibility of an indicator, stating whether measurement can be done within a reasonable amount of time, effort and money. It should indicate the format in which the information will be made available (reports, records, publications etc.), who should provide the information, and how regularly the information should be provided.

Assumptions

Assumptions are factors likely to affect the success of the programme/project that are outside the control of the programme/project staff. The purpose of thinking of these assumptions at the planning phase is to realistically be aware of the chances of success of the project. If situations likely to lead to project failure exist they are discussed now and ways to address them found. If they cannot be addressed, then the objective, result or activity which is affected by this assumption is dropped. Jackson, (1997) provides an algorithm to sort out important assumptions with.

Source of algorithm Shields, 1993.



TOOL 7: PRAM (PARTICIPATORY REFLECTIVE ANALYTICAL MAPPING)

To allow data desegregation, this tool breaks nature into two distinct systems: the human (socio-economic), and the biophysical (ecosystem). Each of these systems are further broken down into dimensions, indicative issues, and finally indicators. Dimensions are universal sets of issues that need to be considered by any society. For ecosystem well-being they include land, water, air, biodiversity and resource use. For human well-being they include economic production, health, population, wealth and livelihood, knowledge, behaviour (Prescott-Allen, 1997).

Indicative issues are widely (but not always) applicable issues that represent a dimension. For land, they include degradation, soil erosion, etc. For water, they include fresh water quality, marine water quality and water use, etc. Table 1 shows the differences between ecosystem and human dimensions. Table 2 and 3 show the details and relationships of dimensions, indicative issues and indicators. Once the indicators identified and measurements taken, they are desegregated using the information in these tables as a guide. It is to be noted that some issues will not be easy to fit in either category and the individual using the table has to use their best judgement where the case are not clear cut. The point is, this is a starting point to desegregate data on the two systems.

Distinction between Social and Biophysical Dimensions.

ECOSYSTEM (BIOPHYSICAL)	HUMAN (SOCIAL)
Land	Health and population
Water	Wealth and livelihood
Air	Knowledge
Biodiversity	Behaviour and institutions
Resources use	Equity

(Adapted from Imbach and Dudley, (1997)

Ecosystem Dimensions and examples of indicative issues and indicators

DIMENSION	INDICATIVE ISSUE	INDICATOR
Land	Land conversion or naturalness	Proportion of land converted from natural state
	Land degradation	Eroded land as a % of land area
Water	Naturalness of water bodies	Proportion of water impounded
	Fresh water quality	pH, algae, feacal coliform, PCBs
	Marine water quality	pH, algae, feacal coliform, PCBs
	Water use	Water extracted as a % of supply
		Disposal of solid wastes
Air	Local air quality	Ground level of 03, SO2, CO, H2S (10 local particulates)
	Condition of the atmosphere (greenhouse gasses, ozone depletion)	Production of ozone depleters
Biodiversity	Ecosystem diversity	Threatened vegetation types as a % of all indigenous vegetation types
	Species diversity	Threatened species as % of total species % crop/livestock compared to 25 years ago
	Genetic diversity	
Resource use	Food and agriculture	Soil loss as % of soil formation
	Fishing and aquaculture	Catch/year as % of optimal sustainable yield
	Trapping and other wild resources	Wild vegetation no longer available
	Logging	Volume logged/area/year as a % area regenerated
	Mining, quarrying and oil drilling	National energy/GDP ratio (megajuoles/US$)
	Energy	No. of visitors to reefs/ha/year
	Recreational services and tourism	Area damaged/other pressure
	Ecological efficiency of resource use	Stress versus benefits
	Waste generation and disposal	Volume recovered/reused/recycledas opposed to disposal
	For each of the above sectors	What are the main resource industries?

(Source: Prescott-Allen, (1997).

Human Dimensions with examples of Indicative issues and indicators.

HUMAN DIMENSION	INDICATIVE ISSUE	INDICATOR
Health and population	Fertility and population Mortality, disease and injury Food and nutrition Psychological health Health services	Births per 1000 Fertility rate Deaths per 1000 % people who eat once per day or less Life expectancy at birth Infant and maternal mortality
Wealth and livelihood	Income (including debt and poverty) Employment Leisure Housing Transport Settlements and infrastructure	Average annual income % unemployment Proportion of working age population employed Average hours/week work for women and men % rough earth floor houses % public/private transport % walking (Number of trips, trip miles) % access to safe water % access to safe sanitation
Knowledge	Education Research Communication Information technology	Adult literacy Girls in secondary schools Primary schools per capita % pop. With tertiary education R&D scientists/10,000people Newspaper copies/100 people Radio or TV/100 people
Behaviour and institutions	Family stability Community empowerment Human rights Conflicts and violence Laws and incentives Organisations and management	Rights to practice religion Detention without charge/1000 people Freedom of assembly Prisoners/1000 people rapes/1000 women Homicides/100,000people Mechanisms to integrate human and ecosystem well-being
Equity	Disparities in well-being among different groups	Shared income distribution (ratio between top and bottom 20%) School enrolment women/men Income share women/men Life expectancy women/men Decision making women/men

(Source: Prescott-Allen, (1997).

TOOL 8: THE BAROMETER OF WELL-BEING

Described by Prescott-Allen(1997) in his book 'The well-being of Nations' (In Press), the Barometer of Well-being is a tool for measuring progress towards achievement of sustainability, measured as progress in well-being of both the human and biophysical systems. The well-being of both systems is illustrated on a simple graph showing the condition of the social system on one scale and the condition of the biophysical system on the other scale, thereby comparing them. The simple graph consists of a performance scale with two axes, one for an index of human well-being and one for an index of ecosystem well-being. Each axis has a maximum possible value of 100%, divided into five sections as follows:

0 - 20 = bad;

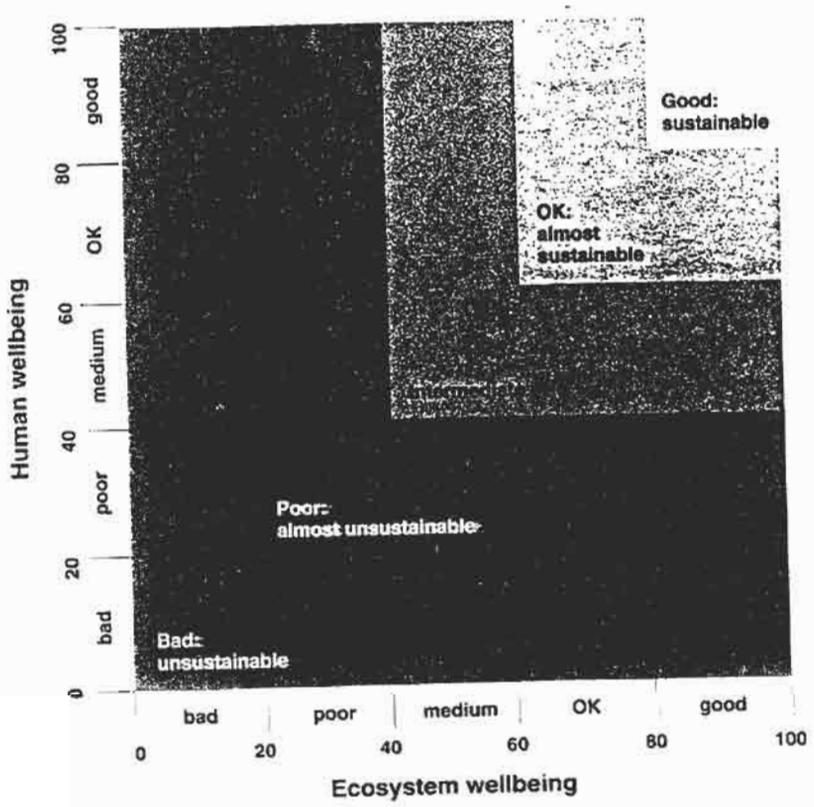
20 - 40 = poor;

40 - 60 = medium;

60 - 80 = OK;

80 - 100 = good.

The Barometer of Well-being (Source.. IUCN, 1997.)



The intersection of the two points provides a reading of overall well-being. The Barometer therefore provides a systematic way of organising and combining indicators so that users can draw conclusions about the conditions of people and the ecosystem and the effects of people-ecosystem interactions.

By separating the human and ecosystem well-being indices, the barometer aims to ensure that an improvement in one system does not mask a decline in the other. It also ensures that a lower score on one axis overrides a higher score on the other, such that the overall well-being is based on whichever subsystem is in worse condition. This is to prevent an improvement in one system being read as compensating for a drop in the other, preventing a trade-off between human and ecosystem well-being.

The Barometer of Well-being can also be used merely as a communication tool to show progressive improvements (impact) of project activities. In Zimbabwe, IUCN DEAP (District Evaluation and Assessment Team) used the Barometer as a tool to measure and communicate progress of the community's action plans, goals, and objectives (Chimbuya, 1996). As a tool for local level monitoring and evaluation, the Barometer can be adapted to provide a visual presentation of the monitoring and evaluation results, that is comprehensible by every one, from villagers to policy makers.

To use the Barometer of well-being for communication, information has to be analysed to reflect conditions in the human (socio-economic) and biophysical (ecological) systems. This process is referred to as desegregating indicators and is described below.

- **Desegregating indicators, issues, dimensions and system values.** Indicator values for one indicative issue must be aggregated to calculate the value for the relevant issue. The issues values are in turn aggregated to give a value for the dimension. Imbach (1997) identifies three ways in which the aggregation process can be done; simple averages, weighted averages, and minimum criterion.

a. Simple averages

Simple averages are used when indicators are of equal importance. E.g. if indicators a, b, and c had values of 4, 6 and 8 respectively, the simple average will be $4 + 6 + 8 = 18/3 = 6$.

b. Weighted averages.

It is rare that indicators will be of equal value. A weight factor is given to each indicator to reflect its importance in determining well-being relative to other indicators. If a community feels that a was more important than b and c, and that c was more important than b, they might weight them as 4 for a, 2 for b and 3 for c. The weighted average calculation is as follows: $(4x4) + (6x2) + (8x3) = 52$. The weight factor calculation is $4 + 2 + 3 = 9$. The weighted average = $52/9 = 5.6$.

- **The minimum criterion:** The aggregate value always assumes the value of the least indicator/issue measurement. In our example, the aggregate value would simply be 4. The purpose of this system is to avoid the balance effect, through which good qualifications in any aspect balance and therefore hide bad situations.

Procedure

i. Ideally one would ask the community to identify priority issues (following the method described in Tool no. 1 and arrange them in a priority matrix as in the following example. (data from the testing exercise in Haraf village, Hargeisa District).

PRIORITY CHANGE ISSUE (as expressed by community using tool 1)
Agriculture
Animal health
Poultry
Human health
Education
Water

ii. Add to this table the community negotiated ratings determined by the Haraf community using Tool no. 3.

ISSUE	RATING
Agriculture	3
Animal health	2
Poultry*	0
Human health	4
Education	4
Water*	3

iii. Using the guidelines provided in tables 1 to 3 of the Barometer of well-being (Tool no. 6) classify each issue identified in the priority change matrix as biophysical (ecosystem) or socio (human system).

ISSUE	SYSTEM	RATING
Agriculture	Ecosystem	3
Animal health	Ecosystem	2
Poultry*	Ecosystem	0
Human health	Human	4
Education	Human	4
Water*	Human/Ecosystem	3

NB. In some cases poultry may refer directly to wealth and therefore be classified as human. Water here referred to both potable water and water for irrigation, hence classified as both.

iv. Separate the biophysical from the social issues and make two new tables as follows.

Socio-economic (human) system issues

ISSUE	PRIORITY NUMBER	RATING
Human health	1	4
Education	2	4
Water	3	3

Biophysical (ecosystem) system issues

ISSUE	PRIORITY NUMBER	RATING
Agriculture	1	3
Animal health	2	2
Poultry*	3	0
Water	4	3

v. Calculate Well-being using priority number as a weighting factor.

Count the number of issues in each table. Since the ranking in the table is based on prioritisation by the community at the generation stage, the first issue on each table assumes the highest ranking. The socio-economic used in this example has 3 issues, therefore the highest ranked, human health, has a weighting factor of 3 (see table below).

Socio-economic (human) system issues

ISSUE	PRIORITY NUMBER	RATING	WEIGHTING FACTOR
Human health	1	4	3
Education	2	4	2
Water	3	3	1

The well-being for the socio-economic system is calculated as follows;

$(4x3) + (2x4) + (1x1) = (3+2+1) = 21/6 = 3.5.$

Similarly, calculate the well-being of the ecosystem as illustrated below.

Biophysical (ecosystem) system issues

ISSUE	PRIORITY NUMBER	RATING	WEIGHTING FACTOR
Agriculture	1	3	4
Animal health	2	2	3
Poultry*	3	0	2
Water	4	3	1

The well-being for the ecosystem is calculated as follows;

$(3x4) + (2x3) + (0x2) + (3x1) / (4+3+2+1) = 21/10 = 2.1.$

vi. Draw a barometer of well-being

TOOL 9 MAP MAKER GIS

Map maker is a simple GIS designed to allow both expert and non-expert users to create and manipulate maps on basic personal computers. It is simpler to use than standard GIS programmes e.g. IDRISI, ARC/INFO. Written by Eric Dudley, a member of the IUCN/IDRC international group developing field based tools and methods for monitoring and evaluation and assessing sustainability, it was originally designed to give community development workers in all sectors the power to create maps of their project areas using personal computers.

Key features of Map Maker GIS

Map Maker is a vector based GIS that organises geographical data using both a relational and topographic model. To achieve this it uses several the following supporting features:

- Drawing - A range of drawing tools makes it easy to produce freehand maps, to work with an on-screen grid and trace over existing images. These drawing tools permit you to draw polygons, lines and symbols (see Dudley, 1997);
- Data base - Map Maker uses an in-built D-base III as the relational data base management system that stores and performs operations on attributes (descriptive non co-ordinate data). ASCII and comma separated files and data surface files are also supported. These data files allow the user to create and manage geo-referenced tables and thematic data including numbers, dates, text, and references to related tables of interpretative data and graphic symbols that are automatically linked to map features in the topographical structure;
- A display style and map furniture tools support the powerful map production and display characteristic of Map Maker.

As a tool for supporting a community based monitoring and evaluation system, a GIS should be evaluated on cost, technical features (digitising requirements, data analysis power), hardware requirements, level of previous experience required to use fully, and further training required to fully operate.

Cost.

Map Maker exists in two versions today. Map Maker shareware version and Map Maker Pro 2.0. The shareware version costs less than 200 Sterling pounds while Map maker Pro 2.0 costs less than 300 Sterling pounds. The difference in cost is due to differences in capacity to process data. The soft ware is updated regularly.

Technical features

(i) Data input and storage (digitising)

Data input is the most time consuming phase of standard GIS systems. It covers the aspect of transforming data into a compatible digital format, consisting of three stages:

- Entering the spatial data
- Entering the non-spatial data
- Linking the spatial to non-spatial data

The usual process is that analogue maps are either manually digitised or scanned using an electronic digitiser or a scanner respectively, connected to a local computer. This is followed by several rounds of cleaning, building and editing of the map coverages/layers. Map Maker does not yet support a digitising board and obtains data through scanning and on screen digitising. Nevertheless, the capacity for on screen digitising allows sketch maps identified by local people to be digitised, and analysed. *This is important because other GIS programmes cannot incorporate* maps without precise co-ordinates and scales, thereby excluding community generated maps. The capacity to support standard maps with co-ordinates makes Map Maker a powerful tool to combine field based maps with standard information.

(ii) Data Analysis

Map Maker has powerful data analysis tools including overlaying of layers, questioning of data layers and combination of data layers, display according to defined or calculated conditions and exporting images to word processors. However, Map Maker will import data from ArcInfo, Atlas, Idrisi and AutoCAD only through DXF files.

(iii) Support for Surveying

Unlike standard GIS programmes, Map Maker is equipped with practical information to support field surveys and to convert survey data into maps. The Software allows for geo-referencing of maps on any projection. It also supports GPS, the simple hand-held Global Positioning Systems, which read geographical locations by connecting with US Positioning Satellites. This is a very useful facility especially for field workers who may not always have topographical maps.

(iv) Hardware Requirements

Map Maker does not require exceptionally powerful computers by today's standards. It will however not run on DOS operated computers. The 16-bit version needs a computer that works with Microsoft *Windows* 3.1, *Windows for Workgroups* 3.11, or Windows 95. While Map Maker will work on a 386 computer with 4Mb of RAM, the recommended minimum specification is a 486DX or Pentium processor with 8Mb or more of RAM. The 32-bit version will only run on a computer operating with Windows 95. The ideal screen is one displaying 256 colours with a size of 800x6000 pixels. A lap-top VGA screen with 16 colours and 640x480 pixels can also be used. It is easier to work with a conventional mouse with Map Maker on lap tops.

Map Maker will print maps directly on to any printer or plotter supported by *Windows 3.1* or *Windows 95*. It can export images for inclusion in documents produced on compatible Windows word processors, such as Micros*oft Word*, *Word Perfect* and *Lotus Ami-Pro*.

Linking community based monitoring with the remote sensing/GIS based macro monitoring system.

Community based local level monitoring and evaluation will be linked to the Remote sensing and GIS based macro monitoring system through the community generated maps. Several GPS readings have to be taken at strategic locations in the area for every community map. Once these GPS readings are fed into the Map Maker programme, and the maps digitised, the map is accessible to other GIS Software. It is important to locate unique features such as the highest hill around the community map, and the position of a bridge, road junctions, for cross checking and referencing. The macro M&E is based on ArcInfo GIS which is compatible with Map Maker files.

Recommendations on Use of Map Maker GIS

Map Maker is a simple, inexpensive yet powerful GIS. Since it allows digitising of simple participatory generated maps, it provides the link between local level community based monitoring and evaluation with the macro level remote sensing/GIS based monitoring and evaluation. Qualitative community generated information is quantified by rating, numbers that are acceptable in Map Maker GIS as information layers. Map layers can be subjected to many types of analysis, and are easy to store in Map Maker. This, of course, allows safe storage, easy data analysis, easy retrieval and up-dating of information, factors necessary for monitoring and evaluation.

Although training will be required to fully utilise Map Maker as the monitoring and evaluation management tool, it does not require exceptional talent or computers. However, for successful use of Map Maker GIS, the following issues have to be considered.

i. Level of Prerequisite Computer and cartographic Knowledge

The Map Maker manual says that one does not have to be "an expert in mapping or cartography" to use Map Maker. While I agree with this position, I would caution that a fairly good understanding of how computers function and basic understanding of cartography will make the difference between frustration and satisfaction with Map Maker. A simple GIS product, e.g. map from any GIS system is preceded by very involving iterative interactions with many different files of different types data. In Map Maker for instance, a simple map with the standard map furniture (legend, North bar, title) will be created by interactively interacting with a drawing file (to draw the map), a data base file, (creating it and linking it to the map) a bands file (to create thematic bands and link them to the database file), and a map furniture file. For more complicated map(s) the process is more complex. While none of these actions are difficult in themselves, their combinations may be frustrating for somebody without a clear understanding of computer operating and filing systems. Similarly, sorting out between map projections and co-ordinates can be frustrating for someone without previous cartographic knowledge.

ii. Map Maker Training Requirements

For Map Maker to fully support M&E, there would be need to train one person from each project implementing the system in basic cartography, basic computers and computer operating systems, and finally Map Maker itself. Minimum requirements for trainees should be six years of secondary school.

TOOL 10 MAPPING THE RESOURCE

Mapping can be done using remote sensing images such as Thematic Mapper images (TM) or a combination of data sets such as TM and aerial photos (procedure and rationale described in macro level monitoring and evaluation (IUCN. 1998)). Mapping provides a resource inventory and forms the basis of determining monitoring units such as landcover unit, range unit or land unit. The FAO Africover project is preparing landcover maps of Somalia using a combination of TM images and Russian aerial photos. These maps will provide the starting point for the local level monitoring and evaluation. However these maps are at a small scale and require some fine tuning in the process described below.

i. Ground Truthing

The maps prepared by the FAO Africover project are at a scale of 1:200,000, and are therefore lacking in detail. Ground truthing should be done to make sure that units delineated on the maps reflect ground conditions.

Step 1. Orientation

Starting with the Africover map for the area, identify the area of interest, e.g. unit of monitoring. It may be easier to locate obvious landmarks such as waterpoints and settlements firsr for orientation. Similarly, identify the position of the unit on the same map. Using a GPS, read the geographic positioning of several points to orient the map and the field area. In the field, observe the general land cover and/or land use in the unit and see if they fit the description given in the map. Repeat the observation at several sites. If land cover and/or land-use does not match the description in the map, consider updating the map with the correct information.

Step 2. Selecting monitoring and evaluation sites.

Data for monitoring and evaluation will be collected along a transect, running across the gradient of vegetation change in the monitoring unit. The gradient can either be natural, due to terrain conditions, or due to use, e.g. heavy erosion. Transects should therefore run from water points, settlements and roads outwards.

Step 3. Generating data for the unit.

To generate additional baseline data, the unit should be described under the following sub-headings:

1. Climatic factors - As much as can be obtained, record amount and reliability of rainfall, wind speed and direction. If this information is lacking, put measures in place to collect the information. A rain-gauge for instance that should be read every time it rains would be very useful;
2. Topographic characteristics - Record the slope (estimated), elevation (read from the GPS), landform, and drainage characteristics;
3. Soil properties - Texture, structure, colour, rooting depth, drainage condition and run off, consistency, sealing and crusting, acidity and electrical conductivity;
4. Current erosion type - Record any evidence of soil movement such as sheet erosion, rills or gullies.

The Resource Management and Research report (RMR, 1989) describe many parts of Somalia under the above headings during a rangeland survey conducted in the late nineteen eighties. The group established a monitoring and evaluation system whose data base is in the process of completion. Besides site description, photos of monitoring sites were taken. Permanent marks for the sites are described in the report, and together with the photographs, may be used to identify the sites. We did not make an attempt to locate any of the sites as we were not aware of their existence during the field work. Where the sites can be easily located, the information recorded will form an important baseline. The range survey and the monitoring and evaluation were meant for the whole country. As such the sampling units were somewhat general and the information provided descriptive, showing dominant plant forms, plant species, growth style, pattern of distribution, relative canopy cover, sometimes combined with climatic, geological and/or pedological qualifications. An example reads; "gypseous low sparse braided riverine Suaeda dwarf shrubland (complex) to succulent dwarf shrubland". Although this data is lacking in some details, e.g. on density, community structure, real values on ground cover, it is still an important source of general cover, useful for monitoring general trends. For instance, if the area described as "succulent dwarf shrubland" is farmland today, or "forested" area is "bushed" or "grassed" etc., this describes qualitative change in the general environment.

TOOL 11 VEGETATION COVER ANALYSIS BY THE PACED TRANSECT METHOD.

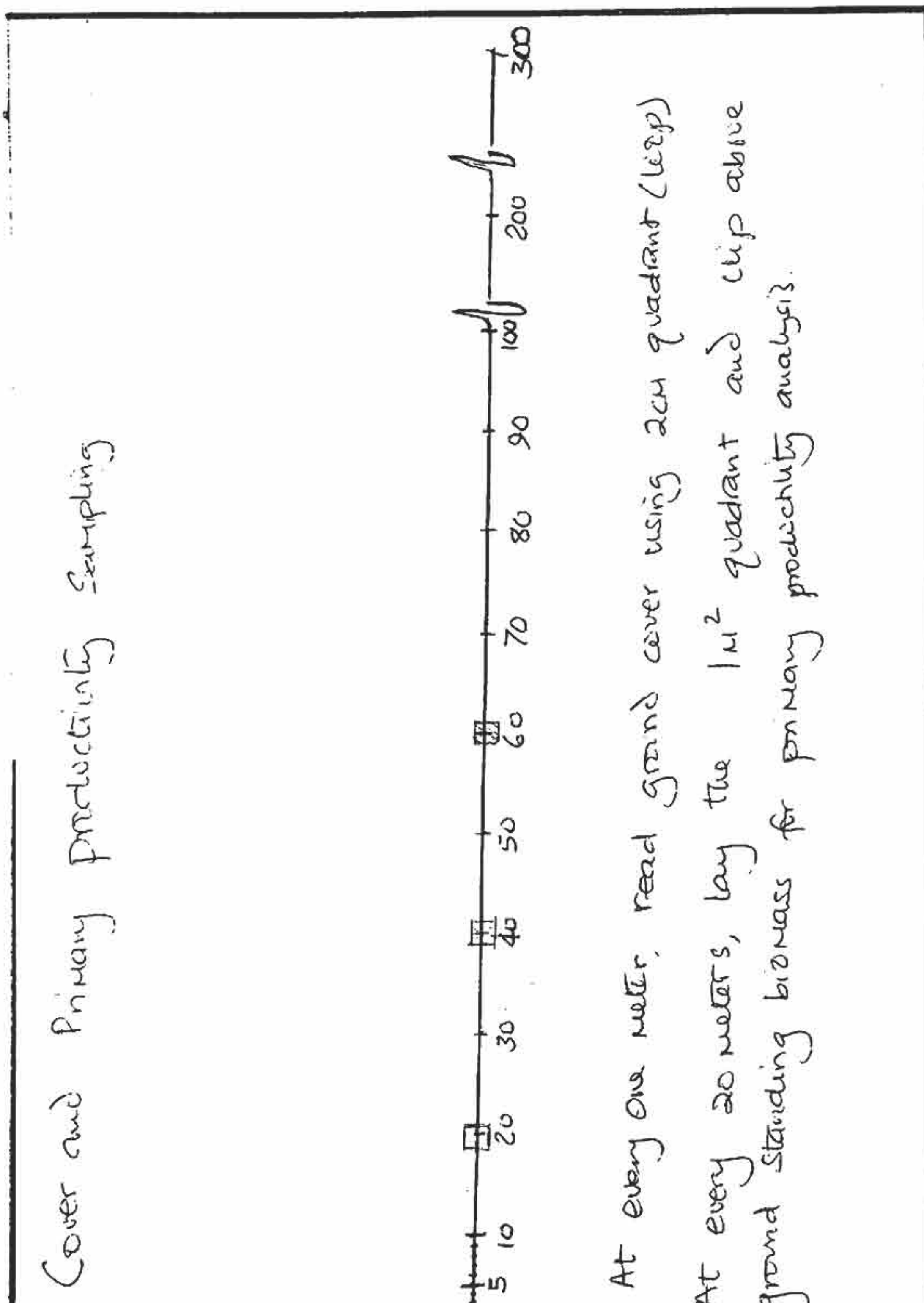
Once the description is completed, a number of observations and measurements are taken to provide data simultaneously on the cover, composition, productivity, and range condition. Widely used for vegetation analysis in dry lands, this method was developed in the United States and approved by the USDA in 1970. It is a quick method designed to determine the amount of ground cover in an area and make classification on the basis of which range condition can be judged. It was modified for use in the rangelands of northern Kenya (Lusigi, 1986), where a transect length of 100 meters replicated three times in the a continuos direction was used (see transect diagram on the following page). The method involves the following steps:

i. Select a transect starting point and read and record the GPS position for it.

ii. Select the direction and length of the transect depending on the gradient of use or topography .

iii. Using a 2cm (3/4") quadrant (metal loop) take a reading at one meter intervals. For purposes of speed, the meter intervals are paced rather than measured by tape, and the loop is placed at a marked point of the shoe of the pacer. The pacer is trained to pace one meter intervals and to use an imaginary or real guiding point in the horizon to maintain a straight direction and avoid biasing the pace. At each point, one reading, normally known as a "hit" is taken for the various vegetation attributes occurring within the loop. A perennial plant is counted as a hit if any of its parts fall within the loop. Annual grasses and herbs register a hit only if they cover at least 50% of the loop. Grass, herb and woody litter, as well as grass, herb and wood standing dead are considered a hit if they cover more than 75% of the loop. Pebbles, rocks and erosion pavement are a hit if they also cover 75% of the loop. If none of the above has been recorded, then the ground is considered to be bare.

Cover and primary productivity sketch



Within every 100 meter transect, a hit represents a direct percentage cover of the individual vegetation attribute. The percentage cover is averaged over the number of times the one hundred meter transects have been replicated. For example, if acacia tortilis recorded 20, 38, 40 and 15 hits for the first, second, third and forth lengths of the transect respectively, each of these hits constitute the percentage cover for Acacia tortilis for each of the lengths. This is calculated as (20/100) X 100 = 20 for the first length. The average cover attributed to *Acacia tortilis* for the entire transect then is calculated as (20+38+40+15)/4=28.25%. Percentage total cover can be calculated by adding up all the hits that register something other than bare ground, or subtracting the bare ground hits from 100.

Sample Data collection Form

Interval (m)	Hit
1	
2	
.	
.	
100	

It is possible to encounter more than one perennial in one loop reading, in which case primary, secondary, tertiary etc. hits are recorded. This classification is subjective, and depends on the importance of the species hit.

To understand the dynamics of the vegetation within a year and between years, it is recommended that the transect is read twice a year, at the height of the long dry season and the height of the long rainy season.

Primary productivity

Another important parameter to measure along the transect is primary productivity, as it is often seen to decline as rangelands get more degraded, and improve as the productivity of the rangelands improve. The determination of primary productivity is complicated in plant communities and involves repeated sampling in vegetation units which are protected from utilisation by as many organisms as possible. Standing crop biomass has been widely used instead of the absolute primary productivity (Lusigi, 1986), as it is quicker, easier and reliable, and is recommended for local level monitoring and evaluation. It consists of clipping all above ground vegetation (grasses, herbs, dwarf shrubs) along the transect described above. A $1m^2$ quadrant is placed at predetermined intervals and materials above 1 cm clipped. The distances between clippings depends on the volume of the vegetation, ranging from fifteen to thirty meters in dense and sparse vegetation respectively. The important thing is consistency in the interval selected rather than the interval itself. The destructive sampling of below-ground parts is time consuming and may be left out, unless it was felt they added value to the data. The clipped plants are separated by species and weighed immediately and after air drying. Air dry weights were used for analysis in northern Kenya, and would be adequate for rangeland monitoring in Somalia. For practical purposes, species with less than 1 g/plot should be bulked (see diagram of cover and primary productivity sampling on the following page).

Sample Data Collection Form

Date.....

Name of area.....

Transect Number.....

Name of data enumerator.....

Quadrant No.	Species	Wet weight	Air dry weight

To understand the dynamics in primary production within and between years, it is recommended that clipping is done twice a year, at the height of the long dry season and the height of the long rainy season.

Range condition determination

Range condition is the "relative state of health" of the range. It describes the present state of the range relative to some standard or ideal potential. It is of course not easy to determine the ideal state of the range, and the concept is not fully accepted by some ecologists. This is because in the early stages of development of the concept, rangelands the world over were rated relative to North America's rangelands. This resulted in very poor ratings, especially for African rangelands which have evolved under different climatic and management conditions from the North America's rangelands. Debate on the usefulness of range condition is especially heated on its use for determining carrying capacity (optimum number of livestock on a range unit). Regardless of its use in determining carrying capacity, trend in the range condition is a useful indicator of environmental impact of human activity (especially water development) in the rangelands.

Range condition analysis should be carried out along transects radiating out of settlements and/or water points, preferably the same transects described above. Determination of range condition is a subjective exercise, based on the data collectors judgement of the range, depending on the soil condition and amount and vigour of the vegetation. It can be rated as excellent, good, fair and poor. It is the trend rather than the rating in range condition that is important.

To understand the dynamics of range condition within and between years, it is recommended that range condition ratings be done twice a year, at the height of the long dry season and the height of the long rainy season.

Tool 12 Woody species community analysis by the Zig Zag method.

Plant density and structure

Change in density of species, especially key or indicator species is an important indicator of range condition. If desirable plants are increasing in density, the range condition is improving and vice versa. Dynamics in structure on the other hand indicate good or bad regeneration. Usually, a healthy population will have more young individuals than old. Measurements for both density and structure can be taken simultaneously using a simple method referred to as the Zig Zag method. This is method originated from the Point Centred Quadrant method, modified for speed and use in extensive rangelands Data is taken along 100 meter long transects replicated 3 - 5 times depending on the variability of the vegetation and resources available for field work. Often these transects could be the same as those described for range productivity measurements. In the Zig Zag method, the data enumerator chooses the first tree species individual available along the transect. Parameters such as species, height, crown diameter and basal diameter are recorded for the selected woody species. Observations on degree of use, such as heavily used, lightly used or not used are also recorded. Crown diameter is read by holding a tape or pacing across the area of the ground covered by the tree crown in two opposite directions, and averaging the two (see diagram on next page). The information is recorded in the form shown below.

The data collector then stands directly infront of the woody species just measured and facing in the general direction of the transect, establishes a 90 degrees angle with his feet. The area infront of the data collector covered by the projected ninety degrees angle is inspected for the next nearest woody species (see diagram). The distance to that nearest species is then either measured by tape or paced, and the parameters of the individual recorded. This continues until the entire length of the transect is surveyed. The data collector moves in a general direction, but in a zig zag manner, hence the name of the method. Woody species community analysis should be done once a year, preferably in the dry season as changes in woody species are not as dynamic as in the grass/herb layer.

Sample Data collection Form

Date.....

Name of area.....

Transect Number.....

Name of data enumerator.....

No.	Distance (m)	Species	Height (m)	Crown diameter 1 (m)	Crown diameter 2 (m)	Basal diameter (m)

Data analysis.

To obtain the density (t/ha) of plants in a given area, e.g. one hectare of land, add up the measured distances (d) between plants, divide the total distance (TD) by the number of plants encountered (N) to obtain a mean distance (md). Squaring the mean distance (md) gives mean area (ma) occupied by each plant. Dividing the area of one hectare (10000 meters) by the ma (10000/ma) gives number of trees per hectare. The densities can be calculated by species using the same formulae.

DIAGRAM ILLUSTRATING USE OF THE ZIG ZAG METHOD

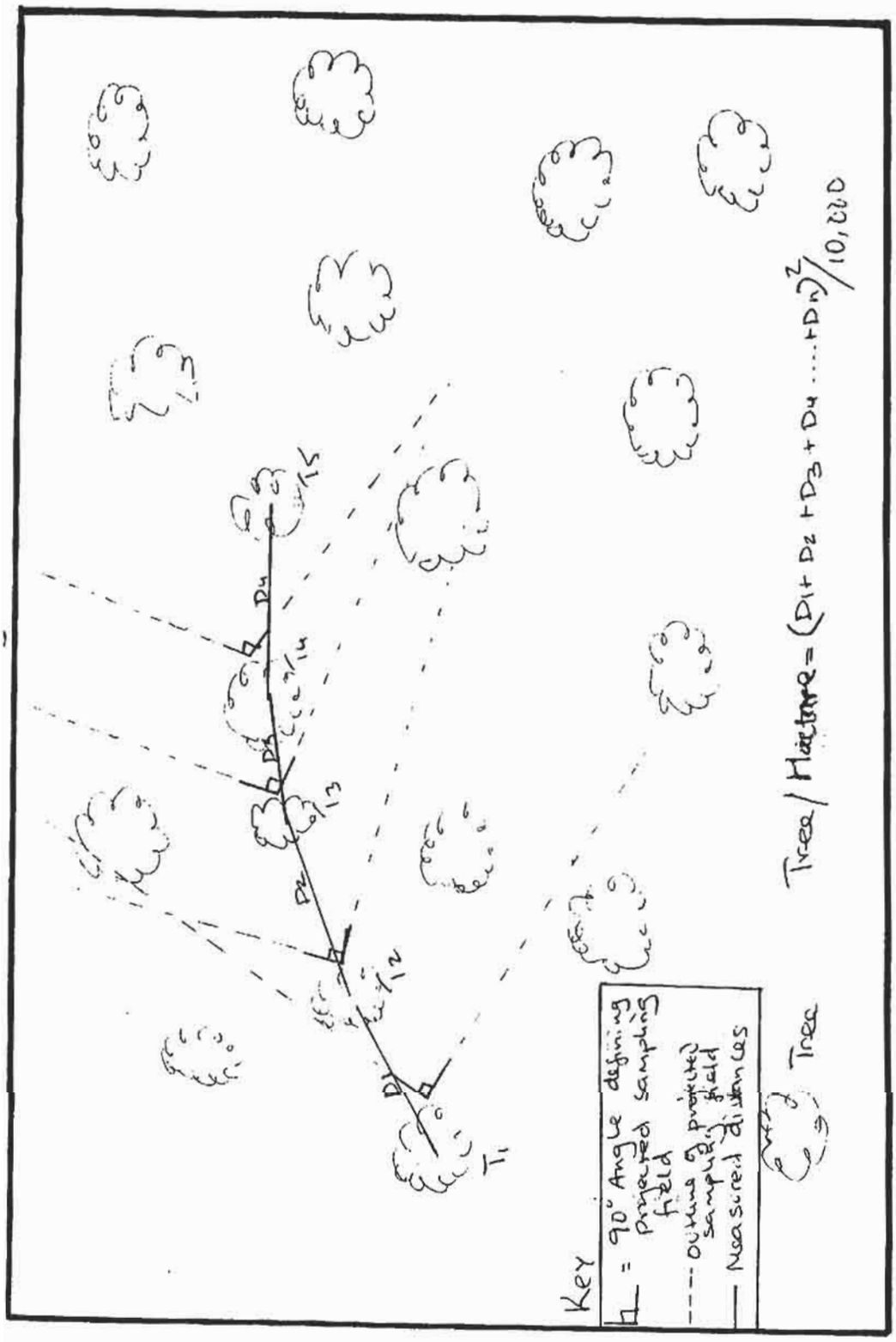
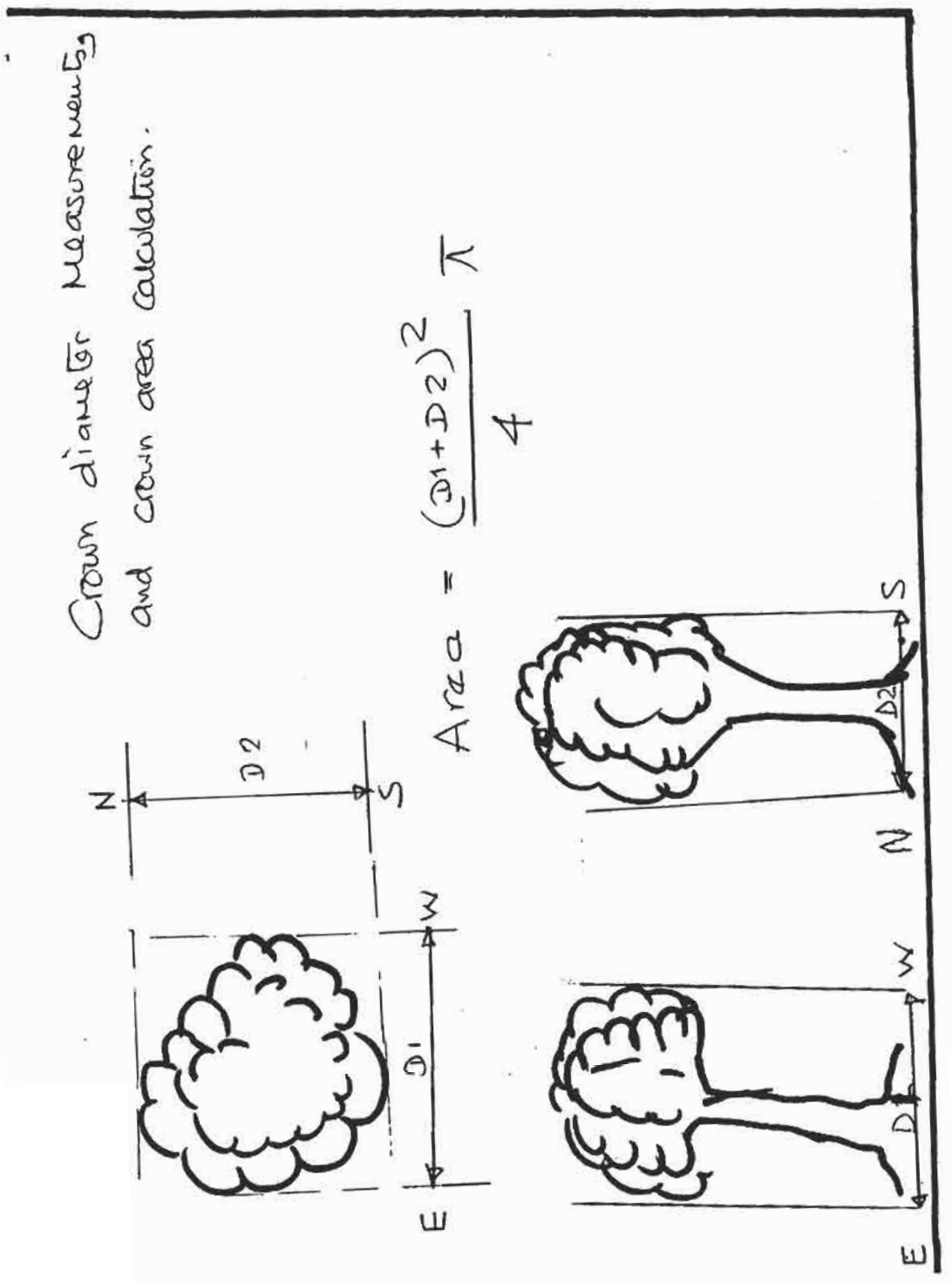


DIAGRAM ILLUSTRATING CROWN DIAMETER MEASUREMENT



Population structure is determined by categorising the data into height, crown diameter or basal diameter measurements into classes or categories, and counting how many individuals fall within each category. Plotting the categories against the numbers in each category gives a picture of the structure.

Population structure sample analysis Form

Date.....

Name of area.....

Transect Number.....

Name of data analyst.....

Species (A. senegal)	Category (Height classes in meters)	Number in category

All data collection forms should have a date and the name of the data collector. Data obtained from the various measurement should be summarised in the following form.

Sample Transect Data Summary form

Date.....

Name of area.....

Transect Number.....

Name of data enumerator.....

	cover	density	primary productivity	structure (good/bad)	range condition
General					
species A					
species B					
species C					
species N					

After several seasons/years of data collection, the data should be summarised to show the trends, as follows:

Sample Transect Data Summary form

Date.....

Name of area.....

Transect Number.....

Name of data enumerator.....

Species name.....

	cover	density	primary productivity	structure (good/bad)	range condition
Year/season 1					
Year/season 2					
Year/season 3					
Year/season 4					
Year/season n					

TOOL 13 SYSTEMATIC ANALYSIS OF EXPERIENCE (SANE)

Systematic Analysis Of Experience (SANE) is a simple procedure which can be used to enhance learning from information gathered during the process of monitoring and evaluation.

Procedure

IUCN (1997) suggested that a SANE session is best organised as a periodic workshop attended by the staff of the institution/projectand other relevant stakeholders. The objectives of such a workshop would be:

i. To learn from experience - both successes and failures - by relating it to the project's institution's objectives, hypotheses, and standard operating procedures;

ii. To foster reflection within projects and institutions:

iii. To improve project reporting, making it more meaningful for the project staff, funding agencies and other related institutions and projects;

iv. To facilitate a more meaningful exchange of experience-based learning within and between institutions and projects.

The procedure should be kept as a simple group activity organised in the following way.

- **Telling the story:** A staff person is asked to relate the project/institutional experience in the form of a story, while a facilitator records it on a flip chart. Participants are encouraged to contribute, to refine, dispute, add to and delete from the story. This process should start a lively discussion and a process of experience sharing. By the end of this step the flip chart should record a consensus version of the story, recording information gaps and points of disagreement.
- **Identify the turning points:** In analysing the story it should be possible to find events or decisions that are considered turning points. Very often, these will be points where activities were initiated or dropped, methods modified, staff changed, etc.
- **Identify phases of experience:** The period between successive turning points may be called a phase. It is sometimes useful to name each phase according to its principal distinguishing feature.
- **Phase analysis:** An analysis of the main issues must be carried out for each phase. The selection of issues will depend on the project/institution, but a general list to begin with might include: objectives, hypothesis, activities, methods, tools, and gaps. Some aspects to be analysed within these issues are actors, participation, type and frequency of use of methods and tools, successes and failures.
- **Analysis:** This step begins with a comparison of phases to identify the changes and the causes and consequences of the changes. It then proceeds to identify trends and to highlight those which mark the evolution of ideas and hypotheses.
- **Lessons learned:** from the above analysis it is easy to extract a synthesis of lessons learned in terms of what can be done and what should be avoided.
- **Communication:** The details of the process, the analysis, and the lessons learned should be recorded candidly and circulated to the project/institution staff, donors, partners and other institutions/projects that might benefit from the learning.

TOOL 14 THE GENDER ANALYSIS MATRIX (GAM)

Men and women have different access to and control over resources and this affects their ability to participate in and benefit from projects equitably - taking into account their various inputs. It is clear that in many parts of the world, women do not control their own labour or income. Lack of control and access limits women's contribution to development. Women often have less access to education etc. and inequality prevails.

The key questions on benefits profile are:

1) What benefits do men and women obtain from their work?
2) Are these benefits commensurate with the input?
3) Who controls these benefits

Factors influencing Activity, Access and Control Profile

Control and Opportunities: These are factors influencing division of labour and gender related access and control of resources and benefits. This profile identifies factors that create different opportunities or constraints to men's and women's participation and benefits from projects. Such factors could be economic, socio-economic, income distribution, poverty and infrastructure among others. Questions include:-

- Are there any legal, economic, social, cultural or other factors that determine the gender differential access to and control of resources.-
- Which determining factors will be determined by the project, which factors will be enhanced by the project? What could be the hidden factor that may not be supportive to the project?

The Gender Analysis Matrix (GAM) has 3 components

1) Activity profile
2) Access and control profile
3) Impact analysis

Activity Analysis Matrix

This tool enables the collection and analysis of information on daily patterns of activities of community members, and to compare the daily routine patterns of different groups of people (for example women, men, old, employed, unemployed, educated, uneducated). If done at different times in the year it can give information on seasonal changes in these patterns.

This information helps identify time constraints (shortages)

The daily routine for an individual can be completed either through an interview, through direct observation, or both.

A hypothetical example of a completed matrix for women is shown below:

Activity																			
Milking																			
House cleaning																			
Breakfast																			
Gardening																			
Preparing lunch																			
Eat Lunch																			
Rest																			
Attend to animals																			
Firewood collection																			
Fetching water																			
Prepare supper																			
Wash children																			
Serving supper																			
Rest																			
	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
	a.m.					**Time**			p.m.										

Resource Analysis Matrix

This tool is designed to provide an understanding of:

- women's and men's access to and control over resources
- the difference between having access to a resource and having control over a resource

The matrix is constructed as below, using discussion with the community to identify the resources used and the patterns of usage.

RESOURCES:	BENEFITS:	USED BY:	CONTROLLED BY:
e.g. Firewood etc	e.g. Cooking	e.g. Women	e.g. Men (agroforestry) Government (Forest Reserve)

Impact Analysis Matrix

This tool is designed to help determine the different impact of development intervention on women and men. Analysis is done by a group within the community (including men and women, adopters/non adopters, during the planning stage, design stage and during implementation and monitoring.

Definitions for the matrix:

- Women
- Men
- Household - Women/men/youth/children residing together (including extended family)
- Community - the target community as a whole
- Labour - Changes in tasks, level of skill required and labour capacity (how many people, how much etc.)
- Time - changes in amount of time it takes to carry out a task associated with the project or project activities.
- Resources - Changes in access to resources (income, land, credit) and extent of control over resources.
- Cultural Factor - Changes in social aspects of participants lives

Example of an Impact Analysis matrix

Activity/Objective :. Zero grazing - to increase milk production, improved livestock/income, reduce pressure on the Park

	Labour	**Time**	**Resources**	**Culture**
Women	-ve, more feeding	-ve, more time spent on cattle	+ve, milk and income	-ve, confined at home -ve, less visiting time
Men			+ve, income, calf	
Household		+ve, youth don't take cattle to graze		
Community			+ve, better health	

ANNEX 5: FIELD TESTING OF THE PROPOSED LOCAL LEVEL MONITORING AND EVALUATION SYSTEM

Introduction

The TORs guiding this activity required that the proposed M&E system be tested in the field to demonstrate its workability.

However, the proposed system consists of components, each with a set of recommended tools. Each component can be implemented independent of the others. It is therefore impractical to test the system itself. It is more productive to test some of the tools recommended. The following is an account of the test of some of the tools in "Somaliland".

In July 1997, some of the tools of the proposed monitoring and evaluation system were tested in Haraf village, Hargeisa District, Galbeed Region, "Somaliland". The exercise was carried out by IUCN in collaboration with SwissGroup and Islamic Relief Committee. The actual planning and implementation of the exercise was done by Andrew Inglis and Veronica Muthui, Osman of the SwissGroup (Hargeisa), Sofia Jibril Younis and Mohammed Nur Sultan, participatory environmental planning facilitators employed by IUCN.

The following tools were tested:

Tool Number*	Tool Name :	System component
1	Resource and Priority issues Mapping	Component 1: Needs Assessment
2	Participatory stakeholder identification	Baseline data collection, step 1
3	The H form	Baseline data collection step 2
4	Converting reasons to indicators	Baseline data collection step 2

Preparation for the exercise

After literature review on monitoring and evaluation tools, several combinations of tools was drafted in Nairobi. Discussions were held with Mr. Print (Swissgroup) and Mr. Ricaldo (COOPI, Boroma), and arrangements for the visit to Hayayabo and Haraf villages were agreed on. Further consultations between Swissgroup and Islamic Relief Committee (IRC) took place in Hargeisa District leading to further planning of the activity. The team travelled to "Somaliland" in early July and tested the draft tools first in Hayayabo village, Boroma, and then in Haraf village, Hargeisa. The test in Boroma allowed revision of tools proposed and is not reported on here.

Following is an account of the tools tested with the results of the testing. The SwissGroup and IRC were incharge of the preparation phase of the exercise. They held discussions with local elders, who agreed to the meeting, two weeks before the day of the actual meeting. These discussions were revisited a day before the actual event.

Consequently, a meeting was held in Haraf village on 14th July 1997 starting at 0900 with 35 men and 17 women in attendance. About 10 more people joined the meeting at various times during the morning and some left due to household and business duties. The groups therefore changed their size and composition during the meeting. Overall, over 50 local people attended the meeting. The main purpose of the meeting was to test several of the tools proposed in the monitoring and evaluation system. Resource and Priority issues Mapping for Assessment, Participatory Stakeholder identification and the H form for community current situation assessment were tested in one meeting to collect information which was used to raise indicators.

Background on Haraf Village

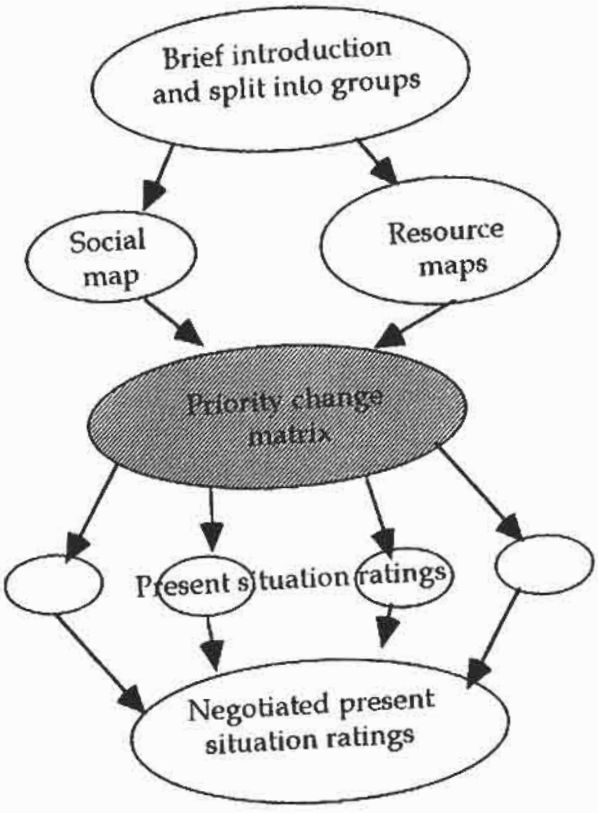
Haraf is a small village outside of Hargeisa District town in Northwest "Somaliland". Average rainfall for the area is 430 mm per annum with a potential evapo-transpiration of around 13,000 mm per annum (Caritas, 1997). The SwissGroup identified availability of water during the dry season and soil erosion caused by ineffective watershed management as major problems in the District. A water project aimed at developing local level water harvesting resources that exploit the available rainfall resources and conserve rainfall more efficiently from the wet period into the dry (Caritas, 1997) is currently being implemented by the group. The project also aims to relate water harvesting in the rural areas to improved watershed management.

The specific objectives, as stated in the SwissGroup/EU Project Agreement (Caritas, 1997) are:

- Increasing water security quantitatively in the rural Districts of Hargeisa District region;
- Elaborating and developing with (in terms of the rehabilitation of civil society) the local institutional and community framework;
- Ensuring that water quality at the rehabilitation sites are protected from pollution (and enteric water borne diseases);
- Injecting capital into the rural areas by investments through labor intensive projects and/or by providing assistance to agro-pastoral producers.

At the time of the exercise, SwissGroup was in the initial stages of discussions with the community of Haraf village regarding possible collaborative activities under the objectives.

The meeting followed the following process diagram.



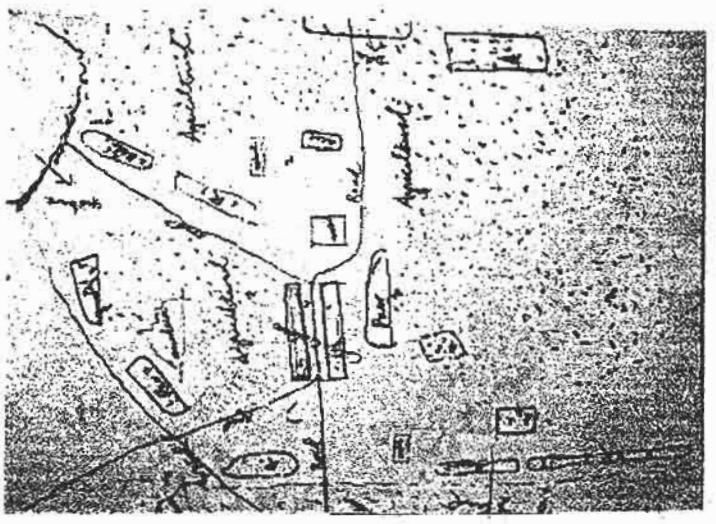
Besides gathering information using the tools under test, other objectives of the meeting were:

- to start to facilitate a process from which local peoples' ideas about their priority environmental changes can be shared with other local people, the facilitators, the SwissGroup, IRC and any other interested parties;
- to identify indicators regarding each of the priority changes;
- to identify ways to measure these indicators;
- to obtain an indication of the local groups or individuals who are taking decisions in specific areas and about specific aspects of local environmental management;
- to make the meeting enjoyable and stimulating for all concerned;
- to obtain as many visual recordings as possible of the meeting (i.e. outputs on large A1 paper and photographs/slides);
- to build good rapport with the people of Haraf; and,
- to be as neutral and objective as possible.

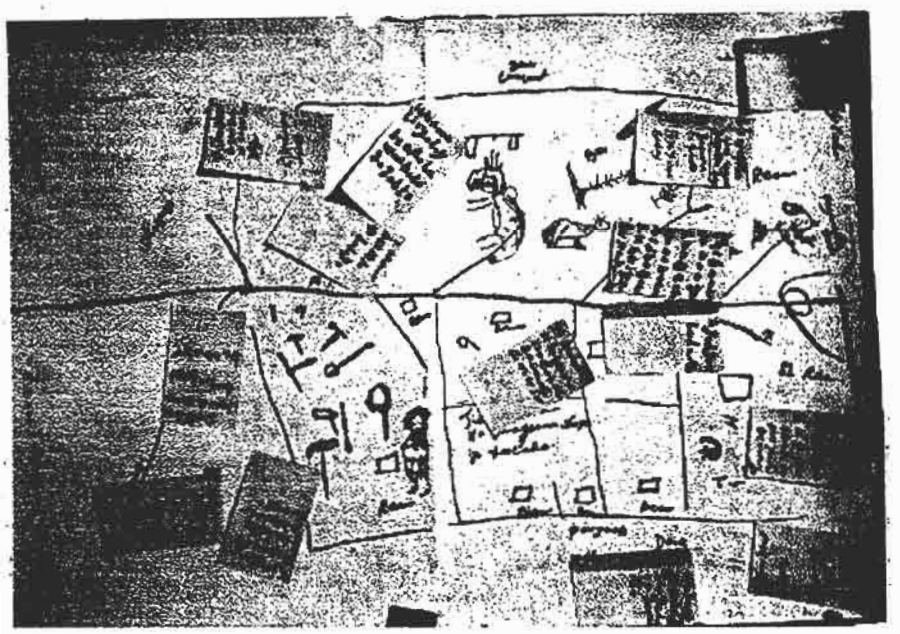
Tool: Resource and Priority issues Mapping (for assessment)

After a brief introduction by the facilitators, local people at the meeting were split into 2 groups, named "Maize" and "Sorghum". The "Maize" group were asked to concentrate, through producing a social map and a decision makers matrix, on local social and institutional arrangements. The Sorghum group were asked to illustrate the natural resource and land use situation by drawing maps.

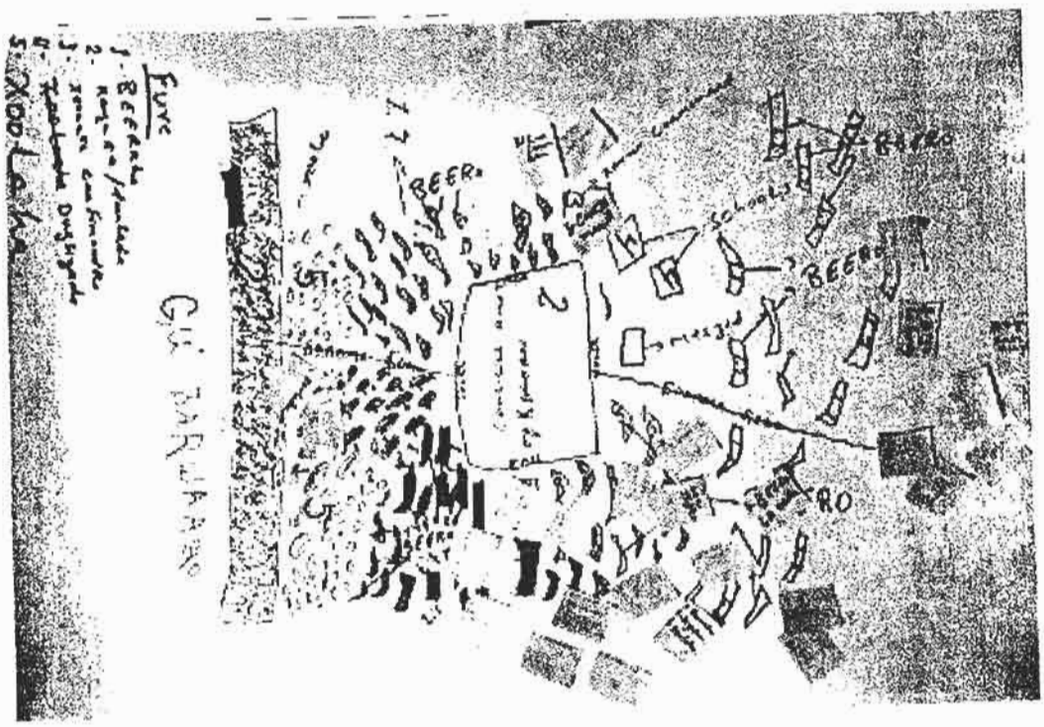
Map 1: Shows the village of Haraf and the surrounding area. Made by the "Maize" group, 13 persons (men, women and children ratio - 6:5:2)



Map 2. Shows the village and all resources of the area and the changes the women in the Sorghum group would like to see. Made by the "Sorghum" women's group (women and children ratio - 17:3)



Map 3. Shows the village and all resources of the area and the changes the men in the Sorghum group would like to see. Made by the "Sorghum" men's group (men and children ratio - 16:2)



Each person in the "Sorghum" group were then given three sticky notes on which to write which changes they would like to see to their local environment and put them onto their map. Some of the sticky notes were placed in the location where the person wanted the change to happen, others were put at random on the map (see Maps 2 & 3). The following is a summary of the desired changes written on the notes:

Priority	Men's Changes	Women's Changes
1	Agriculture x 7	Agriculture x 6
	Water x 8	Water x 1 Women's affairs x 4
2	Bunds in gully x 2	Bunds in gully x 4
		Roads x 2
		Women's education x 3
3	Education x 2	Education x 1
	Human health x 4	Human health x 1
	Agriculture x 1	Public latrine x 2

After explaining and discussing each others maps, desired changes and the institution matrix, both groups worked together with a meeting facilitator to fill in a priority change matrix, the headings of which had been pre-prepared by the facilitation team. The people at the meeting were asked to choose which change they would like to see happen first. The facilitator filled in the matrix as instructed by the people at the meeting. After completing a horizontal line, the people at the meeting were asked what change they would want to see happen next. The following table shows their priority changes and an analysis of them.

PRIORITY CHANGE	WHY	HOW	WHERE (map I)	WHO IS RESPONSIBLE
Agriculture	Water wells destroyed. Water level goes down in winter. Canals are cut by run-off Cultivated areas are destroyed by floods. Lack of tools.	Construct wells with concrete reams. Construct water catchment. Canalisation-. Control of gully erosion.	A Aa Ab Ac	1, 2 & 3 on the group matrix
2. Livestock	Health problem. Shortage of range area.	Regular medical supply. Provision of veterinary institution. Erosion control.	B	1,2,& 3
3. Poultry	It is useful	Provision of medical treatment drugs. To provide enough and regular food. To provide adequate home environment. Provision of training.	C	3
4. Human health	Various diseases affect the people of the community	Extension of the former health centre. Regular medical supplies. Provision of training.	D	3
5. Education	Illiteracy exists.	Construction or extension of former school.	E	1 & 2
6. Water	Shortage of potable water.	Construction or digging of cemented wells with cover slabs. Construction of berkeds.	F Ff	4

After the above six changes had been selected and analysed using the matrix (questions were also asked about how to measure changes in these), those at the meeting declared that they had covered all their priority areas.

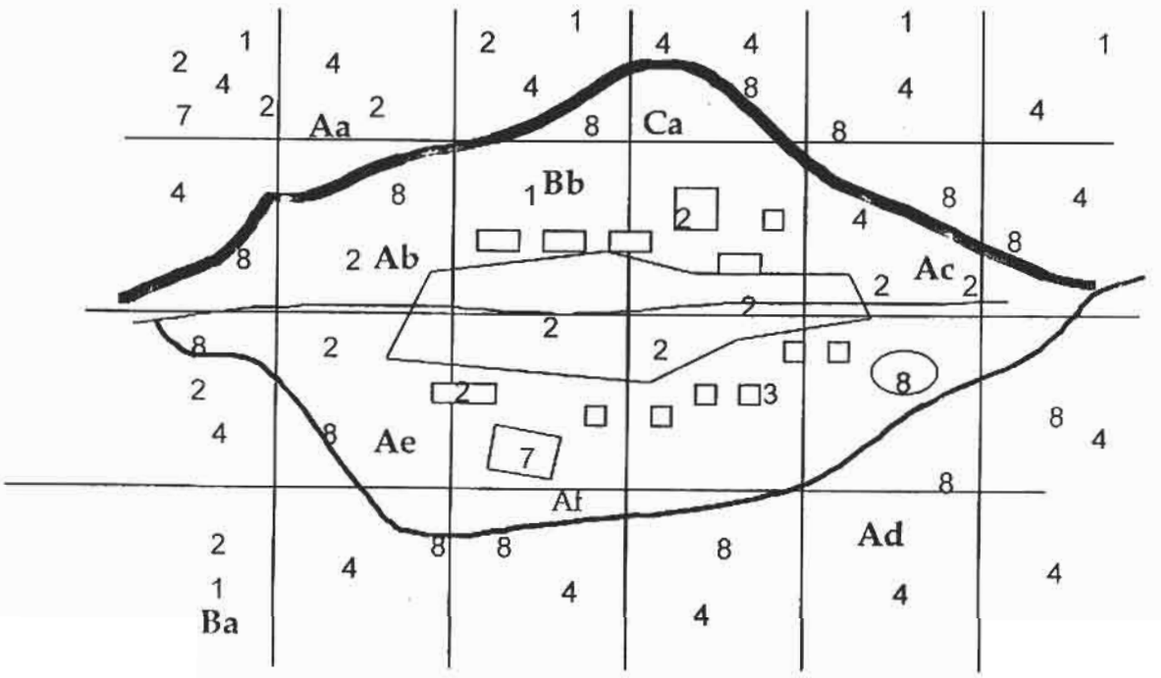
Participatory identification of stakeholders. (Local decision makers matrix)

Following the procedure laid out in the text description of this tool, the group drawing a local resources map was asked to identify and cross-link with the resources map, local institutions and individuals responsible for areas and resources, who should be part of a monitoring and evaluation exercise. The result was a local decision makers matrix shown below.

Table of local decision makers as identified in a group meeting in Haraf.

REF. NO.	LOCAL INSTITUTION	ITS RESPONSIBILITIES	MEMBERSHIP
1	Village council	General	17
2	Development committee		
3	Agriculture and water committee	Community economic development	
4	Health committee	Health affairs	
5	Women's committee	Women's concerns	

Resource Map of Haraf showing groups responsible for different areas.



COMMUNITY CURRENT SITUATION ASSESSMENT. (THE H FORM FOR)

The people were then spilt into four groups. For each of the six priority change topics. the people then rated their present situation with regard to the worst and ideal situations and marked this on a line with a scale of 1 to 10. They were then asked their reasons for giving the scores, and these were noted by the group facilitator and/or a participant. The results were collated in the following table.

PRIORITY	REASONS GIVEN FOR RATINGS AND MATRIX OUTCOMES	
Agriculture	• Shortage of water during droughts • Lack of agricultural tools • Shallow wells are not fit • Water erosion problems are many in rain-fed farms of the village • Insect problems of the vegetables • What is grown is harvested • Our life is agriculture • Water is available • Shallow wells are not well dug • Half of the shallow wells are destroyed or collapsed • Bunds • The agricultural inputs provided (M)	• Some are normal • River bed and stream water not controlled • Bad seed quality • Lack of water pipes • Lack of water pumps • Lack of transport for collecting natural fertilisers (manure) • Lack of agro-chemicals (for insects) • Level of community effort • Discussions and respect for the community public programmes • Community cooperate and support each other • Will of the community (M)
Animal health	• Animal diseases • Animal diseases with no drugs • Ticks are many • Weak animals • Diseases are not prevalent • Reproduction is good • Fresh gully grasses are grazed • Ticks are limited • Life is good • Change comes on the social life of the community in every aspect.(M)	• Low level of animal health • Overgrazed pasture lands (increased) • Distance of water points • Lack of animal drugs • Lack of animal health care post • Lack of veterinarian • Having no training • Lack of grazing areas • Increase of livestock numbers.(M) • Improvement in livestock quality.(M)

Poultry	• Poultry health problems • Lack of food • Lack of shelter (poultry houses) • Lack of drugs • No trained workers (labourers?) for poultry farming. • Some people have some poultry, while most of them have nothing • Their quality improvement.(M)	• Difficult how to conduct • Wild animals eat mostly • Ignorance re. poultry farming • Poultry farming diseases • The impact they make on the community life.(M) • Lack of incubator • Increase of their reproduction. (M)
Human health	• Lack of medicine • Lack of doctors • Lack of community health workers • Lack of training to small nurse staff • Lack of health post • Lack of M.C.H. in the village • Lack of training • Decrease of children death rate.(M) • Improvement of women's health.(M)	• Lack of health facilities • Community health workers earn no money in the meantime • Scarcity of health staff • Diseases • Transmitted diseases • Patients taken to Hargeisa • Increase/decrease of common diseases (M)
Education	• Schools are severely damaged by rains • Schools are very good • Decrease of the number of teachers • Negligence of the Ministry of Education to this village • Economical problems for the teachers Educational level attained by the community.(M)	• Lack of school • Schools are not rehabilitated • School was destroyed • Lack of education facilities • Small incentive given to teachers • No teaching going on • Increase of reading and writing ability. (M) • Good/bad moral felt from students.(M)

Drinking water	• The number of bad cement reservoirs • The number of bad earth water reservoirs • Shallow wells are not well dug • Shortage of water runoff in the river bed • Shallow wells are short • Shortage of water stream this year • Some wells are dug. others are collapsed • Shortage of shallow wells • Water goes down during crisis • Increase or decrease of water-borne diseases. (M) • The time and money saved for the community (M)	• Clear water shortage to the village community • Water distant to some of the village communities • Wells require cover-slab??? • One well is working correctly • One well has cover-slab • One well is permanent • The number of bad wells • Lack of cement and earth water reservoirs • Distance to permanent water points is shortened. (M) • The extra time to do other work. (M) • Minimisation of water fetching burdens (M)

These reasons then helped to inform the discussion in which the people agreed on group rating. The groups then came together again. For each priority change the scores agreed to by the group were displayed (see "x"s on diagram below) and a final community rating was negotiated and agreed upon:

After a vote of thanks from the facilitators to the people who had participated in the meeting, the head Elder thanked the facilitators for the meeting. One of the elders then travelled with the team to assist with pointing out prominent fixed features in the area (see below) and locating the GPS reading sites on the Map 1.

CONVERTING REASONS TO INDICATORS

Back in the office, the IUCN team analysed both matrices of "priority changes" and "reasons for ratings". Using the procedure laid down in text description of "converting reasons to indicators', they first selected quality reasons and then converted them into indicators (see tables below). Those reasons which were deemed to be specific, relevant, measurable, timely in terms of being useful for monitoring and feasible (in terms of resources require to measure) were shortlisted as possible indicators. Possible tools (both participatory and non-participatory)that could be used to measure change in the reasons given were listed:

Shortlisted indicators with M&E methodologies

AGRICULTURE

REASONS FOR RATINGS	CRITERIA FOR SHORTLISTING REASONS	PARTICIPATORY TOOLS	NON-PARTICIPATORY TOOLS
The agricultural inputs provided (M)	SRMT	xxx	
will of the community (M)	xxx		
Shortage of water during droughts (Jilal)	SRMTF	Mapping, seasonal calendar, SSI	inventory of water harvesting and storage facilities, met data
Lack of agricultural tools	SRMTF	Farming activity/tool diagram, pie chart	inventory of tools available to farmers and shops
Shallow wells are not fit Shallow wells are not well dug Half of the shallow wells are destroyed or collapsed Water is available	SRMTF	mapping	technical inventory of shallow wells
Water erosion problems are many in rain-fed farms of the village	SRMTF	mapping (farm and village)	calibrated sticks
Insect problems of the vegetables Lack of agro-chemicals(for insects)	SRMTF	Plant/insect/remedy matrix, mapping (farm and village)	entomological surveys
What is grown is harvested	SRMTF	diagrams, farm mapping, flow diagrams	observation
Our life is agriculture	S		
Bunds	SRMTF	mapping	inventory
River bed and stream water not controlled(incidence of flooding)	SRMTF	seasonal calendar, mapping	observations
Bad seed quality	SRMTF	matrices, farm maps	yield measurements, observations
Lack of water pipes Lack of water pumps	SRMTF	mapping	inventory
Lack of transport for collecting natural fertilisers (manure)	SRMTF	social mapping, mobility map, SSI	inventory
Level of community effort Discussions and respect for the community public programmes Community cooperate and support each other	SRMTF	Timeline of meetings, community events	Records and minutes of community meetings, records of money raised for community programmes

ANIMAL HEALTH

Reasons for ratings	Criteria for shortlisting reasons	Participatory tools	Non-participatory tools
Increase of livestock numbers.(M)	S		
Improvement in livestock quality.(M)	xxx		
Change comes on the social life of the community in every aspect.(M)	xxx		
Ticks are many Ticks are limited	SRMTF	animal body mapping, historical trend diagram, ratings, SSI, trends of TBD	surveys, observations, records of TBDs
Weak animals (vs. strong ones)	SRMTF	SSI, diagrams	record keeping
Reproduction is good	SRMTF	diagrams	record keeping
Fresh gully grasses are grazed	SRMTF	mapping, seasonal calendars, transect	observation, surveys
Life is good	xxx		
Overgrazed pasture lands (increased)	SRMTF	mapping of grazing areas, historical trends for each area, transect	range surveys, quadrats, range condition trend analysis
Distance of water points	SRMTF	mapping	surveys and official maps, inventory
Lack of animal health care post Lack of veterinarian	SRMTF	mapping	observation
Having no training	SRMTF	SSI, timeline, social map	inventory of trained people, training reports
Lack of grazing areas	SRMTF	resource and mobility mapping, seasonal calendars, transect	surveys, transects

HUMAN HEALTH

Reasons for ratings	Criteria for shortlisting reasons	Participatory tools	Non-participatory tools
Increase/decrease of common diseases (M) Diseases (prevalence)	SRMTF	social maps, trend diagrams, ratings	records, surveys
Decrease of children death rate.(M)	SRMTF	trend diagrams	records
Improvement of women's health.(M)	xxx		
Lack of medicine	SRMTF	body mapping, disease/remedy matrix	market source surveys, govt/NGO/project records
Lack of doctors	SRMTF	mapping	observation, govt/NGO/project records
Lack of community health workers	SRMTF	mapping	observation, records
Lack of training to small nurse staff Lack of training	SRMTF	SSI, timelines	records, inventory of trained people, training reports
Lack of health post	SRMTF	mapping	observation, records
Lack of M.C.H. in the village	SRMTF	mapping	observation, records
Lack of health facilities	xxx		
Community health workers earn no money in the meantime	SRMTF	social maps, SSI, livelihood analysis diagrams	govt/NGO records
Scarcity of health staff	xxx		
Transmitted diseases		body mapping, social mapping, SSI	records (NGO/govt), sampling surveys
Patients taken to Hargeisa	SRMTF	timeline, disease/remedy matrix, body mapping	hospital records, sample surveys

EDUCATION

Reasons for ratings	Criteria for shortlisting reasons	Participatory tools	Non-participatory tools
Schools are severely damaged by rains Schools are not rehabilitated School was destroyed (schools state of repair)	SRMTF	Mapping	Photography, observation, records
Schools are very good	xxx		
Decrease of the number of teachers	SRMTF	Timeline, SSI	Government records
Negligence of the Ministry of Education to this village	SRMTF	Venn diagram SSI	Government records
Economical problems for the teachers	SRMT	xxx	
Lack of school	SRMTF	Mapping	Government records
Increase of reading and writing ability. (M)	SRM		
Good/bad moral felt from students.(M)	xxx		
Lack of education facilities	SRMTF	Mapping	Government/ NGO records
Small incentive given to teachers	SRMTF	SSI	Government/ NGO records
No teaching going on	SRMTF	SSI	Observations and records
Educational level attained by the community.(M)	xxx		

The shortlisted reasons were turned into indicators as follows;

Issue	Indicators	Participatory tools	Non-participatory tools.
Human Health	Incidence of common diseases	Social map, trend lines	Records kept, surveys, hospital records
	Child death rates	Trend lines, semi-structured interviews (SSI)	Records
	Availability of medicines	Body mapping, Diseases/remedies matrix	Market source surveys, government/NGO records

	Availability of doctors	mapping, SSI	Observation
	Availability of community health workers	mapping, SSI	Observation
	Availability of nurses training facilities	Timelines, SSI	Inventory of training institutions, records, observations
	Availability of Health posts	Mapping	Observations, records
	Availability of mother and child health services	Mapping, SSI	Observations, records
	level of earnings for community health workers	Social map, SSI, livelihood analysis diagrams	Government/NGO payment records
	level of disease transmission	Body mapping, social mapping, SSI	Sampling surveys, government/NGO records
	Number of patients being to Hargeisa District hospital	Timelines, Disease/remedy matrix	Sample surveys, hospital records
Potable water	Wells with cover slab	Mapping, transect	Observation, records, inventory
	Incidents of water borne diseases	social health mapping, SSI, Trend diagrams	Hospital records, drug sales records
	No. of fully functional wells	mapping, transect	Inventory records, observation
	Distance from village to permanent water points	mapping, seasonal calendars	Inventory, questionnaire surveys
	No. of earth/cement water reservoirs in the village	Mapping	Inventory, records observations
	Number of permanent well in the village	Mapping	Inventory, records observations
	Quality of water from earth/cement reservoirs	Mapping, transect	Water quality testing, inventory, observations
	Number of shallow wells	Mapping	Inventory, records
Agriculture	Availability of water for irrigation during the dry season	Mapping, seasonal calendar, SSI	Inventory of water harvesting and storage facilities and meteorological data
	Availability of agricultural tools	Activity diagrams (pie charts)	Inventory of tools available in shops and with farmers
	Number of shallow irrigation wells in disrepair	Mapping	Technical inventory of shallow wells functioning at full capacity
	Extent of erosion on rainfed farms	mapping farmland and village	Calibrated sticks

	Extent of insect pests attack on vegetables	Plant/insect matrix, mapping farm and village	Entomological surveys
	Proportion of planted crop harvested	Pie diagrams, farm mapping	Sample productivity surveys
	Number of functional erosion bunds	mapping	inventory
	Incidents of flooding	Seasonal calendar and mapping	Observations, records
	Seed quality	Matrices, farm maps	Yield measurements, observations
	Level of water transport infrastructure (water pumps and pipes)	Mapping	Inventory
	Level of fertiliser and manure transporting infrastructure	Mapping, mobility map, SSI	Inventory
	Level of community effort, intent and support; re public programmes	Timeline of meetings, community events	Records and minutes of community meetings, money raised for community programmes
Animal Health	Change in livestock numbers	Livestock numbers historical trend lines, social mapping, trend diagrams	Census
	Availability of veterinary drugs	Diseases/remedies matrix	Market source surveys, government/NGO records
	Tick prevalence	Animal mapping, historical trend diagrams, SSI,	Sample surveys, observations, records of incidences of tick borne diseases
	Ratio of weak to strong animals	SSI, Diagrams	Surveys and observations, record keeping
	Prevalence of diseases	Seasonal bar graph	Record keeping
	Level of reproduction	Diagrams	Record keeping
	Availability of fresh gulley grazing areas	mapping, seasonal diagrams, participatory transect	Observation, surveys
	Condition of pasture	Mapping of grazing areas, historical trend lines, participatory transect	Range condition surveys and trend analysis, range inventory, quadrats,
	Distance to water points	Mapping	Observations, inventory
	Availability of veterinary doctors	Mapping	Observation, survey of veterinary doctors
	Level of training in	SSI, timelines, social	Inventory of trained

	animal husbandry	map	livestock owners. training reports
	Amount of grazing areas available	Resource and mobility mapping. seasonal diagrams. participatory transect	Rangeland surveys, inventories. transect
Issue	Indicators	Participatory tools	Non-participatorytools
Poultry	Level of reproduction	Graphs. chicken mapping	Records
	Quality of chicken	Matrix. ratings	Records. market research surveys
	Incidents of poultry health problems	Chicken body mapping. diseases/remedies matrix, graphs and diagrams	Surveys. records and observations
	Availability of poultry feed	SSI, pie-charts. flow diagrams. ratings	Market source surveys. chicken feed sales records
	Poultry houses	Mapping, transect	Observations. inventory
	Availability of poultry veterinary drugs	Disease/remedy matrix, SSI. ratings	Market source surveys. records
	Availability of an incubator	Mapping	Records. observations
	Number of people rearing poultry	mapping	Sampling surveys. records
	Level of awareness on poultry husbandry	Ratings. SSI	Training records. questionnaire survey on level of awareness related issues
Education	State of school's repair	Mapping	Photographs. observations. records
	Number of teachers in the schools	Timelines. SSI	Government/NGO records
	Level of support from parent ministry	Venn diagrams. SSI	Government records
	Number of schools	Mapping	Government records. observations. inventory
	Level of educational facilities available	Mapping, SSI	Government/NGO/Village committee records
	Teachers better paid	SSI	Inventories. government/NGOs financial records
	Level of teaching actually going on in schools	SSI	Observations. teaching sample surveys. teachers records

CALCULATING WELL-BEING (Barometer of Well-being)

Using the procedure laid out in the text description of these tools, the issues were categorised as follows.

PRIORITY CHANGE
Agriculture
Animal health
Poultry
Human health
Education
Water

- community negotiated ratings discussed were added to the table.

Issue	Rating
Agriculture	3
Animal health	2
Poultry*	0
Human health	4
Education	4
Water*	3

- Each issue identified in the priority change matrix was classified as either biophysical (ecosystem) or socio (human system).

All Issue Table for Haraf village

Issue	System	Rating
Agriculture	Ecosystem	3
Animal health	Ecosystem	2
Poultry*	Ecosystem	0
Human health	Human	4
Education	Human	4
Water*	Human/Ecosystem	3

NB. In some cases poultry may refer directly to wealth and therefore be classified as human. Water here referred to both potable water and water for irrigation, hence classified as both.

- Two new tables from the all issue table were made (see below).

Socio-economic (human) system issues

Issue	priority number	rating
Human health	1	4
Education	2	4
Water	3	3

Biophysical (ecosystem) system issues

Issue	Priority number	Rating
Agriculture	1	3
Animal health	2	2
Poultry*	3	0
Water	4	3

Calculating Well-being using priority number as a weighting factor.

The number of issues in each table were counted. Since the ranking in the table is based on prioritisation by the community at the generation stage, the first issue on each table assumes the highest ranking, the second issue the second rank, etc. The socio-economic has 3 issues, therefore the highest ranked, human health in this case, has three. See table below.

Socio-economic (human) system issues

Issue	priority number	rating	weighting factor
Human health	1	4	3
Education	2	4	2
Water	3	3	1

The well-being for the socio-economic system was calculated as follows:

$(4x3) + (2x4) + (1x1) / (3+2+1) = 21/6 = 3.5$

Similarly, to calculate the well-being of the ecosystem, a table with weighting factors was made as follows.

Biophysical (ecosystem) system issues

Issue	Priority number	Rating	Weighting factor
Agriculture	1	3	4
Animal health	2	2	3
Poultry*	3	0	2
Water	4	3	1

The well-being for the ecosystem was calculated as follows:

$(3x4) + (2x3) + (0x2) + (3x1) / (4+3+2+1) = 21/10 = 2.1.$

Draw a barometer of well-being

Annex 6: A Sample of Ecological issues of monitoring and evaluation

Some specific ecological issues for M&E include:

1. Monitoring impacts of water development on rangelands

Rationale.

Water development in rangelands is usually associated with increased sedentarisation of otherwise nomadic populations and livestock. Areas of permanent water have been observed to be degraded, and require constant monitoring and evaluation. It is therefore recommended that vegetation monitoring from the water points and settlements be carried out using transects running from the water points and/or settlements outwards. Ground cover, primary productivity, density and population structure are important indicators that can be easily measured by project staff.

2. Monitoring effects of agriculture on the environment

Rationale

By converting natural vegetation into cultivated land, agriculture is likely to have an impact on the biodiversity by clearing native climax vegetation, replacing it with non-native species or even weeds. Vegetation is the habitat for many animal species, such as mammals and rodents, birds and insects etc. When the vegetation is cleared, such habitats are destroyed, and there is likely to be a decline in numbers of the resident species. Monitoring numbers and condition of wild species (fauna) is both difficult and time consuming and can be inferred through the results of vegetation monitoring.

Clearing vegetation may accelerate soil erosion, if soil conservation measures are put in place. Somalia is underlain by a marine sediment. Like other such areas, it has native vegetation adapted to keeping water from reaching this marine sediment. Clearing the native vegetation may interfere with water movements in the soil, permitting rain and/or surface water to penetrate to the marine sediment. Bad irrigation, where the soil is kept wet for long periods has the same effect. Once surface water has reached the marine sediment, salt comes up by the process of osmosis, increasing the soil salinity. In poorly drained irrigation systems, this salt accumulates in the soil and is often washed down into the rivers by run-off. It is important therefore to monitor soil and water salinity both in irrigation schemes and on rainfed farms.

3. Monitoring effect of grazing and browsing on range condition.

Rationale

Livestock production is the mainstay of Somalia economy, with a large portion of the population depending on the system. Livestock production is largely dependent on the rangelands, with limited zero grazing being practised in the peri-urban areas. Traditionally, livestock production was through nomadic pastoralism. Nomadic pastoralists have experienced pressure to abandon the nomadic way of life and settle down from various forces including civil wars, "development" etc. There is evidence of nomads settling down and parts of common land being fenced off in the North West. Rangelands are fragile ecosystems whose condition can deteriorate quite fast if inappropriately used. It is therefore important to monitor trends in range condition throughout the rangelands, but especially on settled rangelands.

4. Monitoring effects of infrastructure on the environment

Rationale

Roads, railways, airports, etc. open up areas for trade and habitation. Trading centres and settlements often spring up on the rail and roadsides. Human settlement is accompanied by sedentarisation of some livestock on which people depend for milk, meat etc. The settling population requires materials to build houses and firewood for cooking, warming etc. The combined effect of people and their livestock settled in one area could be localised land degradation, as seen near refugee camps. It is therefore important to monitor trends in natural resources along settlements related to infrastructure development.