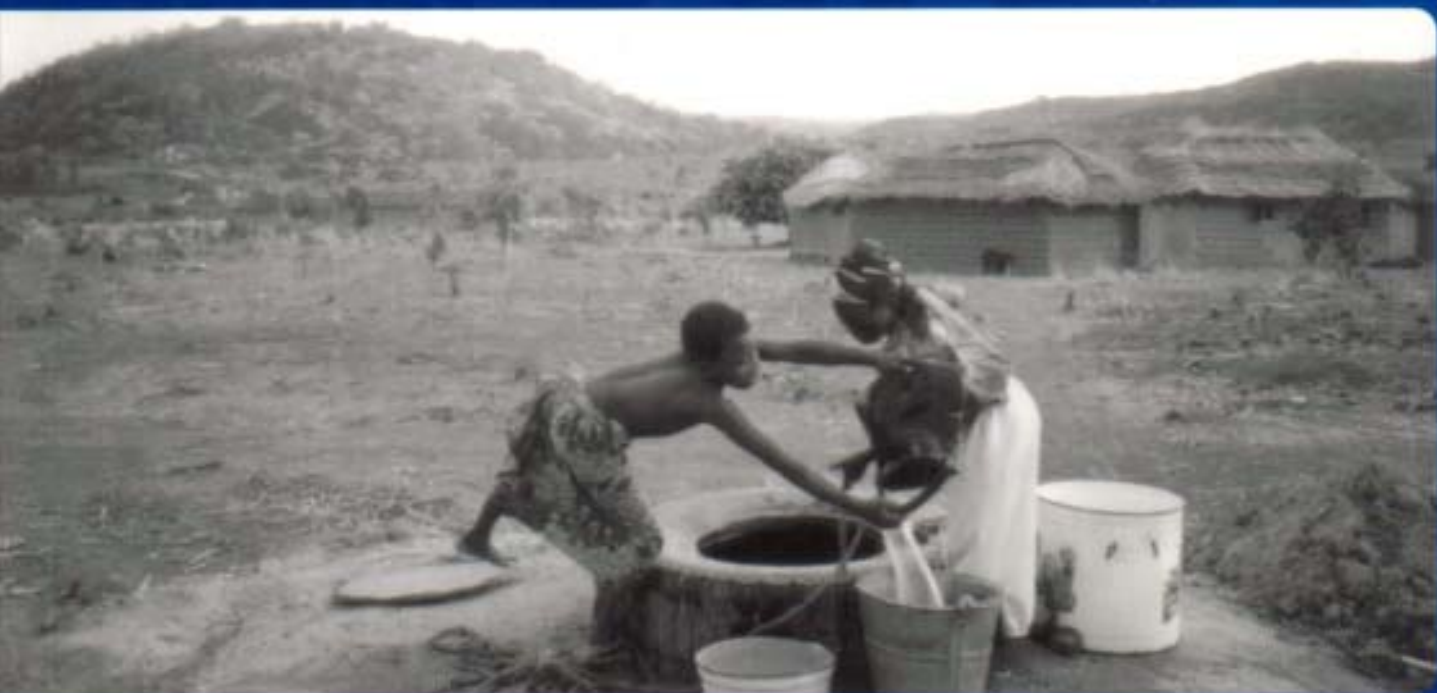


# Management Guide

Urs Fröhlich



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### ***Context***

Access to adequate water, sanitation, drainage and solid waste disposal are four inter-related basic needs which impact significantly on socio-economic development and quality of life. The number of people around the world who still do not have access to these basic facilities, despite enormous global effort over more than two decades, provides sufficient evidence that conventional approaches and solutions alone are unable to make a sufficient dent in the service backlog which still exists. Numerous initiatives are ongoing at different levels to improve strategies, technologies, institutional arrangements, socio-cultural anchorage, and cost effectiveness, all to enhance efficiency and, eventually, to have an impact on the sector's goals. In addition, the ever-increasing scarcity of water brings policymakers together to find solutions to the challenge of water resource management. This series of manuals is intended as a contribution to these efforts.

### ***Background***

The decision to produce this series of manuals was prompted by the positive experience gained with a practical manual based on the experience of Helvetas (a Swiss NGO) during the 1970s in Cameroon, which has become outdated with the passage of time. SDC (the Swiss Agency for Development and Co-operation) supported SKAT's initiative to produce this series, working with professionals with longstanding practical experience in the implementation of rural water supply projects. Lessons learnt during the workshops held by AGUASAN (an interdisciplinary working group of water and sanitation professionals from Swiss development and research organisations) over the last 14 years have been included where appropriate. In particular, there is an emphasis on documenting and illustrating practical experiences from all regions of the world.

### ***The Manuals***

As can be seen from the table on the back cover, this series of manuals is primarily aimed at project managers, engineers and technicians. However, given the wide range of subjects covered, it is also an important working tool for all actors in the sector, ranging from those involved with policy development to those constructing systems at village level. The series has a clear focus on water supply in rural settings. It proposes technologies with due consideration for socio-cultural, economic, institutional and regulatory requirements. This approach is in keeping with the SDC water and sanitation policy, emphasising the balanced development approach leading to sustainable programmes and projects.

It should be noted that the present series deals almost exclusively with water supply. The importance of sanitation is however clearly established in Volume 1, which deals predominantly with the software aspects necessary to achieve an impact. It includes some proposals for optional tools, approaches and institutional arrangements and is intended as an overall introduction to the other, more technical, volumes of the series.

### ***Some final comments***

The water and sanitation sector is constantly evolving. We would welcome any queries, comments or suggestions you might have. Your feedback will be made available to other interested users of the manuals.

Finally, we hope that these manuals will be useful for the practitioner in the field as well as for the planner in the office. If the series can be a contribution to providing water to more people in need on a sustainable basis, we will have achieved our goal.

The production of this series has only been possible through the continuous support of colleagues from all over the world. Our sincere thanks to all of them.

Armon Hartmann  
Head of Water & Infrastructure Division  
Swiss Agency for Development Co-operation

Karl Wehrle  
Head of Water & Construction Division  
SKAT

Fresh water is a finite resource, essential to sustain life, development and the environment. In many parts of the world, the collection of water for drinking and sanitation purposes is a heavy burden on people, especially on women. Too little or too much water, that is floods and droughts –are major drawbacks to the development and prosperity of human society.

Interdisciplinary, inter-sectoral and inter-institutional co-operation, and the full participation of all stakeholders, are essential elements in any strategy designed to improve the access to, and reduce the scarcity of, fresh water. Governments wishing to give up their role as the providers of water facilities should still retain the vital tasks of facilitating and co-ordinating the legal, territorial and administrative aspects of water supply.

This manual, one in a series of technical manuals is intended to provide guidance in the non-technical tasks of management in the field of water supply and sanitation projects. It contains three main parts:

### ***Part A: Fundamentals of Water and Sanitation Sector Management***

A guide on “How to read this Manual” is followed by a vision of sustainable development. Working from this vision, five fields of intervention and a set of management principles are derived.

### ***Part B: Project Development***

After the presentation of a typical project cycle, the various stakeholders are introduced and their involvement in the project is explained. As well as the need for sound project preparation, the need to consider and understand the national and local context is stressed. Full attention is given to the implications of operation and maintenance. The importance of ecological integration, including watershed management, is underlined, as well as the interdependencies of water-related activities, hygiene, sanitation and health.

### ***Part C: Methods and Tools for Project Management***

This Part presents a set of methods and tools to promote efficient and transparent planning, execution and operation of water projects. Participatory approaches are recommended in order to promote a sense of ownership among the stakeholders. The so-called MEPI-cycle (**M**onitoring, **E**valuation, **P**lanning, **I**mplementation) is explained. The chapters on human resource development and institution development are of special importance regarding the proposed processes of decentralised, community-based management and the author's conviction that modern knowledge/technologies should be integrated with traditional knowledge and local experience.

### ***Figures, tables and checklists***

These are used to facilitate the understanding of the text and to assist the use of presented methods and tools in a particular project. Some of the appendices contain specific examples, while others refer to other sources of information.

### ***Acknowledgements***

This manual would not have been born without the constructive support of Karl Wehrle, Stephan Niederer and many other friends and colleagues. A special thanks goes to my wife, Annagreth, who tolerated my working even during evenings and weekends. Also Sabine Losenegger, who typed the manuscript, Theres Raimann and Martin Läng, who contributed the drawings and Seamus Collins, who did the proof reading earn my sincere appreciation. It is my hope that this management manual will help its users to successfully implement appropriate and sustainable water supply and sanitation projects.

Urs Fröhlich  
May 2001

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<b><i>Part A: Fundamentals of Water and Sanitation Sector Management</i></b>	<b><i>3</i></b>
1. Introduction .....	3
2. Vision of sustainable development .....	5
3. Main fields of intervention with regard to sustainability .....	12
4. Basics of project management .....	25
<hr/>	
<b><i>Part B: Project Development</i></b>	<b><i>33</i></b>
1. Project cycle and actors .....	33
2. Beyond the project – the national context .....	42
3. Project preparation .....	50
4. Project implementation .....	66
5. Project operation and maintenance .....	81
<hr/>	
<b><i>Part C: Methods and Tools for Project Management</i></b>	<b><i>99</i></b>
1. Making decisions .....	100
2. Water and sanitation knowledge system (WSKS) .....	104
3. Planning tools .....	106
4. Tools for implementation .....	120
5. Data and information management .....	124
6. Human resource and institutional development (HRD + ID) .....	141
7. Economic resource management .....	154
<hr/>	
<b><i>Appendices</i></b>	<b><i>163</i></b>

---

## TABLE OF CONTENTS PART A

### Part A: Fundamentals of Water and Sanitation Sector Management .....3

<b>1.</b>	<b>INTRODUCTION.....</b>	<b>3</b>
1.1	Rationale.....	3
	The challenge.....	3
	International commitment.....	3
1.2	Scope and intention of this manual.....	4
	Promotion of the recognised objectives of the water sector.....	4
	Main topics.....	4
1.3	How to read this manual.....	5
	Structure.....	5
	Cross-references.....	5
<b>2.</b>	<b>VISION OF SUSTAINABLE DEVELOPMENT.....</b>	<b>5</b>
2.1	The constraints.....	5
	From constraints to sustainable water and sanitation projects.....	5
2.2	Strategy for sustainable development.....	8
	Balanced development.....	8
	Project integration.....	8
	Ecological integration.....	10
2.3	A Sense of Ownership through Community Based Management.....	11
	Ten arguments in favour of community management.....	11
<b>3.</b>	<b>MAIN FIELDS OF INTERVENTION WITH REGARD TO SUSTAINABILITY ..</b>	<b>12</b>
3.1	Introduction.....	12
	Basic view; philosophy.....	12
	The five fields of intervention.....	13
3.2	The social environment.....	14
	Motivation and involvement of local groups.....	14
	Community based management.....	15
	Participative development co-operation.....	15
	Transfer of ownership.....	15
	Gender structures.....	16
	Social integration of projects.....	16
	Management of change and dynamism of co-operation.....	16
3.3	Institutional set-up.....	17
	Involvement of NGOs and the private sector.....	18
	Strengthening of institutions.....	18
	Institutional changes and flexibility.....	18
3.4	Economic conditions.....	19
	Tangible benefits.....	19
	Financial compatibility.....	19
	Willingness and ability to pay.....	20
	Cost recovery, appropriate pricing and financing models.....	20
	Credits and deposits.....	21
	Paid and unpaid work.....	21
	Easing of financing problems.....	22
3.5	Technology.....	22
	Choice of technology.....	22
	Linkage of technology to O+M.....	22
	Water quality and quantity.....	23
	Use of computers.....	23
	Technical standardisation.....	23

3.6	<i>Rules and knowledge</i> .....	24
	<i>Ability to solve problems</i> .....	24
	<i>Learning at all levels</i> .....	24
	<i>Exchange of experience within international networks</i> .....	24
4.	<b>BASICS OF PROJECT MANAGEMENT</b> .....	25
4.1	<i>Scope and definitions</i> .....	25
	<i>What is a project?</i> .....	25
	<i>What does project management mean?</i> .....	25
	<i>Systematic approach</i> .....	25
	<i>Integration</i> .....	25
	<i>Goal orientation</i> .....	25
4.2	<i>Management principles</i> .....	26
	<i>Partnership</i> .....	26
	<i>Conformity of management with context</i> .....	26
	<i>Joint decisions</i> .....	26
	<i>Basing on existing systems and experiences</i> .....	26
	<i>Decentralisation, local management</i> .....	26
	<i>Community based management</i> .....	26
	<i>Flexibility and openness for change</i> .....	26
	<i>Concentration of means and efforts</i> .....	27
	<i>Management of problems and conflicts</i> .....	27

## Figures

---

Figure 1:	Water vision .....	6
Figure 2:	The 'drum of development' .....	8
Figure 3:	The tree of sustainability .....	9
Figure 4:	Environmental Change .....	10
Figure 5:	Partnership in community management .....	12
Figure 6:	The five fields of intervention .....	13
Figure 7:	Dynamism of co-operation: uncertainty - changes - consolidation .....	17
Figure 8:	Responsibilities of the government .....	17
Figure 9:	Local and external contributions .....	20
Figure 10:	Specific water consumption .....	23



# Part A: Fundamentals of Water and Sanitation Sector Management

## 1. INTRODUCTION

### 1.1 Rationale

#### *The challenge*

Drinking water in sufficient quantity and quality is a basic human need, but world-wide three out of five human beings still do not have access to clean water, and only one in four enjoys adequate sanitation facilities. The human, technical and financial resources committed over the past 30 years are not reflected in results on the ground. Of the population nominally served by new water supply and sanitation systems, in many countries only half or less of the people actually use or can use the systems. Water resources are declining in many areas and the daily work of collecting the necessary minimum is a heavy burden for millions of women and children. The poor in developing countries suffer from deteriorating structural conditions such as population growth, ecological degradation, local and international economic crises, increasing political and social tensions. Besides technical, financial and ecological problems, institutional or social shortcomings and lack of management skills are identified as obstacles to sustainability.

#### *International commitment*

Based on the assessment of the lessons learnt from water and sanitation programmes and projects at a global level, international dialogue within the water sector resulted in the formulation of the following guiding principles on water and sustainable development:

- **Fresh water is a finite and vulnerable resource**, essential to sustain life, development and the environment.
- **Water supply development and management should be handled at the lowest possible institutional level** and be based on a participatory approach, involving users, planners and policymakers at all levels.
- **Women play a central part** on the provision, management and protection of water.
- **Water has an economic value** in all its various uses and should be recognised as an economic good.

Benefits should not be seen merely in terms of economic justification. As a matter of fact the availability of water (quantity even before quality) is one of the most important preconditions for well being and health in particular. For poor rural or peri-urban societies an improved water supply system is often the first step in the process of socio-economic development. These first efforts, if successful, can provide the stimulus for other community-based development activities and programmes. Failures, however, can result in a loss of trust and willingness to participate in future initiatives with the project partners.

## 1.2 Scope and intention of this manual

---

This volume belongs to a series of seven manuals about the management of water and sanitation programmes and projects. Being a management tool in particular, it should be of practical help in the technical and non-technical fields, and should serve as a handy guide for the sound and sustainable integration of water supply and sanitation projects in rural or peri-urban societies.

### *Promotion of the recognised objectives of the water sector*

This manual aims to contribute towards the following recognised sector objectives:

- to promote, in a pro-active manner, access to ***drinking water for all in sufficient quantity and of acceptable quality***
- to promote ***affordable, environmentally sound installations*** for excreta and waste water disposal
- to promote the sustainability of the systems through the choice of ***appropriate technologies*** and clear, uncomplicated management systems at all levels
- to promote ***improved hygiene behaviour*** in the population involved
- to safeguard the water resources through ***protection of intake areas***
- to ensure ***proper training and long-term support*** within the framework of water and sanitation programmes
- to promote ***local autonomy and to reduce dependency*** by following the principle of subsidiarity (management at the lowest possible level)

Finally, this manual is intended to encourage project leaders, engineers, technicians and other project partners in the field of water supply and sanitation to develop and widen their own managerial experience and capabilities.

### *Main topics*

The interactive process between learning from experience and introducing better solutions is a key message of this book. Emphasis is given to the following main subjects:

- Participative planning/co-operation/decision making
- Project preparation, project development process and follow-up
- Institution building / community empowerment
- Human resource development
- Natural resource management
- Intersectoral co-operation and co-ordination
- Monitoring and Evaluation (M + E)

## 1.3 How to read this manual

---

### Structure

The manual consists of three main parts:

**Part A: Fundamentals of water and sanitation sector management**

This section provides information on the background and the specific context of water and sanitation programmes and projects.

**Part B: Project implementation**

This section provides information on the development of a project and all important processes and activities

**Part C: Tools for project management**

This section describes the methods and tools used in the planning of projects in a manner which fulfils the basic principles outlined in Part A.

Abbreviations are explained in Appendix B.

### Cross-references

The various references contained throughout the manual have the following meanings:

- (4.1) References to other chapters of this manual
- [Vol. 4] References to other Manuals in this series
- [14] Reference to the bibliography contained in Appendix A

---

## 2. VISION OF SUSTAINABLE DEVELOPMENT

### 2.1 The constraints

---

#### **From constraints to sustainable water and sanitation projects**

(Figure 1)

In the past, water related problems seemed to be more permanent than solutions. One of the main reasons is that many projects in development co-operation neither understood nor sufficiently integrated the local community's perception of development priorities and their strategies of problem solving.

Projects that are carried out with inadequate management tools tend to focus on external values and hence lead to a misunderstanding of the project environment.

Inequalities in the distribution of power and responsibilities between the project partners with regard to finances and decision making is identified as a major drawback for finding solutions that take into account the socio-economic and organisational structures of local societies and the real, locally-felt priorities for intervention or change.

**PEOPLE - IN PEACE WITH NATURE**

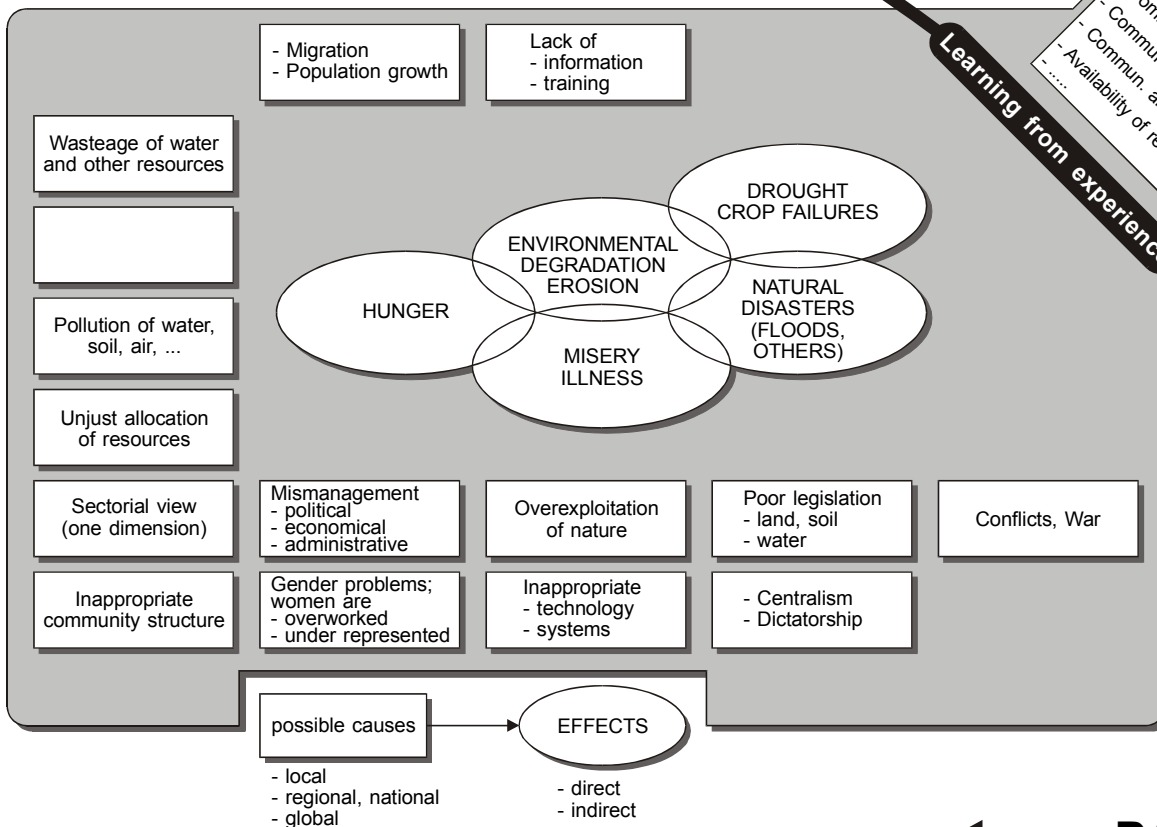


- Learning from experience
- Exchange of views

- Water
  - Soil
  - Trees
  - Food
  - Fooder
- } sufficient quantity  
good quality  
sustainable supply

**S U C C E S S E S**  
**S**  
**W**  
**E**  
**A**  
**K**  
**N**  
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**Water and Sanitation / Live conditions of the poor people**  
**Trends, development**

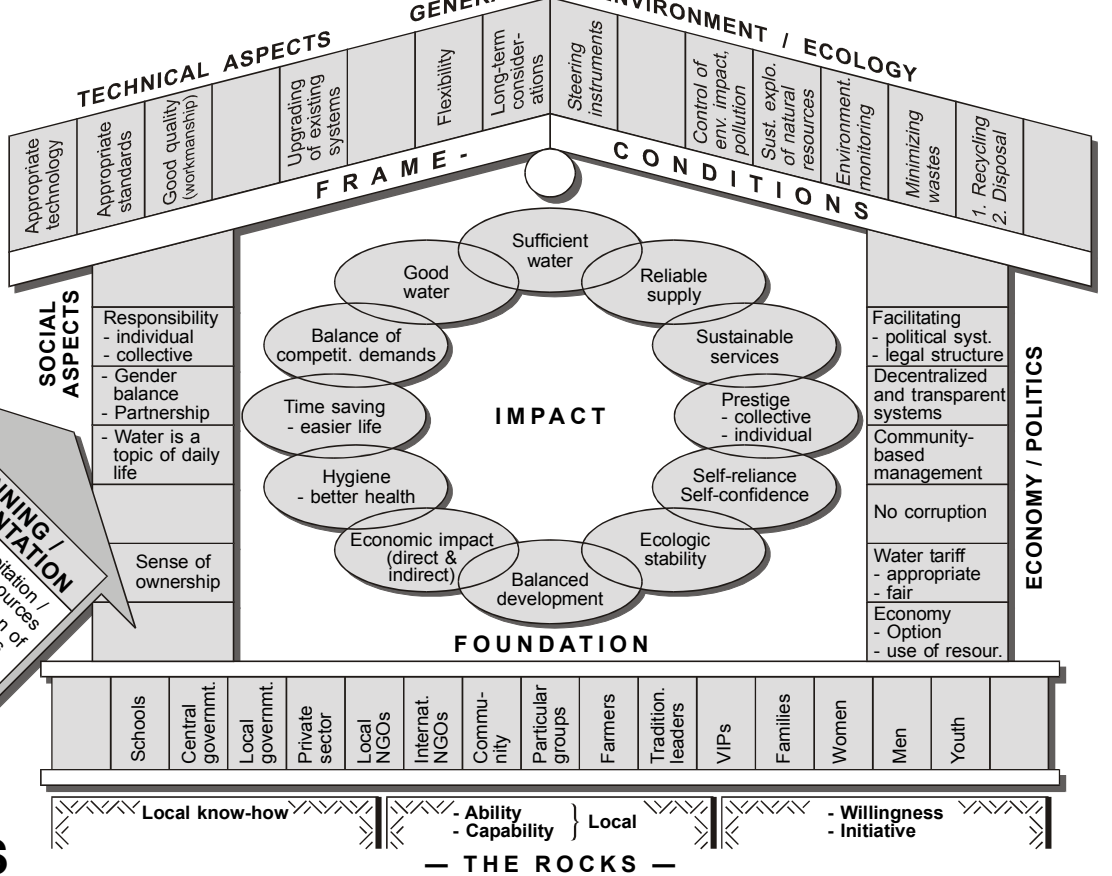


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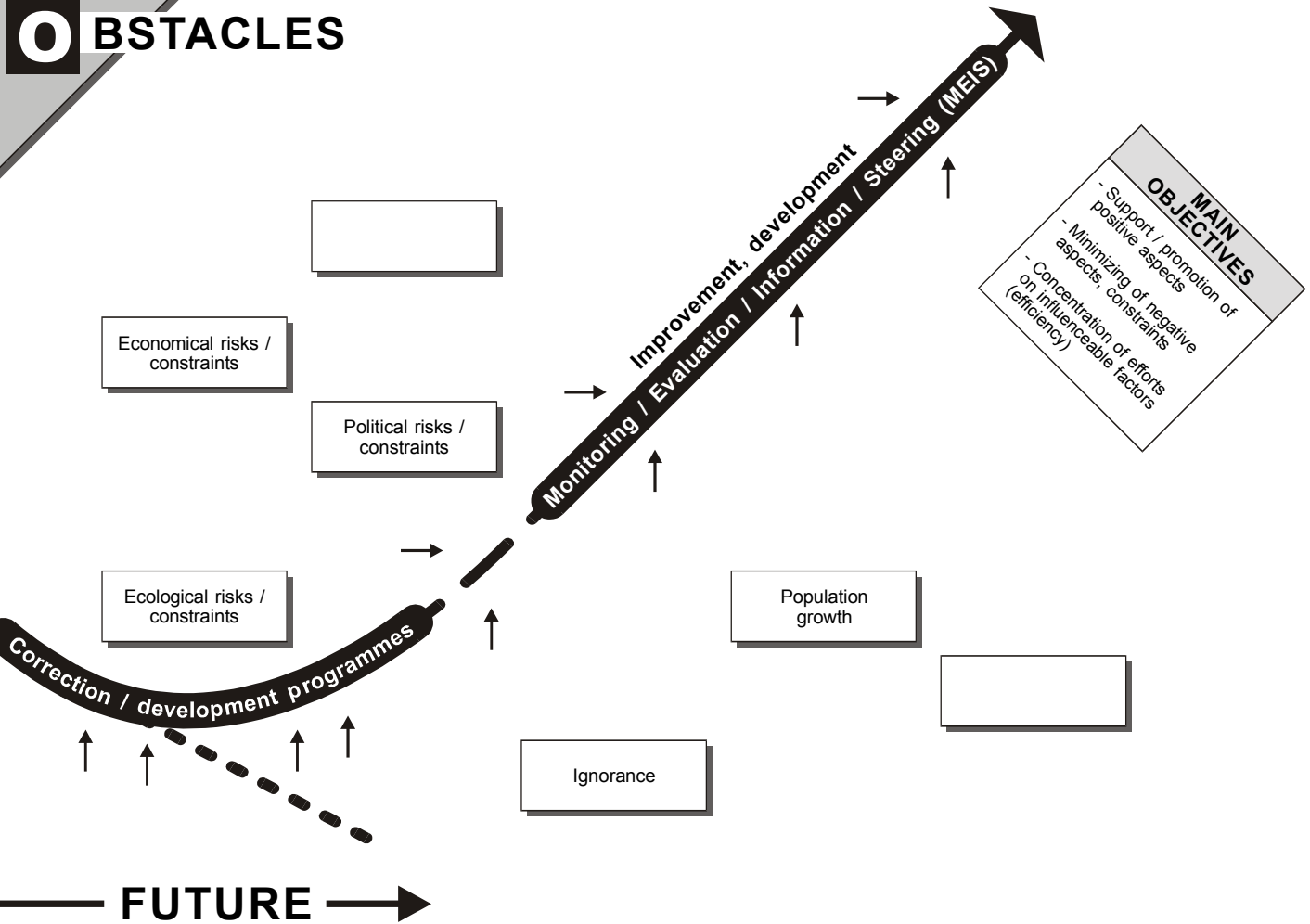
Figure 1: Water vision

**WATER & SANITATION**

**LIKE A GOOD HOUSE**



**P**OTENTIALS  
**O**BSTACLES



## 2.2 Strategy for sustainable development

(Figure 3)

Sustainability means that systems are appropriately handled by the users, which implies that they are efficiently maintained, effectively used and have a lasting positive impact. Sustainability implies acquired autonomy. It cannot be imposed and the potential for sustainability depends as much on the choice of technology, local traditions, organisations, social, economic, natural, and political environment as it does on the real distribution of decision-making power between the project partners. The following components have to be considered as preconditions for sustainable development:

### Balanced development

Balanced development promotes *changes in a local situation* (economy, ecology and society) *on the basis of the existing situation and without negative impacts on another field*. Planning which promotes a sense of ownership and leads to sustainable development should be understood as a continuous *process of fair negotiation* and feedback.

### Project integration

To integrate a project means to plan it while giving due consideration to aspects such as:

- the ability to manage and maintain the system within the local community
- clearly defined positions and relations between all partners
- transparent partnership and knowledge of the overall terms and conditions
- phased intersectoral / interdisciplinary integration: appropriate inter-linking of water, health, environment, economy, forestry, agriculture, animal husbandry, fishing, regional planning, etc.
- integration of activities (co-ordination with and prioritisation among other projects)
- balanced allocation and use of economic and human resources (Figure 2)
- gender balance: active involvement of women in decision-making and management, together with a balanced sharing of the workload within the community
- consideration of the historical context and of traditional practices and decision-making processes

Reinforcing existing institutions, traditional practices and decision making processes is often more effective than creating new structures and organisations.

Only balanced development can raise the quality of life (content of the drum)

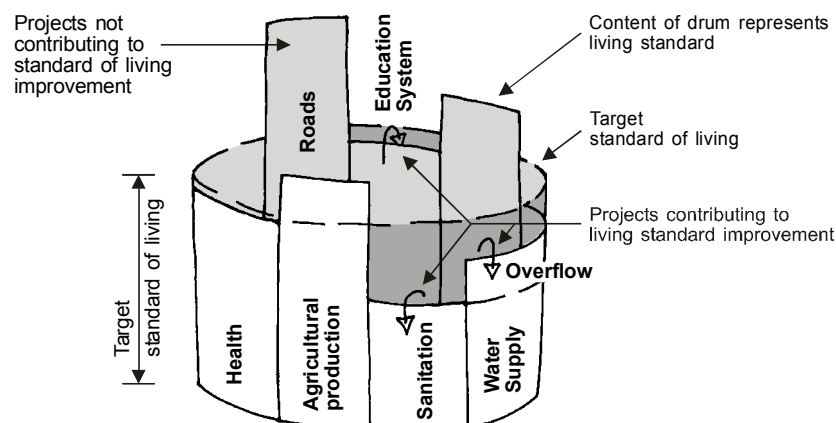


Figure 2: The 'drum of development'

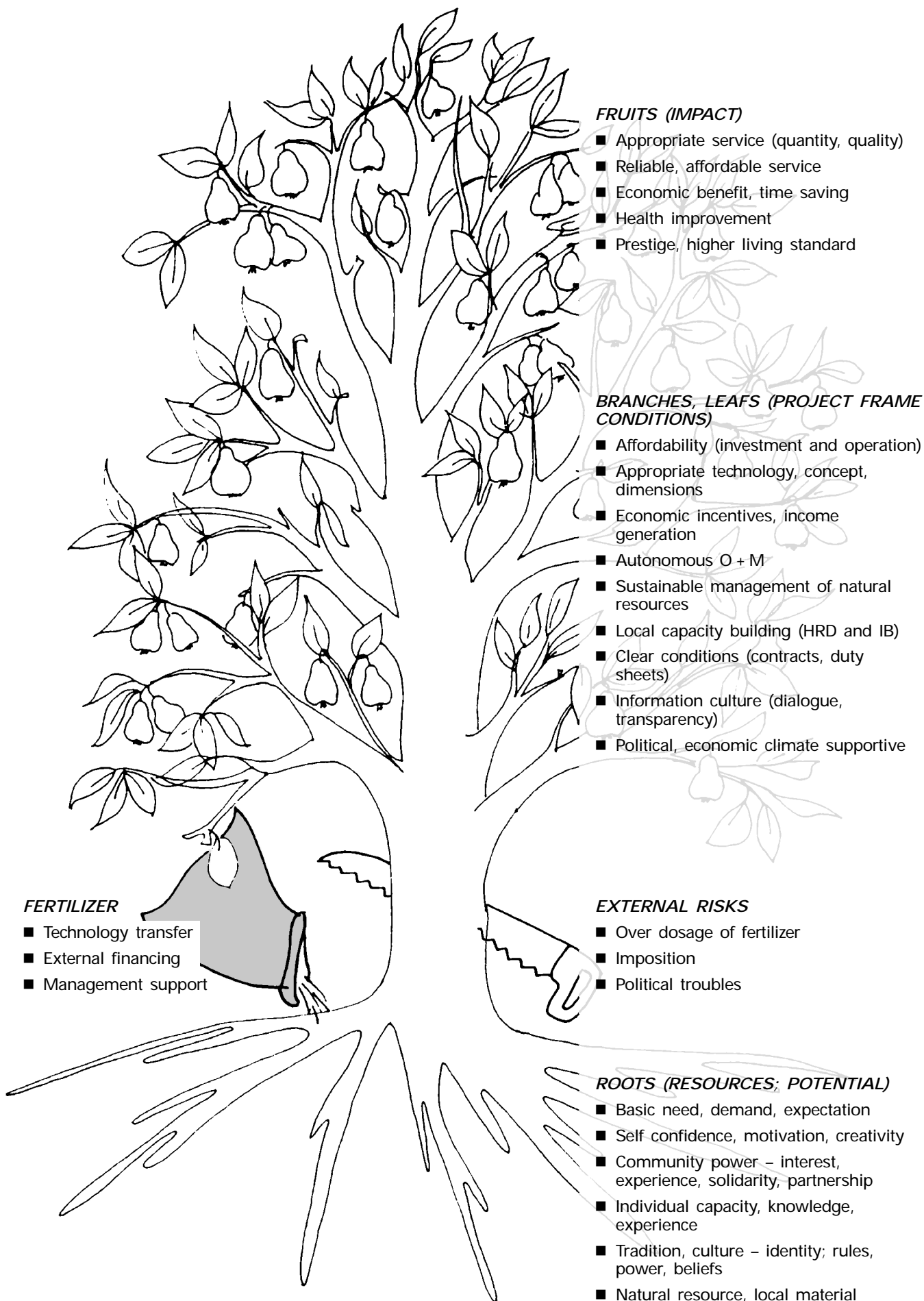


Figure 3: The tree of sustainability

**Ecological integration**

(Water resource and watershed management)

**Principles**

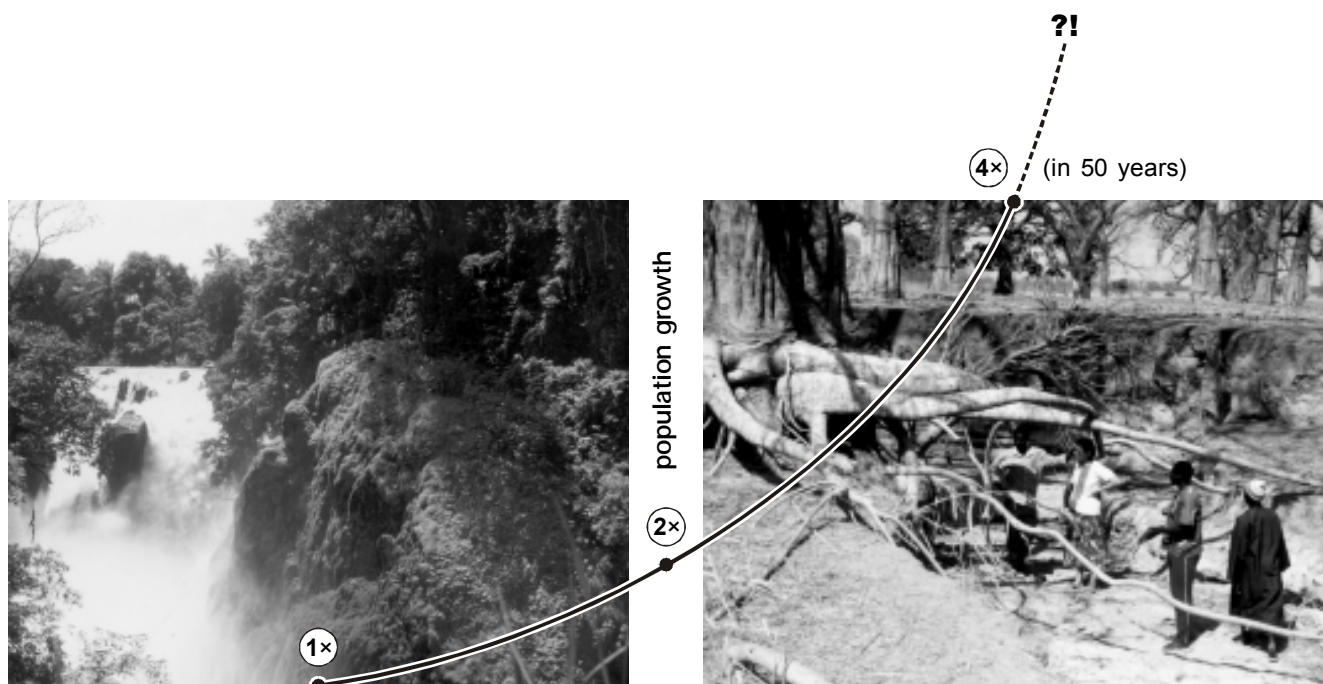
Exploitation of water means intervention in the hydrological cycle. Without a profound knowledge of the natural water situation (quantity and quality) we cannot be sure that a water project will be ecologically sustainable. Besides the various interests of all beneficiaries of a watershed, planners of water projects should support and co-operate with measures for environmental protection and in particular for ecologically sound disposal of liquid and solid waste.

**Key objectives**

- Preservation of sound living conditions for humans, animals and plants (biodiversity)
- Integrated view of, and respect for, water as one element of a diverse ecosystem
- A clear delineation of the area of consideration, which must cover, at least, the area to be influenced by the planned system
- Consideration of, and respect for, the carrying capacity of the ecosystem in the project area including effective forest protection, appropriate farming practices and soil conservation

In many regions of the world basic resources and capacities are exhausted.

- Technically appropriate and environmentally compatible waste management solutions minimising the amount of liquid and solid waste (conservation and recycling of scarce resources)
- Limitation and control of negative, and promotion of positive, side effects.



**When the Grandparents wehre young**

- good diversity and productivity of nature
- well nourished people and animals
- water in abundance

**Today**

- less forest, poor soil
- erosion
- high density of people
- too many animals (herds)
- water shortage, hunger

**Figure 4: Environmental Change**



## 2.3 *A Sense of Ownership through Community Based Management*

---

For rural and peri-urban infrastructure projects in the fields of water and sanitation, community management seems to be more conducive fulfilling implementation objectives than central management. There is a close relationship between participation, management and responsibility. Increasingly, local communities have to undertake responsibilities which for many years were within the remit of central government agencies.

In several programmes throughout the world it has been noted that community management is more successful in achieving widespread and sustainable coverage than a top-down approach with central agency control. For agency staff, the work is both more challenging and more rewarding. Their role will become more a facilitator's than a provider's. Recent experiences prove that successful community management encourages communities to help one another and in that way to achieve more rapid replication.

### *Ten arguments in favour of community management*

- ❶ The use of **local resources**, in collaboration with local people, means that local needs can be met, especially in terms of reaching the poor with basic services.
- ❷ Key decisions are taken by, or at least with, the community (Figure 5).
- ❸ The community is legally and officially authorised to take management decisions, including in financial matters.
- ❹ Direct **people's involvement and responsibility** (personal interest, motivation, sense of ownership, stimulation of development; Figure 5).
- ❺ The community is informed; there is transparency (information generation/sharing of knowledge).
- ❻ There is a strong element of local **capacity-building and empowerment** that is developed through community management
- ❼ Flexible and direct control system: evaluation - decision - guidance - control - experience.
- ❽ The community develops into a strong, reliable partner of agencies, the private sector and government (interactions; learning as a two-way process; Figure 5).
- ❾ **Strong local management** (after the implementation phase) requires less external support.
- ❿ Community management can be effective, efficient, simple, non-bureaucratic, and replicable.

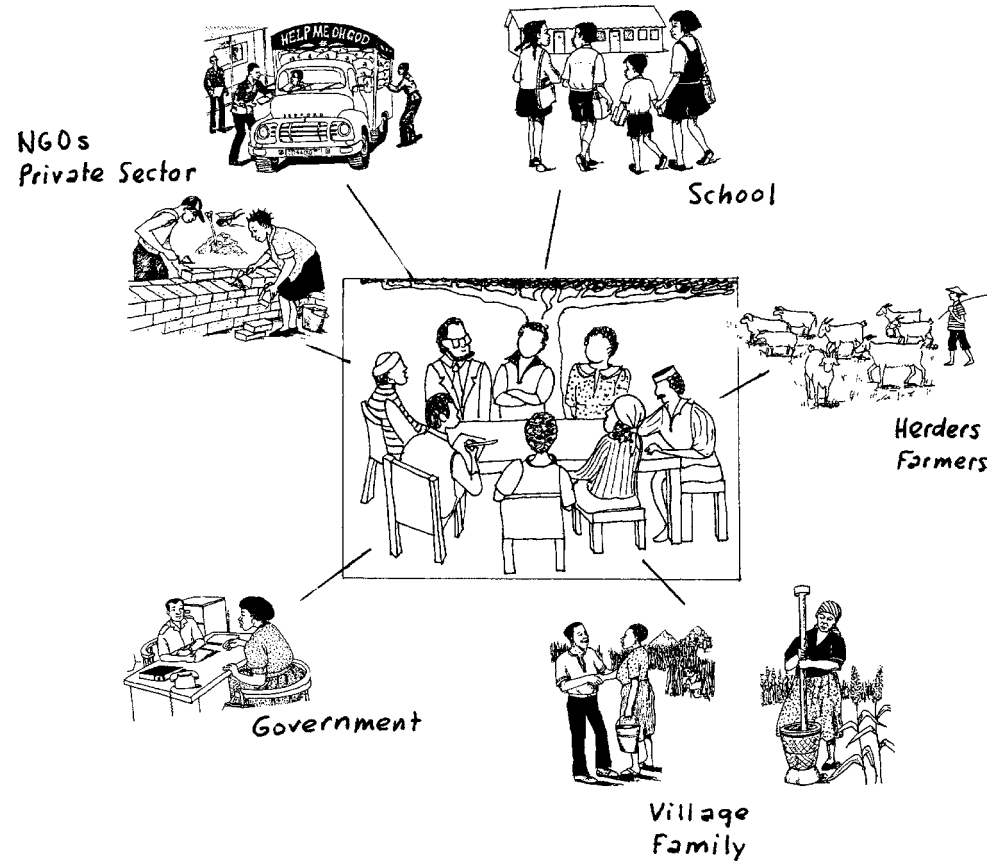


Figure 5: Partnership in community management

### 3. MAIN FIELDS OF INTERVENTION WITH REGARD TO SUSTAINABILITY

#### 3.1 Introduction

##### **Basic view; philosophy**

(refer to SDC sector policy [28])

The sustainability of achievements depends on how far the achievements are integrated into the local cultural and social context, natural conditions, structures and institutions, economic conditions and available technology and skills.

In other words, only programmes and projects that

- continuously interact in a balanced manner with the local context
- provide services that are appreciated by the target population
- make available, to the target population, useful instruments and resources (know-how, funding, established relationships)
- regularly adjust their instruments according to experiences and feedback

can contribute to balanced development and implement sustainable infrastructure assets.

**The five fields of intervention**

For a more detailed analysis, the project environment is divided into five interrelated fields (Figure 6):

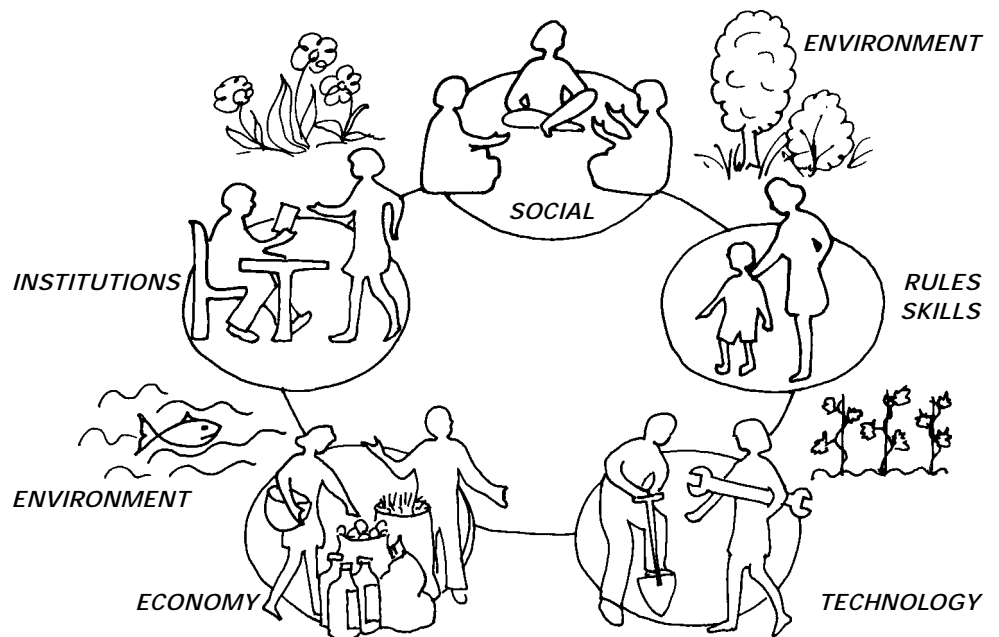


Figure 6: *The five fields of intervention*

**Social Environment**

- Prevailing local customs (social behaviour, standards of living, traditional management systems and technologies)
- Motivation for water supply and sanitation measures and the participation of users, particularly women, in decision-making and implementation processes
- Initiation, planning and execution of systems on the basis of equal status for all project partners with the aim of promoting a sense of communal ownership
- Prevention of social tensions: all members of a community have to be supplied with sufficient drinking water
- Fair working and payment conditions (paid, unpaid labour, voluntary contributions, incentives)

**Institutional Set-up**

- Principle of subsidiarity: management at the lowest possible institutional level with decentralised and lean organisational structures
- Division of tasks and responsibilities between the public, private and NGO sector, as well as among the various levels within a sector
- Efficient, powerful and representative institutions e.g. project committees.
- Inter-institutional co-operation in horizontal and vertical dimensions.

**Economic Conditions**

- Provision of a legal basis for collection and management of funds raised by local project users
- Transparent, safe and clear financial policy and financial management, especially with regard to the subsidy and grant policies of the government and foreign donors
- Financing and resource management

- Promotion of affordable, in most cases low-cost, schemes:  
The implications for different systems, standards and phases (planning, construction, operation and maintenance) with regard to cost and benefit should be discussed by all the project partners during the early planning stage.
- Willingness and ability to pay (in particular, recurrent costs should be met at a local level)
- Flexibility of designs and standards:  
Ideally, a project should be designed so that changes in the demands of the users, e.g. to upgrade service level, quality standards, etc., can be considered.
- maintaining the payment discipline:  
Proper maintenance and reliable services are preconditions for good payment discipline among the consumers (a positive feedback loop)

### ***Technology***

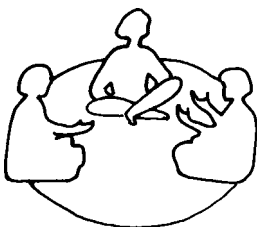
- The elaboration of a technical solution should be based on existing local technologies and available resources
- The choice of professionally sound solutions has to be linked with the requirements of operation and maintenance as well as with available capacities
- Service standards of water supply and sanitation systems and of their components have to meet with sanitary requirements
- The applied technology should be simple, reliable, understandable, and should win the confidence and support of the community.

### ***Rules and knowledge***

- National and local laws constitute the basis for contracts and plans and will impact on water and sanitation projects.
- Traditional law systems (rights on water and land)
- Define clearly the project frame within legal, geographical and political spheres
- Knowledge and awareness of economic, ecological and social risks.
- Managerial and technical skills and their transfer.
- Training and long-term support within the framework of the institutional set up
- Talking about and learning from problems and successes; exchange of experiences.

***Environmental protection and resource management is a trans-sectoral matter of concern. It influences all the five fields and is in turn influenced by them.***

Each of these five fields is now dealt with in turn.



### ***Motivation and involvement of local groups***

## ***3.2 The social environment***

---

The social environment refers to relations between people. These aspects are very much related to the institutional sector as well as to the field of rules and knowledge.

The degree of motivation felt by a community depends on the extent to which a project can create a win-win situation among all partners with regard to the prevailing individual and collective needs (social prestige, reduction of hardship and problems, benefits, convenience). For this reason, all project partners should be involved in making decisions which affect them. Specific attention must be paid to

traditional rules and rights concerning the use and management of water. In the field of drinking water provision and hygiene, women in particular have a considerable responsibility. If women are not included in decisions, their needs, and their capacity to contribute to the project, will be misjudged. This can often lead to ill-informed and inadequate planning.

***Water and sanitation projects impact on social relationships*** (distribution of power and labour between men and women, traditional and modern authorities, nomadic and sedentary populations, etc.). Planners have to be aware that either hidden or open opposition may arise. However, the creation of well balanced management committees and participative decision making methods will still lead to commonly accepted solutions.

### ***Community based management***

The Community-Based Management strategy implies transparent behaviour on the part of all participants in the programme. It includes the choice of appropriate methods of negotiation to assess the real needs and potential of local structures. Alternative solutions should be developed and compared.

One of the central tasks within community-based management is to negotiate the ***distribution of authority and responsibility among the various actors concerned***. Responsibility should be taken as far as possible by the users, and should be based on traditional rules of water management.

National sector policies, as well as regional and urban development plans, should include and support the promotion of self-administered water and sanitation systems at the appropriate institutional level.

### ***Participative development co-operation***

Participative co-operation facilitates a transparent and comprehensive collection of facts and expectations. This can lead to better, and better-accepted, decisions. It also creates opportunities for interactive learning and, most importantly, promotes ***commitment, motivation, partnership and a sense of responsibility and ownership***.

### ***Transfer of ownership***

A central aim of the participatory approach is to foster the project users' sense of ownership. Ownership begins with planning and the project ensures the involvement of users at each stage of the process, from problem analysis on through planning, implementation and consolidation.

While ownership through participation is a straightforward aim, its realisation, in conjunction with the project goals of equity and sustainability, encounters many challenges. Communities are not homogeneous but highly stratified in terms of wealth, power and ownership patterns. The main response of the project to this situation should be to focus introductory activities on small and socially homogeneous groups. Based on positive co-operative experience in these groups, it becomes possible to approach more complex issues affecting the community at large.

In technical terms, for example, issues of watershed management apply to quite large areas. However, an effective participatory approach requires the project to break down its unit of planning and operation into relatively small socially viable entities.

**Gender structures**

Management by women at the domestic level and in family health is generally acknowledged. But at project level there is still an emphasis on their physical contribution to construction and care-taking. ***Women's capability and capacity in decision making, in management and in economic production receive far too little attention and should be promoted.***

Women and men have specific technical, social and ecological know-how and experience, as well as their own forms of organisation, which can contribute to improving water and sanitation infrastructures. In the planning, implementation and evaluation of water and sanitation projects, women and men should be involved as partners with equal rights, and existing obstacles to their participation must be eliminated or reduced. The technical, institutional and educational or training means applied must be adapted to their needs and capacities. Gender-Balanced Development means that project activities should

- have no negative effects on women and on prevailing gender relations
- be at least as beneficial to women as to men,
- give priority to women as they are chiefly responsible for children and are the main victims of poverty.

Existing inequalities should not be reinforced and water should not remain or become a burden of women only. However, in situations where equality cannot be guaranteed or is not possible, the principal responsibility for water supply management should be vested in women, as long as this does not cause cultural problems by excessively challenging the gender division of responsibilities and labour in a particular society.

**Social integration of projects**

Are the individual and the communal goals, expectations, hopes, doubts and fears known and respected? First of all development activities should be 'integrated in the hearts' of the persons concerned. Projects and their technology should be accepted, understood and desired by families, by different social groups and by communities. Maintaining good relationships between the local administration, elected or nominated members of public bodies and the general population, facilitates communication and co-operation.

**Management of change and dynamism of co-operation**

(Figure 7)

Change creates uncertainty and fear. A project, which is a process of unfreezing, change and consolidation, needs extensive discussion among the people concerned and competent accompaniment by reliable development workers. The consolidation phase is a confidence- and capacity-building process, which needs time as well as local and external efforts and support. The engagement periods and necessary input, especially for the phase of consolidation, are often underestimated.

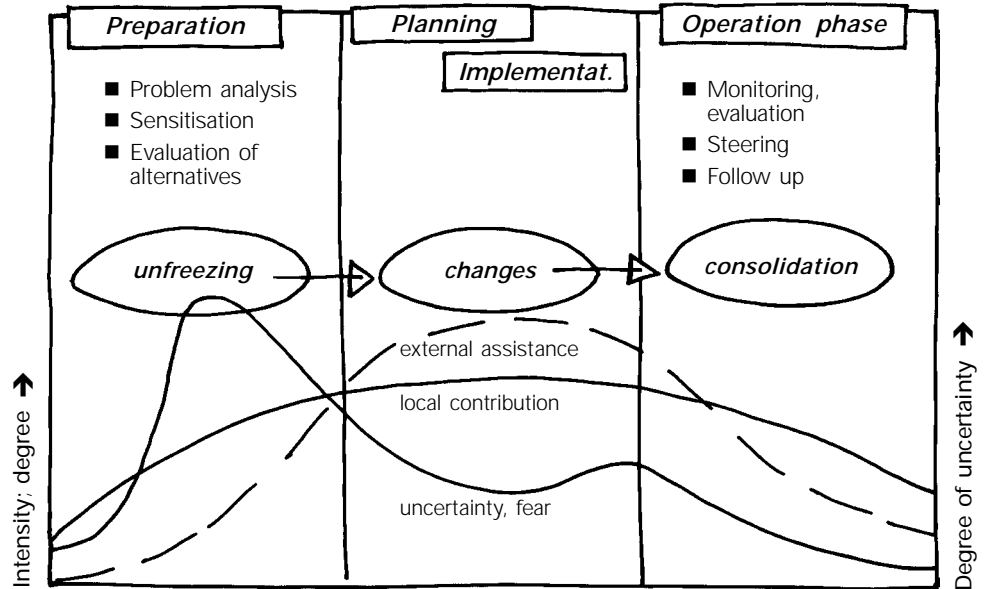


Figure 7: *Dynamism of co-operation: uncertainty - changes - consolidation*



### 3.3 Institutional set-up

Projects in the water and sanitation sector are highly dependent on the political, institutional and technical ability and limitations of the partners concerned.

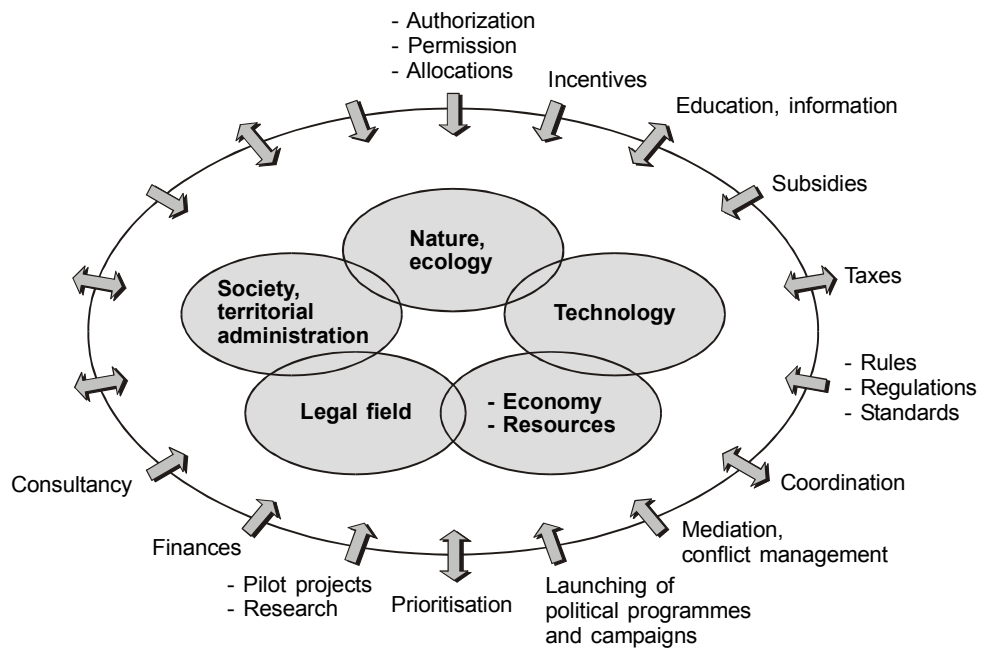


Figure 8: *Responsibilities of the government*

### ***Involvement of NGOs and the private sector***

***Sustainable development is based on shared rights and responsibilities among the public and private sector and project holders.*** Whereas responsibility for law and order should rest with the public sector, the involvement of the private sector and NGOs as partners in other tasks and activities can result in beneficial synergy and greater efficiency on both sides (less bureaucracy).

Locally based and managed NGOs can be competent mediators between the project holders and the public sector. They have often developed mechanisms for project implementation which meet the needs of the populations concerned and lead to sustainable development.

An improved interaction between the project holders and the private sector can also contribute to increasing the project quality. The dynamics of the market are at least as strong as the power of legislation. The increased involvement of private companies can improve efficiency and reduce costs.

***Transparency regarding the roles and responsibilities of all stakeholders in a project is a prerequisite for efficiency and effectiveness.***

### ***Strengthening of institutions***

Strengthening of the institutional capacities of the various actors may be achieved by different means, e.g. targeted training activities, support in the creation or adaptation of specific institutional structures, or simplification of internal administrative procedures, in particular as regards decentralisation of activities. In order to strengthen institutional capacities, clear contextual conditions need to be set out by national sector policies (based on participative processes involving all the relevant groups of the population).

Co-ordination and collaboration between government institutions, NGOs and the private sector requires a clear definition of the role of each partner, especially in terms of what each can expect from the others. In this respect, clear and equitable channels of communication are essential (e.g., in calls for tender, elaboration of contracts, guaranteeing quality of work done, etc.).

The successful implementation of water and sanitation programmes which extend over several administrative regions, or over an entire country, depends on a reliable national administrative structure with adequate executive instruments.

Clearly mandated tasks such as design, implementation, certain maintenance, training, etc. can be assigned to the private sector or to NGOs.

The public sector may be directly involved in any of the activities in the project cycle. However, typical areas where a public sector involvement is essential or even necessary are:

- policy making
- provision of a legal framework
- sector planning and financing.

### ***Institutional changes and flexibility***

Organisations and structures are constantly going through processes of change. This dynamic brings risks and opportunities at the same time. The need for structural adaptation and for overall flexibility should always be borne in mind.





### 3.4 Economic conditions

In most parts of the world, water is considered a public good. It is also seen as gift, either from nature or in terms of traditional or modern belief systems. In many cases, water can be drawn from natural sources, without any technical and financial input, and used without prior treatment. This is clearly most advantageous for the consumer. Payment for water supply, when it is levied from the consumer, is justified on the basis of investments necessary to safeguard or increase the quantity or quality of water supplied, or to increase the level of accessibility of the supply. Reliable supply, appropriate pricing and financing models for investment and recurrent costs play a key role with regard to the economic sustainability of systems. Often, payment policies increase the burden of poor consumers. The parallel promotion of economic activities (which may or may not be based on an increased water supply), leading to increased household income, or the inclusion of supportive measures in the payment regime, can alleviate this situation.

#### **Tangible benefits**

In the long term, water and sanitation installations will have an impact if they provide clear economic advantages and relief or if there is an associated increase in prestige or quality of life. Improved water and sanitation installations can achieve sustainability if the users derive real economic (and health and ecological) benefits over a long period of time.

For example, even if one of the results of a water supply project is a saving of time on the part of women whose duties include water collection, it cannot be assumed that the time thus saved will be used in income-generation, especially if the women do not have access to the necessary resources and if the local economic environment is not favourable.

#### **Financial compatibility**

(Figure 9)

Funding from external sources (the local exchequer and donors) will remain limited or may even decrease. **Decreasing public contributions and reduced support from external agencies call for an approach that reduces expenditures** (economical projects, low-cost solutions) **and increases local contributions** (financial and physical contributions, local management, etc.).

The concept and design of a project must consider the socio-economic capacity of the project holders. Today, Willingness to Pay (WTP) studies are increasingly used to assess this capacity. Through the use of participatory appraisals and observations the regional and local economic situation as well as the economic situation at family-level are roughly estimated. The real interest in water and the priority given by the people themselves are essential considerations both in the technical design of water systems and in the planning of water charge structures. Cost-benefit analysis and opportunity cost analysis can help to ensure that commitments to a water project will not cause a diversion in the allocation of resources from other essential activities or services such as education, food production, health care, etc. The fact that willingness and ability to pay are variable factors in a changing economic environment should also not be underestimated.

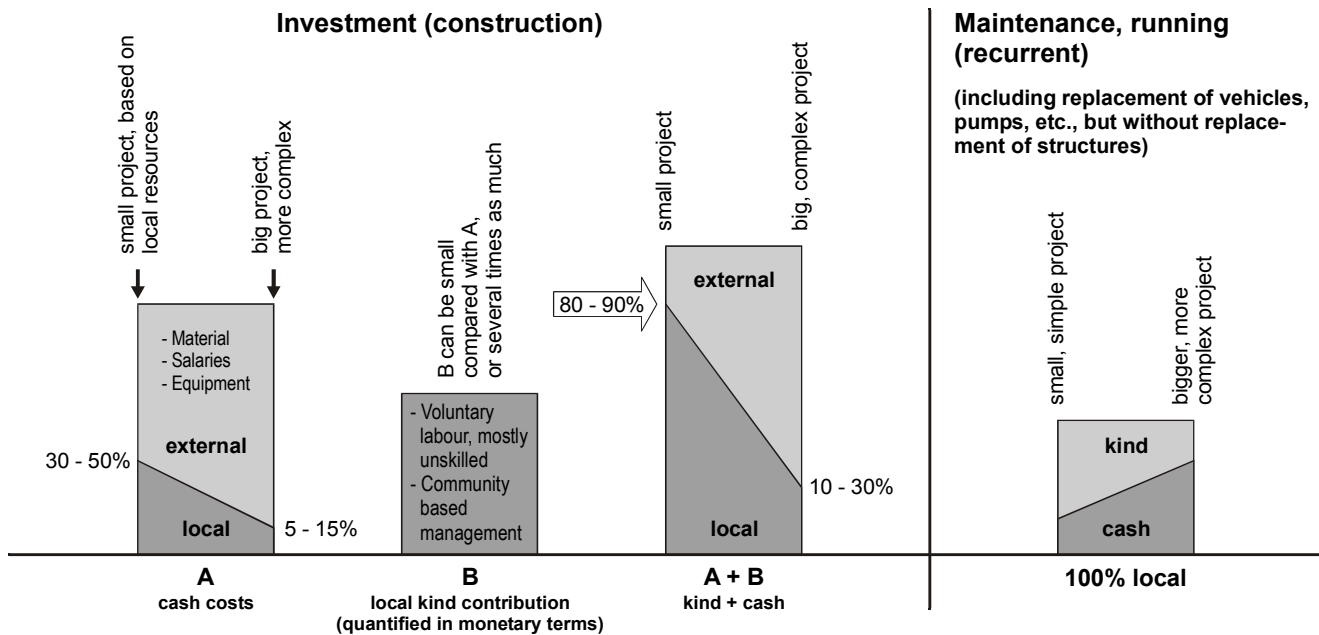


Figure 9: Local and external contributions

**Willingness and ability to pay**

The Willingness to Pay (WTP) and ability to pay (ATP) on the part of the local stakeholders for water and sanitation projects can be influenced positively in a number of ways, as the following table shows:

Factors influencing WTP and ATP	Degree of Strengthening of:	
	WTP	ATP
Increase in water quantity (if water is scarce)	xxx	x
Easier access and increased convenience (time savings, private connections)	xxx	x
Better quality of water	x	x (*)
Increased reliability in supply	xxx	x
Income generation (economic activities requiring a supply of water)	xx	xxx

(\*) Improved water quality can contribute to a reduction in illness, allowing people to be more economically active and perhaps reducing medical costs. This can lead to more income in the household, thus increasing the ATP.

xxx: greatly influenced; xx: moderately influenced; x: some influence

**Cost recovery, appropriate pricing and financing models**

Appropriate *pricing and financing models play a key role as regards economic sustainability*. In the medium term, adequate self-financing and cost recovery of operation and maintenance costs is required. Financing models must be found which can be applied to both the public and the private sector. They must be based on an adequate contribution towards construction costs on the part of the end users. Neither in industrialised nor in developing countries it is possible for rural communities to meet the full costs of infrastructure investments. Government contributions, levied through normal taxation or from other sources, are needed to enable villages to improve their basic services. Figure 9 shows an example of how cost could be shared among the partners.

Apart from the initial investments, an ongoing financial commitment sustained by water tax contributions is also necessary to ensure that improved water supply and sanitation continue to function all year round. A tariff system should work as a steering instrument, allowing particular or unforeseen situations to be dealt with, while meeting the interests of the population in general and of the poorest in particular. Appendix N shows different financing and tariff proposals for community projects (investment and running costs). Comparative lists with conditions, advantages and disadvantages in particular strategies are shown. [27]

### **Credits and deposits**

Regarding credit and deposits, communities face two main challenges:

- Access to affordable credit (reasonable interest rates)
- non-bureaucratic, financially attractive and secure options for depositing collected funds

Where attractive and safe banking is not possible, project holders cannot be expected to accumulate funds over extended periods. Sometimes local, para-statal or private institutions, e.g., co-operatives or credit unions, are viable alternatives.

Some communities have had good experiences with revolving funds if the following conditions are fulfilled:

- Reliable water supply service
- Trustworthy management with reasonable interest rates, clear conditions and associated sanctions
- A high level of prior contributions on the part of the applicants for water and sanitation facilities
- Local stakeholders must undertake to provide collateral for the loan (in cash or in kind). Funds advanced in credit shouldn't be converted into grants at a later time.

The use of short-term credits from pipe suppliers or vendors has become common; it is very important to make sure that this does not lead to dependency or to a lower quality of supplied goods.

Loans should only be taken to bridge short-term cash-flow problems. The overall financing of an investment programme, including loan repayment, must be assured in advance.

### **Paid and unpaid work**

Cost reduction through local voluntary contributions is the main feature of community projects. The more a community can do through local initiatives, the more cash costs can be reduced. The work invested by users in the autonomous planning and monitoring of a project should be counted as a contribution on the part of the end-users. ***So called 'unskilled labour' should be quantified in monetary terms, otherwise the value of these important contributions is not recognised.***

Periodic general community work may be expected from all active members of a village. The specific contributions of those who perform functions in the water supply management process (e.g., chairperson of a committee, treasurer, etc.) are considered as unpaid social contributions. However, if an individual fulfils a key executive function, such as that of a caretaker who is responsible for the operation of a whole water scheme and who works 10 hours per week (or 20, or more, depending on the particular situation), he or she must be adequately paid or compensated. The form of payment must be covered by tariffs. In many cases compensation in cash seems appropriate.

### ***Easing of financing problems***

For an increasing number of communities where water systems have been constructed without considering local financial capacity, the financing of construction and running costs becomes a heavy burden. Relief may be achieved by the following strategies:

- One main option is the re-dimensioning of designs and standards leading to the construction of more economic systems. Dimensions, flows and operating rates for machinery should be calculated correctly, not with hidden reserves. Often projects become financially viable if completed in stages.
- With progressive tariffs, water charge regimes can be adapted to the needs and capacities of different consumers. A basic consumption of, for example, 20 l/day per person (approx. 3,000 l/month per family) is charged at a low rate. Consumption above this level is charged at a higher rate.
- Once drinking and domestic water requirements have been met, any surplus could possibly be used for income-generating activities. Depending on local conditions, these could include: production of vegetables, building materials, hydraulic energy, or any small enterprise requiring a supply of water.
- Local capacity building and community based management and maintenance are efficient strategies to economise the running of infrastructures.
- Training national and local teams in designing their own projects and implementing them either through their own agencies or through well-qualified and supervised contractors.



### ***Choice of technology***

## ***3.5 Technology***

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For water and sanitation systems to be sustainable they must be technologically appropriate and there must be no negative impact on the environment. Technical appropriateness has to be defined and negotiated with the users during the feasibility study. ***Aspects such as available know-how, affordability, local material and training facilities as well as the social context in which the infrastructures are installed must be considered.*** In this manner the introduction of new risks through new systems can be reduced. Such shifts towards new risks occur when an improved water and sanitation infrastructure lowers the ecological and health risks, but creates new economic (maintenance costs), political (dependencies) and social risks (weakening of existing structures, of rules and regulations as well as of skills and knowledge).

A long-term concept, allowing construction in stages and gradual upgrading, is normally more appropriate than large-scale and so-called once-and-for-all solutions. Often it is more reasonable to upgrade the operation and maintenance of existing systems or to repair and rehabilitate inoperative installations than to build new ones. The local construction of systems or of single components (e.g., hand pumps) should further be promoted. Appendix D provides a checklist and a matrix form that allows a rough comparative technology rating of different alternatives.

### ***Linkage of technology to O+M***

Particular attention has to be paid to linking the choice of technology with Operation and Maintenance (O+M). Aspects such as the capacity required to manage and finance the O+M of the chosen technology and system need to be considered. Low cost solutions are viable and appropriate if they allow easy and affordable O+M, which assures a reliable supply and service standard within the life span of the system. It is only under such conditions that willingness to pay, another prerequisite for sustainability, can be maintained.

**Water quality and quantity**

Appropriate norms and standards come into play in the context of water quality and quantity. Guidelines such as those of the WHO [3] can serve as a starting point for the discussion of quality and quantity standards. Standards should serve as targets that can be achieved within the locally prevailing natural and socio-economic situation. Unrealistic standards may substantially reduce the number of people who can be supplied at all. External agencies and donors, at the same time, should refrain from imposing theoretical standards, particularly those that are unrealistically expensive. Risk assessments through sanitary surveys may lead to more appropriate and holistic solutions than trying to meet rigid standards. Water consumption can vary widely in different societies and areas (Figure 10).

**Use of computers**

Computers should only be applied if the respective know-how for handling of the devices and software as well as service and support are available. For skilled personnel there are a number of reliable software products on the market that can ease the task of management and administration.

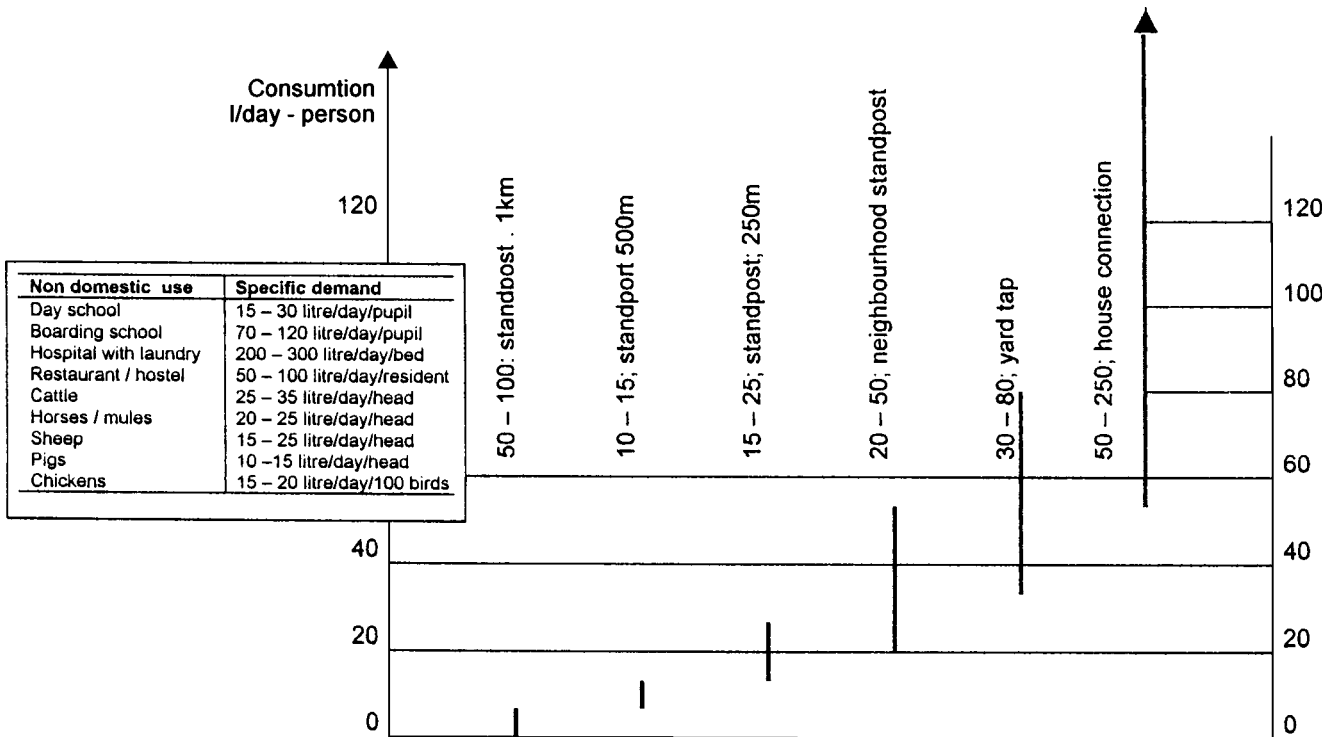


Figure 10: Specific water consumption

**Technical standardisation**

Given the great variety of materials available, standardisation within national programmes is essential, otherwise the handling of building materials and spare part stocks becomes very difficult and uneconomical.



### ***Ability to solve problems***

## **3.6 Rules and knowledge**

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Time and energy are invested in transmitting experiences and values from one generation to the next. The transmission of knowledge is always related to the cultural background and the social organisation of a society. Most human societies comprise a division of labour that functions between genders and professional groups, as well as between the families and the communities. Each segment has its own knowledge (experience) and rules (defining rights and obligations).

The communities' or users' knowledge in the social and technical fields forms the foundation for a sustainable water and sanitation installation.

It is of utmost importance for the sustainability of a project to identify the knowledge and influences of each group within the local community, and to integrate their potential in the operation and use of improved water and sanitation installations. The functioning of the projects relies after its completion on the management capacity and skills of these groups. As every society undergoes change, promoting the beneficiaries' problem-solving capacity can foster socio-cultural sustainability.

### ***Learning at all levels***

Educational components in planning, implementation and follow-up of W+S programmes contribute to reinforcing the problem-solving capacity of the community of users. Their knowledge in the social (rights and obligations) and in the technical (operation and maintenance) fields forms the foundations of a sustainable W+S system. W+S improvements often require from the project holders an awareness of new, complex factors; e.g., an understanding that water is available only in limited quantity and must thus be used judiciously along with hygiene and environmental measures.

The dynamics of the learning process must be taken into account as they follow different patterns in different socio-cultural contexts. Appropriate and up-to-date methods must be applied, and preference should generally be given to on-the-job training rather than to formal teaching.

### ***Exchange of experience within international networks***

Many promising products and concepts have evolved from user-oriented research and development carried out in countries of the South. The knowledge acquired in recent years and the exchange of information between developing countries, i.e., the South-South contacts, must be promoted. To this effect, international networks should be expanded further. Research efforts should be particularly intensified in the fields of better sanitation and more economical waste management.

## 4. BASICS OF PROJECT MANAGEMENT

### 4.1 Scope and definitions

#### ***What is a project?***

A project in the W+S sector is understood to be an undertaking with defined objectives, to be carried out with certain means under defined boundary conditions, for and with a user group in a given geographic region, in order to solve specific problems or improve a particular situation. A project develops according to a defined route of processes and actions. Normally, project development is split into **four main phases: preparation, planning, implementation, and operation & maintenance.**

#### ***What does project management mean?***

Project management is the planning, organisation and steering of activities and processes within the project development, considering interactions and dependencies, within and towards defined institutional or sectoral objectives and goals. Management also includes decision making and ongoing adaptations according to information gathered through an in-built monitoring and evaluation system.

#### ***Systematic approach***

For complex works like the establishment of W+S projects a systematic approach and the application of specific tools are needed to support or promote decisions and processes towards the anticipated goals.

#### ***Integration***

Systematic management is an approach which looks

- backwards (consideration of experiences)
- sideways (intersectoral and inter-institutional co-ordination)
- ahead (identification of potential, needs, goals and threats)
- inside, on both the individual and collective level (find out wishes, hopes, needs, fears, doubts, opposition, contradictions)
- with the eyes of my neighbour, in order to understand his/her position

#### ***Goal orientation***

Planning and management together allow the

- integration a project
- identification of optimal strategies and policies
- move from vision to achievement

## 4.2 Management principles

---

<b>Partnership</b>	Principle of equal rights among partners (fairness)
<b>Conformity of management with context</b>	The application of the management principles listed below can assure that the project management incorporates not only the experiences of the W+S sector, but also those of other sectors.
<b>Joint decisions</b>	Decisions involving all parties are more balanced and acceptable than decisions representing single views or interests.
<b>Basing on existing systems and experiences</b>	Management tools should correspond to local situations, traditions and needs. New tools should, as much as possible, be developed in an integrated manner and should be based on existing structures, using local experiences, skills and habits.
<b>Decentralisation, local management</b>	Central management (top-down approach) is often inflexible and bureaucratic, and has led to unfavourable experiences in different sectors. Problems of inefficiency and misunderstanding arise when decision makers, managers and target groups are separate from each other, both in terms of physical distance and perception.
<b>Community based management</b>	Experiences in many developing countries show that even the best run water agencies cannot successfully implement, operate and maintain a network of widely dispersed water systems without the full involvement and commitment of the users. <b>Evidence is accumulating that properly supported communities have both the ability and the willingness to manage their own water systems.</b> The objective should be to create structures and processes which support local implementation, operation and maintenance.
<b>Flexibility and openness for change</b>	<p>Readiness to meet challenges and changes is a most important pre-requisite for successful management processes. Such changes may be caused by outside influences and, at the same time, by inner developments; even the orientation framework for a better future is continually under review.</p> <p>Flexibility and dynamism are not to be confused with lack of focus. Instruments must easily allow phasing (i.e., the construction of a system in stages) and upgrading (i.e., the gradual improvement of the size and sophistication of a system).</p> <p>The respective tools cannot be created all at once; after being developed they need to be tested and adapted under working conditions. Based on the users' experiences they can be optimised step by step.</p>



***Concentration of means and efforts***

To make best use of any kind of institutional and material resources the project management should strive for the allocation of means, where

- willingness, commitment and local engagement is high
- efficiency and effectiveness are reasonable
- co-ordination and co-operation allow synergy
- sustainable development is promoted

***Management of problems and conflicts***

Problems should not be ignored, but recognised and treated accordingly and without delay.

- Sometimes it is better to avoid or to bypass a problem than to solve it. Unavoidable constraints should be 'integrated' in a manner that causes minimal disturbance. Problems should be solved properly and completely, if possible. In the field of 'problem management' creativity is very important.
- Trouble makers should be integrated through co-operation and assignment of rights and responsibilities.



Pollution-diseases



High costs



Waiting time



Conflicts

## TABLE OF CONTENTS PART B

<b>Part B:</b>	<b>Project Development .....</b>	<b>33</b>
<b>1.</b>	<b>PROJECT CYCLE AND ACTORS .....</b>	<b>33</b>
1.1	<i>Introduction .....</i>	<i>33</i>
	<i>Context .....</i>	<i>33</i>
	<i>Objectives for optimum project development .....</i>	<i>33</i>
1.2	<i>The project cycle .....</i>	<i>34</i>
	<i>Characteristics .....</i>	<i>34</i>
	<i>Explanation of Figure 12: Project cycle .....</i>	<i>35</i>
	<i>Project visions .....</i>	<i>36</i>
	<i>Participation .....</i>	<i>36</i>
	<i>Context awareness .....</i>	<i>36</i>
	<i>Flexibility .....</i>	<i>36</i>
1.3	<i>The stakeholders and their involvement .....</i>	<i>36</i>
	<i>Identification of stakeholders .....</i>	<i>36</i>
	<i>Stakeholders, their typical roles and relationship .....</i>	<i>38</i>
	<i>Water and sanitation knowledge system (WSKS) .....</i>	<i>40</i>
	<i>Gradual empowerment of management bodies for O+M .....</i>	<i>41</i>
	<i>Varying degrees of involvement .....</i>	<i>42</i>
<b>2.</b>	<b>BEYOND THE PROJECT – THE NATIONAL CONTEXT .....</b>	<b>42</b>
2.1	<i>Introduction .....</i>	<i>42</i>
	<i>Overview .....</i>	<i>42</i>
	<i>The global context .....</i>	<i>43</i>
	<i>Access to water is a basic human right .....</i>	<i>43</i>
2.2	<i>Assessment of the national context .....</i>	<i>44</i>
	<i>National and regional sector policy .....</i>	<i>44</i>
	<i>Boundary conditions .....</i>	<i>44</i>
	<i>Partner profile .....</i>	<i>44</i>
	<i>The water and sanitation situation .....</i>	<i>44</i>
	<i>Sector relevant changes .....</i>	<i>44</i>
2.3	<i>National standards of water supply and sanitation projects .....</i>	<i>45</i>
	<i>Main objectives of national standards .....</i>	<i>45</i>
2.4	<i>Evaluation of the national context .....</i>	<i>46</i>
	<i>Successes and problems in the various fields .....</i>	<i>46</i>
	<i>Prioritisation of problems .....</i>	<i>46</i>
2.5	<i>National level policy - Programme Strategy .....</i>	<i>47</i>
	<i>Democratic development of strategies .....</i>	<i>47</i>
2.6	<i>Legal basis .....</i>	<i>48</i>
	<i>From hindering to supportive laws .....</i>	<i>48</i>
	<i>Existing legal framework .....</i>	<i>49</i>
	<i>Traditional rights .....</i>	<i>49</i>
	<i>Legal principles .....</i>	<i>49</i>
	<i>Financial principle .....</i>	<i>50</i>
<b>3.</b>	<b>PROJECT PREPARATION .....</b>	<b>50</b>
3.1	<i>Introduction .....</i>	<i>50</i>
	<i>Overview/objectives .....</i>	<i>50</i>
3.2	<i>Appraisal of the local context (socio-economic survey) .....</i>	<i>50</i>
	<i>Introduction .....</i>	<i>50</i>
	<i>Main aspects of the assessment .....</i>	<i>51</i>
3.3	<i>Project objectives and related targets .....</i>	<i>53</i>

3.4	<i>The evaluation of the local context</i> .....	<b>54</b>
	<i>Sustainability criteria</i> .....	54
	<i>Dialogue among local and external stakeholders</i> .....	54
3.5	<i>Project organisation</i> .....	<b>54</b>
	<i>Basic organisation</i> .....	54
	<i>Who does what? Why? How? When?</i> .....	55
3.6	<i>Feasibility study</i> .....	<b>56</b>
	<i>Introduction</i> .....	56
	<i>Selection criteria</i> .....	56
	<i>Global view and reduction of number of options</i> .....	59
	<i>Recommendation</i> .....	60
3.7	<i>The stakeholders, their specific responsibilities and duties</i> .....	<b>62</b>
	<i>Introduction</i> .....	62
	<i>The stakeholders</i> .....	62
	<i>Responsibilities and duties</i> .....	62
3.8	<i>Choice of option, final decision, project agreement</i> .....	<b>64</b>
	<i>The choice of option and the final decision</i> .....	64
	<i>The project agreement</i> .....	64
<b>4.</b>	<b><i>PROJECT IMPLEMENTATION</i></b> .....	<b>66</b>
4.1	<i>Introduction</i> .....	<b>66</b>
	<i>Context</i> .....	66
	<i>Key issues</i> .....	66
4.2	<i>Elements of a project design</i> .....	<b>66</b>
	<i>Scope</i> .....	66
4.3	<i>Elements of organisation and management</i> .....	<b>68</b>
	<i>Scope</i> .....	68
	<i>Who is the project management?</i> .....	69
	<i>Management of people</i> .....	69
	<i>Management of information</i> .....	69
	<i>Executive management</i> .....	70
	<i>Formal arrangements</i> .....	70
4.4	<i>Financial management</i> .....	<b>74</b>
	<i>Introduction</i> .....	74
	<i>General rules for financial management</i> .....	76
	<i>Stock management</i> .....	77
4.5	<i>Construction management</i> .....	<b>77</b>
	<i>Scope</i> .....	77
	<i>Operational plan</i> .....	77
	<i>Operational management</i> .....	78
	<i>Construction monitoring</i> .....	80
	<i>Quality control and safety</i> .....	80
	<i>Purchase of materials and services</i> .....	80
	<i>Evaluation and steering</i> .....	80
<b>5.</b>	<b><i>PROJECT OPERATION AND MAINTENANCE</i></b> .....	<b>81</b>
5.1	<i>Introduction</i> .....	<b>81</b>
	<i>Overview, scope</i> .....	81
	<i>Constraints</i> .....	81
	<i>Key issues</i> .....	82
	<i>Definitions of operation and maintenance</i> .....	82
5.2	<i>Strategies and elements of operation and maintenance</i> .....	<b>83</b>
	<i>Main goals</i> .....	83
	<i>Key issues</i> .....	83
	<i>Strategies</i> .....	84
	<i>Capacity building</i> .....	86
5.3	<i>Organisation and management</i> .....	<b>87</b>
	<i>Scope</i> .....	87
	<i>Typical O+M -management systems</i> .....	88
	<i>Actors and their typical roles (O+M phase)</i> .....	88

<b>5.4</b>	<b><i>Monitoring, information/documentation and evaluation</i></b> .....	<b>91</b>
	<i>Introduction</i> .....	91
	<i>Monitoring</i> .....	91
	<i>Documentation</i> .....	91
	<i>Guidelines</i> .....	91
	<i>Evaluation of O+M on national level</i> .....	93
<b>5.5</b>	<b><i>Risks, challenges</i></b> .....	<b>93</b>
	<i>Challenges</i> .....	93
	<i>Political and administrative risks</i> .....	93
	<i>Management, market and technology</i> .....	93

## Figures

---

Figure 11:	Objectives towards project sustainability .....	34
Figure 12:	Project cycle – diagram .....	35
Figure 13:	Stakeholder profile – example from Nigeria .....	38
Figure 14:	WSKS for water supply project implementation – Example from Lesotho .....	41
Figure 15:	Development of engagements over time (village water supply programme, Cameroon) .....	42
Figure 16:	Number of people on earth, many of them facing water scarcity .....	43
Figure 17:	Steps of the feasibility study (gradual reduction of the number of options) .....	59
Figure 18:	Elements of the project agreement and basic documents .....	65
Figure 19:	Design steps .....	67
Figure 20:	Organisation and management: Fields, actors, parameters, conceptual and operational items (checklist, memory aid) .....	68
Figure 21:	Operational plan (Section 4.3 and Appendix G. 1) .....	78
Figure 22:	Operational management, sector / fieldwise (Appendix G. 2) .....	79
Figure 23:	The two maintenance strategies .....	83
Figure 24:	Different service levels/technologies, maintenance inputs and reliabilities .....	85
Figure 25:	Operation and maintenance starts with the project idea .....	87

## Tables

---

Table 1:	Possible stakeholders (Form Appendix M. 1) .....	37
Table 2:	Proposed rural water supply standards .....	45
Table 3:	Main problems and concerns for action focussing .....	47
Table 4:	Key positions of a national level strategy .....	48
Table 5:	Checklist for assessment of local context (related to water and sanitation) .....	52
Table 6:	Project objectives and related targets (Form Appendix M. 2) .....	53
Table 7:	Project organisation I – Actual situation/starting position (Form Appendix M. 3) ...	55
Table 8:	Project organisation II – Checklist for an outlook (what? - who? - when? with whom?) .....	56
Table 9:	Checklist for finding an appropriate water supply system .....	57
Table 10:	Comparison and ranking of alternatives (Form Appendix M. 4) .....	61
Table 11:	The stakeholders' responsibilities (R) and duties (D) (Form Appendix M. 5) .....	63
Table 12:	Formal arrangements – a few examples .....	71
Table 13:	Issues commonly covered in the statutes of a local water committee – an example (Form Appendix M. 6) .....	72
Table 14:	Job description for a water supply caretaker – an example for a small gravity system (Form Appendix M. 7) .....	73
Table 15:	Financial planning and financial management in infrastructure projects (Form Appendix M. 8) .....	75
Table 16:	Monitoring and rating for water supply projects – an example from Cameroon (Form Appendix M. 9) .....	92

# Part B: Project Development

This is the central part of the manual. It describes a structured and practical approach for programme and project managers in reacting to the challenges and visions formulated in part A. The respective tools are presented in part C.

## 1. PROJECT CYCLE AND ACTORS

### 1.1 Introduction

#### Context

The step-by-step preparation of a project or programme, starting with the assessment and evaluation of existing situations and conditions is as essential as the implementation phase. Efficient implementation and sustainable operation can only be achieved on the basis of proper planning. Stakeholders who will be responsible for the implementation and in particular for the later management of a project have to be involved gradually in order to develop the required capacity and sense of ownership.

This chapter is the link between the management tools (C 4) and the implementation (B 4).

Project development (Figure 12) has to consider factors such as:

- The stakeholders directly and indirectly involved, their present and future role
- Dependencies, relationships, expectations (persons, institutions, sectors and fields)
- Situations, processes, actions, changes (in the different fields/sectors; yesterday, today, tomorrow, long-term)
- Previous decisions/prejudices (existing boundary conditions).

#### Objectives for optimum project development

- A phased and **systematic project preparation**
- Negotiated and **agreed objectives and project structures** including monitoring and evaluation
- **Transparency**/information; awareness and acceptance by all partners
- Adequate degree and depth of prior discussion and preparation ensuring efficiency and effectiveness
- **Decentralisation/empowerment of users:** community-based management on the lowest possible institutional level
- Field-related objectives towards sustainable projects (Figure 11).

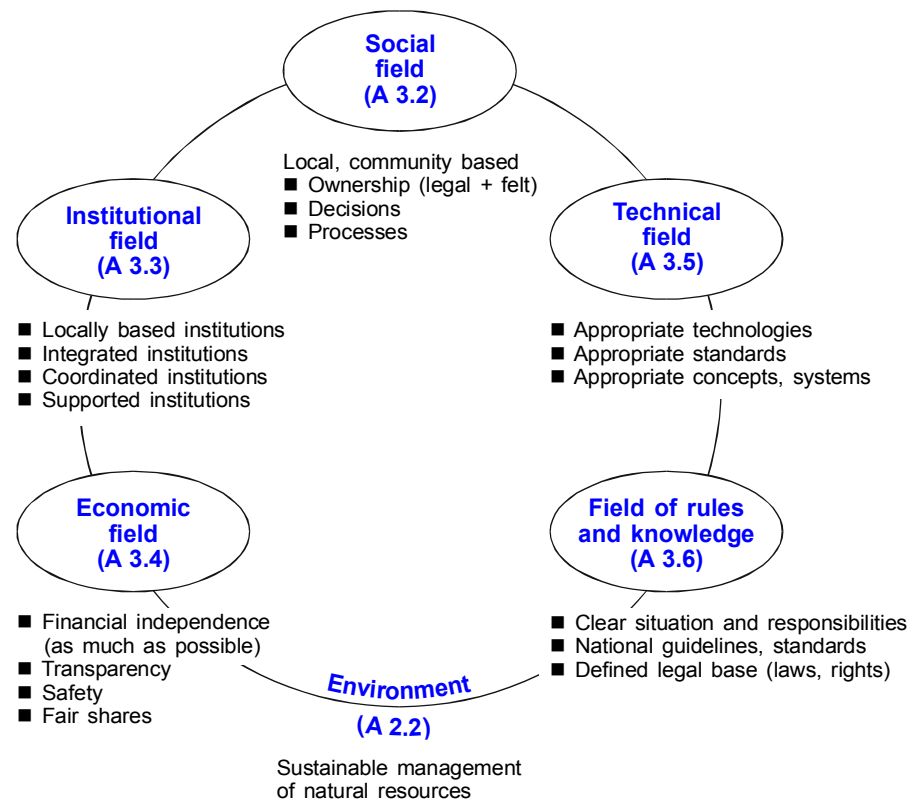


Figure 11: Objectives towards project sustainability

## 1.2 The project cycle

### Characteristics

The process described here characterises the entire project development and is based on the idea of consensus. It has to be emphasised that in consensus-type solutions nobody wins – to the extent that no one person gets all that they wanted in the end – but a greater number of people get a greater share of what they asked for.

Even small and simple programmes are *a chain of decisions and activities* which should be:

- structured (stages, milestones)
- negotiated and agreed between different stakeholders
- overseen, directed and supervised by qualified persons
- effective (objective-oriented)
- efficient (economic use of resources)
- appropriately paced (not too slow, not too fast)
- expressed in an easily understandable and transparent manner (all partners know the context, history, objectives, the present stage and the steps that will follow).



	Project items, steps	Who? Main actors	Output	Remarks (see chapter ....)
	<b>(A) Project Idea, vision</b> (incl. actors profile)	(potential) users (NGO, GO)	<ul style="list-style-type: none"> <li>Informal, spontaneous</li> <li>Visions, ideas</li> <li>Applications</li> <li>Resolutions</li> <li>Project committee</li> </ul>	(A2; 3) (1.3; 3.2; 3.4; 3.7) (C1; 5.2)
	<b>(B) Assessment of context</b> <ul style="list-style-type: none"> <li>B1) Global context</li> </ul>	Global players (international org.)	<ul style="list-style-type: none"> <li>Guidelines</li> <li>Sector orientation</li> <li>(Synergies)</li> </ul>	(A1.1; B2.1)
	<ul style="list-style-type: none"> <li>B2) National context</li> </ul>	National level authorities (GO, NGO)	<ul style="list-style-type: none"> <li>Sector report</li> </ul>	(2.2)
	<ul style="list-style-type: none"> <li>B3) Local context</li> </ul>	Users and local GO, NGO	<ul style="list-style-type: none"> <li>Local assessment (WTP, ATP, natural resources, etc.) report, interviews, questionnaires</li> </ul>	(3.2)
	<b>(C) Objectives, main strategies</b> <ul style="list-style-type: none"> <li>C1 National level</li> </ul>	As B2, plus users	<ul style="list-style-type: none"> <li>Support</li> <li>Sector objectives</li> <li>Sector policy, strategy</li> </ul>	(2.3; 2.5; 2.6)
	<ul style="list-style-type: none"> <li>C2 Local level (project)</li> </ul>	As B3	<ul style="list-style-type: none"> <li>Project objectives and targets</li> <li>Project policy</li> <li>Organization</li> </ul>	(3.3; 3.5)
	<b>(D) Evaluation of context</b> <ul style="list-style-type: none"> <li>D1 National level</li> <li>D2 Local context</li> </ul>	As B2, plus users As B3	<ul style="list-style-type: none"> <li>Sector analysis</li> <li>Evaluation report (potential and problems)</li> </ul>	(2.4) (3.4)
	<b>(E) Feasibility study</b>	NGO, local GO, users, project manager	<ul style="list-style-type: none"> <li>Feasibility study (various options)</li> <li>Recommendations</li> </ul>	(3.6)
	<b>(F) Stakeholder's responsibilities and duties</b> (Water and sanitation knowledge system WSKS)	As E	<ul style="list-style-type: none"> <li>WSKS (duties, competencies)</li> </ul>	(1.3; 3.7)
	<b>(G) Informed choice of option</b>	Users; as F	<ul style="list-style-type: none"> <li>Minutes</li> <li>Formal decision</li> <li>Agreement</li> </ul>	(3.8)
	<b>(H) Design</b> <ul style="list-style-type: none"> <li>Organization / Management</li> <li>Technical drawings</li> </ul>	Project engineer Project manager Project committee	<ul style="list-style-type: none"> <li>Project documentation</li> <li>Organization manual</li> </ul>	(4.2; 4.3) [Vol.2; 8.2] • Flow diagrams • Design procedure
	<b>(J) Final decision</b> (Yes / No)	Users + donors + GO	<ul style="list-style-type: none"> <li>Minutes</li> <li>Agreement</li> </ul>	(3.8; 4.2)
	<b>(K) Implementation / construction</b>	As H	<ul style="list-style-type: none"> <li>Structures, buildings</li> <li>Programmes</li> <li>Reports, plans</li> </ul>	(4.3 – 4.5)
<b>(L) Final inspection / commissioning</b>	As H	<ul style="list-style-type: none"> <li>Final documentation</li> <li>Guarantee</li> <li>User instruction</li> </ul>	(3.5; 3.8; 4.3)	
<b>(M) Operation and maintenance</b> (including follow up)	Users, project committees	<ul style="list-style-type: none"> <li>Monitoring / reporting</li> <li>Reliable services</li> </ul>	(5)	

Figure 12: Project cycle - diagram (Form Appendix M. 11)

**Explanation of Figure 12: Project cycle**

Such diagrams can serve as general checklists for project managers. However, they need adaptation to the specific project situation, depending on the size and complexity of the task. *The diagram shows how many steps are necessary before the construction of a water scheme can start.* The steps should be worked out and accomplished through an iterative process. Once a step takes a clearer shape, related items may need to be adjusted or optimised. There are also cases where future positions must be defined before a particular decision (e.g. point G) can be taken. Therefore the project process is accompanied and steered by a continuous monitoring-evaluation-planning-implementation cycle (MEPI).

Such project development diagrams can be used for new infrastructure projects (water supply, latrines, and roads), for extensions and also for maintenance programmes. A careful, logical and participative project evolution contributes to sustainability by promoting the commitment of the partners and by the development of local management capacities. The individual steps are described in the following pages. The respective chapters are indicated in the right-hand column of Figure 12.

### ***Project visions***

***The development of a project idea*** (Item A in Figure 12) ***should be done by the community itself***. Outsiders can facilitate awareness creation and discussion of problems or expressed needs. However, the people concerned shouldn't be indoctrinated or manipulated. This first step of the project cycle is critical for the further development of the community's initiative and co-operation.

### ***Participation***

A project development process (preparation, implementation and operation) can be participatory or dictatorial. ***Experience world-wide confirms and recommends the principle of participation***, in order:

- to tap into and build up local problem solving capacities
- to achieve commitment, acceptance and a sense of ownership, all of which contribute to sustainability.

A co-operative project strategy means that all stakeholders are invited to contribute towards a consensus with regard to the applied objectives and planned activities as well as with regard to their roles, responsibilities and duties. The process of exchange of opinions and negotiations concerning vested interests should result finally in mutual understanding and consensus.

### ***Context awareness***

***A project never happens in isolation***. Consideration of the context is a basic condition for success and sustainability (Figure 11). Since the context of a project can change rapidly it needs to be monitored and evaluated throughout the course of the project in order to allow for adaptation where and when necessary.

### ***Flexibility***

***Neither the objectives nor the strategy of a project should be assumed stable*** or taken for granted during the course of a project. Therefore structure, relevance and viability require continuous reassessment.

## ***1.3 The stakeholders and their involvement***

---

### ***Identification of stakeholders***

Who are or should be the direct and the indirect actors in a programme or project? Who is concerned actively or passively, positively or negatively?

In an initial step all possible actors, people and institutions, formal and informal groups, etc. are listed (Table 1). This can be done partly through public meetings. In this early phase we want to find out who could contribute at what stage and

in what way. It is also important to find out who influences a project positively or negatively. In a second step their relationship is evaluated (WSKS-tool in C 2).

Figure 13 gives an example of a stakeholder profile for a water supply project in Nigeria. In rural projects, relevant partners and actors will be concentrated at the local level, while for national level policy makers all levels, including the international dimension, can be important. Particularly in the case of conceptual work or in dealing with key issues, it can be necessary and helpful to negotiate in the international network of water and sanitation partners (Appendix C). However, small projects also need a sound foundation within regional and national structures and a clear organisational structure (technical support, project management, training, financial assistance, exchange of experiences, regional co-ordination, etc.).

	Description	formal	informal	obligatory	optional	Functions, influences, effects
<u>Local</u> (Village, community)						
<u>Regional</u> (Watershed, district, .....)						
<u>External (beyond)</u> (province, nat. government, nat. NGO, foreign NGO, donor)						

Table 1: Possible stakeholders (Form Appendix M. 1)

Government structures (relevant to water and sanitation)					
Level	Leaders		Admin. authority / Sector services	Remarks	Links
	administrative	traditional			
A Federal level	President		Minister / ministries	Policies Strategies	Universities Research institutes International exchg.
B State level	Governor	Emir ("Super chief")	Director / ministerial departments	Executing bodies	Universities Sector boards
C Local Government (area)	Chairman		Sector committee / local government secretariat	Implementation Authorization for projects	Sector committee (e.g. WATSAN)
D District	District head		District head / district head office	Animators Promoters	
E Ward (10 - 30 villages)	Ward head			Coordination of projects	
F Village	Village head chief	Village chief (paramt. chief.)		Project holders	Council of elders Interest groups

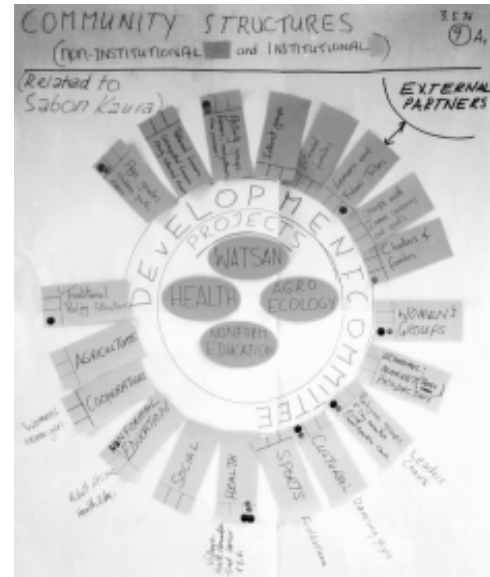


Figure 13: Stakeholder profile – example from Nigeria

**Stakeholders, their typical roles and relationship**

In A 3.2 and A 3.3, social and institutional principles are described which underline the relevance of participation, partnership and co-operation. Some of the partners have particular functions and roles to play:

- ownership
- management

**The Community/Local committees/Users**

In general it is preferable when **organisations at user level are directly involved in project management** (village, sub-village divisions, neighbourhoods). Specific **water committees or water boards** for community water supply may represent the beneficiary community most efficiently because water and sanitation is their concern. Balanced representation of all social groups including women brings to the project the full benefits of local authority and expertise. Although in some cases, for religious or cultural reasons women's direct contributions can not yet be taken for granted, the advancement of women remains an important development goal. The growing number of female-headed households in developing countries gives added urgency to this issue.

There is a danger that **the water committee may be in conflict with other decision making structures inside or outside the community**, or that it may involve only the elite of the village and so antagonise the rest. Should committees include existing leadership? Their authority and support will usually be needed, but **local elites should not dominate or monopolise a project or a water committee**. In cases of potential conflicts it may be possible to involve traditional or political leaders as honorary members only. A tried and tested rule says that each committee should select direct representatives to the respective bodies on the next higher hierarchical level. Persons serving on committees must be qualified and respected persons.

If a project is very large, or when it covers more than one village, it may be advisable to form branch committees as well. Experience has shown that it is advisable to have tap (standpipe) or well committees. They look after the upkeep of

hygiene around the tap or the well, and carry out basic maintenance and small repairs. They may also collect water rates. Because these committees are close to the users they should also be represented in the higher level local management. Their knowledge about family size and composition, water use and payment capacity is useful for the working out of more equitable rate payment systems. They can also play a valuable role in the two-way communication between the users and the committee.

### ***The Government***

- facilitation
- control
- co-ordination

***Government has a vital part to play in*** the direct and indirect promotion of community capacities and through its sustainable control over policies, standards and natural resources. The most important role for government in the water and sanitation sector is a facilitating one, ***creating an 'enabling environment'*** (incentives, subsidies, supportive legislation/policy standards and professional consultancy). The government needs to retain important powers and responsibilities for itself, even in decentralised water and sanitation programmes and under optimal community management conditions. Government must also ensure that a community's or user group's freedom of action does not impair the corresponding freedom of others.

In some cases local councils or other low-level institutions of administration are responsible for maintenance, administration and financing of recurrent costs. Although they often have the formal authority to collect community contributions, there are several factors which can endanger their effectiveness:

- Local councils may be established at a level above the community (physical and social distance)
- Local councils have too many other tasks (competition for time and budgets)
- There may be insufficient or inappropriate technical or logistical support from the government
- There is a danger that the population may be under-represented, or a risk of corruption, etc.

### ***The private sector***

- consultancy
- execution
- management

***Flexibility, accountability and efficiency are said to be key attributes of the private sector.*** Local management of water systems can be a stimulus for the private sector. Communities may hire contractors to help construct their water systems. Users' direct influence on the selection and guidance of contractors contributes significantly to the community's empowerment and to sustainable management. Hiring local mechanics can be a cost-effective way of ensuring timely maintenance, particularly where their services are shared among several communities. However, the engagement of local contractors, mechanics or other craftsmen for implementation, maintenance and repair works needs careful definition of contracts, management and supervision. Paying per repair, for example, may discourage preventive maintenance and lead to shoddy work. It may be better to apply a part-time salary for specific duties, including both scheduled maintenance and emergency repairs. The committees and other responsible authorities need adequate training and guidelines enabling them to supervise the private sector's involvement. It is a particular challenge to combine community participation with activities of the private sector. ***Clear agreements about task sharing and time schedules, including a regular reporting and optimal management system, are indispensable.***

- facilitation
- management
- follow-up

### NGOs

National and international NGOs have a justified reputation for successfully *working at grassroots level. They can play a bridging role between governments and donors and communities.* National NGO networks can help to increase the outreach capacity of government agencies. As supporters of community-managed water and sanitation projects, NGOs have a good track record, especially on software issues. They have important roles to play in piloting innovative approaches and in supporting community based management of services. Governments can encourage and develop partnerships with NGOs in an overall sector development programme. However, NGOs are often limited in their management capacity and professionalism. This is one of the reasons why their involvement should not allow or promote a gradual ousting or substitution of the government or private sector.

### Water and sanitation knowledge system (WSKS)

When the stakeholder list (Table 1) is drawn up, *the relationships, links and dependencies as well as hierarchy issues and the flow of information, money, etc. should be discussed, structured and visualised in a participatory process.* This can be done with the help of the WSKS tool (C 2 and Appendix E).

It is advisable to develop individual WSKS diagrams or tables for different project phases and content:

- planning phase
- implementation
- O+M-phase
- information
- flow of funds
- responsibilities, hierarchy.

Figure 14 is an example of a WSKS for the implementation of water projects in Lesotho.

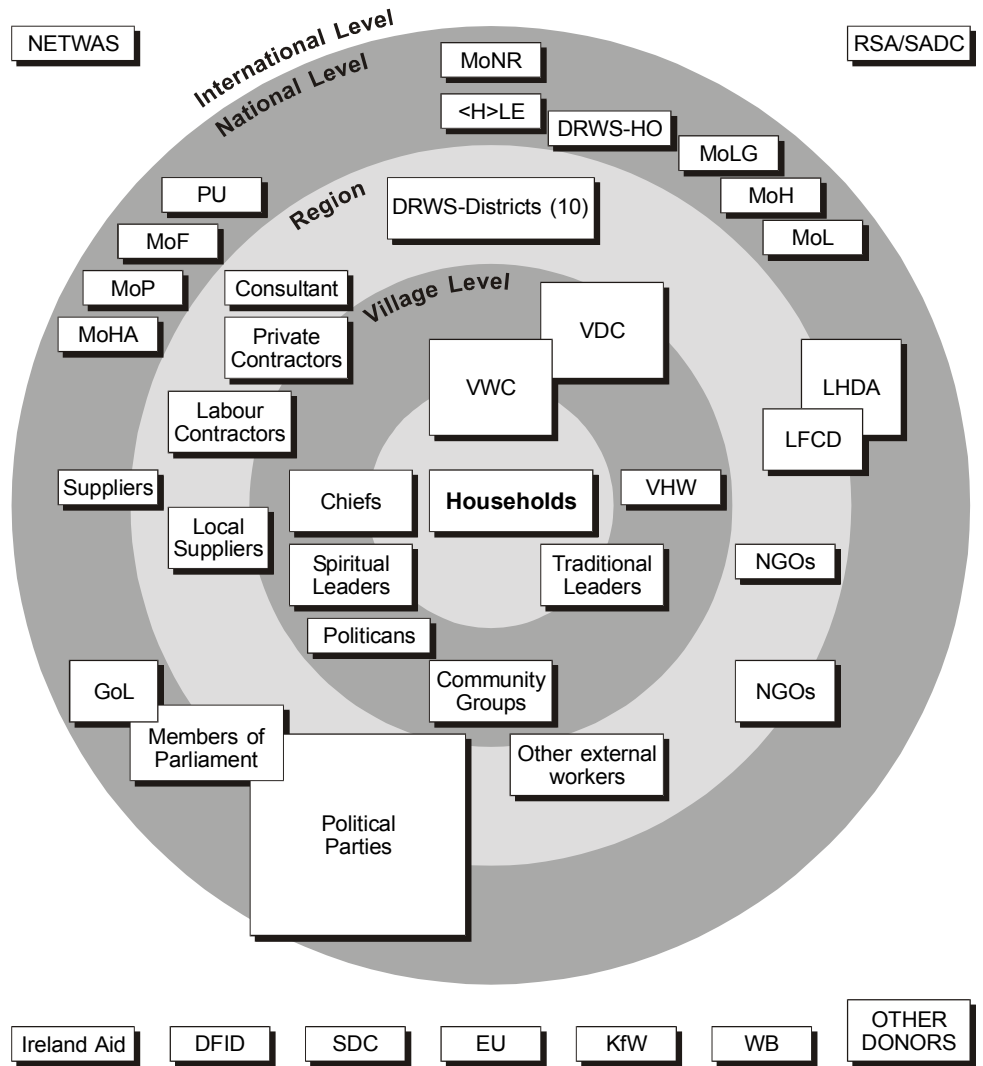


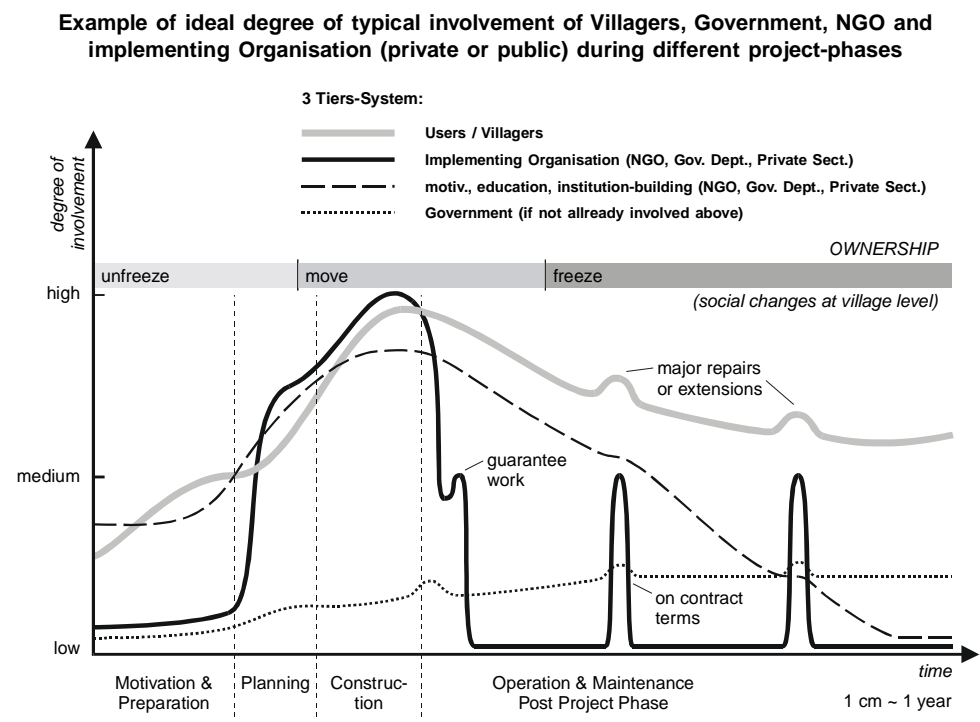
Figure 14: WSKS for water supply project implementation - Example from Lesotho [29]

**Gradual empowerment of management bodies for O+M**

It is advantageous when the initial structure for decision making and project management is the same as that which is expected to be in place for the O+M phase, so that institutions and persons in charge have the opportunity to be empowered and trained during the realisation of a project. Supportive actors who may be needed temporarily should only act as facilitators and trainers.

**Varying degrees of involvement**

The involvement of each partner over time is not constant. *Depending on the project phase and on the nature of a programme the involvement of a specific actor develops and fluctuates (Figure 15).* A local sense of ownership leads to a high degree of community commitment not only during the preparation and implementation phases. It should be discussed with and accepted by the project holder community that any initially high assistance from abroad, from government or elsewhere must gradually be reduced over time.



**Figure 15:** *Development of engagements over time (village water supply programme, Cameroon)*

## 2. BEYOND THE PROJECT – THE NATIONAL CONTEXT

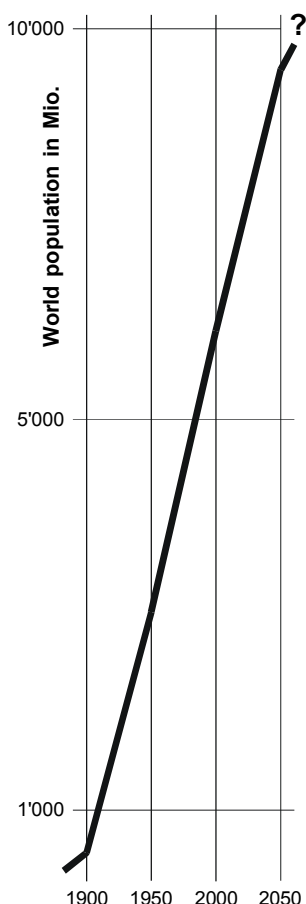
### 2.1 Introduction

**Overview**

A water and sanitation sector policy (goals and development plans) should exist or be developed. Communities, programme and project managers should have the opportunity to work on the basis of *appropriate, clear and realistic guidelines and standards: technologies, service levels, institutional and organisational set-ups, finances.* Water resource management and human resource development (HRD), including training, are other fields that require a concept at, and support from, national level. Village projects and programmes need also to be integrated in a higher context (institutionally, geographically, ecologically), because they usually depend on external support from government and external support agencies (ESAs). *Integration in the higher context is a condition for an equitable consideration of the interests of neighbours and the sharing of limited resources.* It facilitates the prevention or management of conflicts.



### The global context



The assessment (Section 2.2) and the evaluation (Section 2.4) of the national/superior context and the formulation of recommendations are tasks for interdisciplinary and inter-institutional working groups, in which all interested parties, including users, must be represented.

National situations are related to the international and worldwide context. 'Less water for more people' is a global challenge. A simple trend graph shows dramatically why water is the most endangered and over-utilised natural resource (Figure 16).

**Growing pressure on water resources could increasingly become a cause of international conflicts.** Various world events and programmes have tried to influence the direction of water management towards peaceful resolutions: milestones are the UN Conference on the Human Environment (Stockholm, 1972); the International Drinking Water Supply and Sanitation Decade launch (Mar del Plata, 1977); the World Conference on Water and the Environment (Dublin, 1992); the UNCED Earth Summit - Agenda 21 (Rio de Janeiro, 1992); the Drinking Water and Environmental Sanitation Conference on the Implementation of Agenda 21 (Noordwijk, Meeting of Ministers, 1994); the Global Water Partnership meeting (Stockholm, 1996); the Fourth Global Forum of the Water Supply and Sanitation Collaborative Council (Manila, 1997); and the First World Water Forum of the World Water Council (Marrakesh, 1997).

Figure 16:

*Number of people on earth, many of them facing water scarcity*

### Access to water is a basic human right

International strategies and guidelines can stimulate national institutions and policy makers towards finding appropriate measures for water supply. The international community on the other hand can learn from the water policies of individual countries. **South Africa, for instance, has developed a White Paper on a National Water Policy.** In the preamble we can read: 'The dictionary describes water as colourless, tasteless and odourless - its most important property being its ability to dissolve other substances. We in South Africa do not see water that way. For us water is a basic human right, the origin of all things - the giver of life'.

Appendix I summarises the document **'Fundamental Principles and Objectives for a new Water Law for South Africa'**. The section headings are: **legal aspects of water; the water cycle; water resource management priorities and approaches; water institutions; water services.** The 28 principles of this South African document could lead to fair and peaceful resolutions of water problems on all levels and in all situations.

The Sector Policy on Water Supply and Sanitation, formulated by the Swiss Development Co-operation (SDC) is another strategy paper showing a structured approach facilitating the formulation of sustainable water policies and the finding of solutions in planning, implementation and evaluation of programmes and projects [28].

## 2.2 Assessment of the national context

(Item B 2 in Figure 12)

### **National and regional sector policy**

The role of partners from outside the community, e.g., of the government is mentioned under institutional set-up. How far are local activities on water and sanitation developed and influenced from outside institutions, from above, from beyond (from government, NGOs, ESAs, private sector, etc.)? What policies exist and how far is water and sanitation a topic of planning and assistance on national and regional levels (sector plans)? Is there any co-operation at the international level?

### **Boundary conditions**

How effective (supportive or hindering), how sector-relevant are existing structures, activities and policies? It is necessary for project managers to assess the wider political, administrative, legal, social, cultural, economic and ecological contexts.

### **Partner profile**

Based on the partner profile, developed perhaps according to the WSKS-model (Section 1.3; C 2; Appendix E), **the 'usefulness' of institutions and structures and the success of their promotional activities should be assessed.** To identify the developments and the actual situation the SWPO method (Appendix F. 2) could be a suitable tool.

### **The water and sanitation situation**

In this inventory phase the water and sanitation situation on a national level should be assessed and described (developments over time and trends) for the rural, urban and semi-urban contexts. Geographical, socio-economic, technical, managerial and ethnic differences may also be considered. Main topics and factors are:

- Water household and water cycle (availability, quantity and quality)
- Watershed/ecology (soil, plants, water)
- Supply standards (quantity, quality, service levels)
- Water supply coverage
- Coverage with sanitation facilities
- Technologies, reliability of services, structures and buildings.

Much of the information acquired during this phase should derive from the national sector policy, institutional monitoring reports, annual sector reports, etc. During the assessment work there might also appear gaps where certain aspects are unclear or undefined. Such shortcomings should be listed in order to be considered under Section 2.5 and Section 2.6.

### **Sector relevant changes**

The assessment of the national level context should also include a listing and description of sector-relevant changes which are likely to be established or to come:

- National political development in the various sectors (territorial administration changes, infrastructure policy, labour regulations, decentralisation, democratisation, etc.)
- Increased urban-rural interfaces including migration
- Population growth and increased water demand (domestic, agricultural, industrial)
- Ecological changes (degradation of soils, vegetation, groundwater, etc.)
- Changes in government and donor funding capacity
- Integration of water sector into the local economy.

## 2.3 National standards of water supply and sanitation projects

(Item C 1 in Figure 12)

Sector planning starts with the definition of the sectoral aim and objectives followed by the development of an appropriate policy and strategy. The objectives for water and sanitation may already have been defined. However, the aim is to verify, to revise and to update existing objectives. The need for revision can become obvious through the steps under [Section 2.2](#). It can also be based on and emerge from international experience and political declarations like the Rio Agenda 21. Finally, standards and policies need a legal basis ([Section 2.6](#)).

### Main objectives of national standards

- Aiming at the **improvement of health status, well being and development of the entire population through the provision of safe drinking water and sanitation** to the urban and rural populations. Recognised standards (quantity, quality, and proximity) should be applied.
- **Standards and objectives should be defined as much as possible quantitatively and objectively; they must be measurable.** The requirements of the users are of the highest importance.
- As an example Table 2 shows a list of selected common water supply standards (basic needs) that should animate policy makers to discuss and set appropriate standards for their own situation. Detailed technical standards are given in the Engineering Manual [Vol. 2].

Parameters	Standards, targets		Remarks
	short-term (5 years)	long-term (25 years)	
Specific daily water quantity for human consumption (l/head) from public standpipes:			
■ for a minimum of 10 months each year	30	40	
■ for a maximum of two months each year	15	20	
Supply standards in rural areas in % of population with access to:			
■ Private connections, yard taps	10	30	} 100%
■ Public taps, wells	70	60	
■ No service	20	10	
■ Collection distance < 200 m	30	40	} 100% of population (Depends on the density of houses)
■ Collection distance 200 - 500 m	40	50	
■ Collection distance > 500 m	30	10	
Financing of investments (cash and in-kind) in % of the total costs:			
■ local contribution *	30	35	} 100%
■ Government contribution	20	35	
■ foreign aid	50	30	
Financing of operation and maintenance in % of total O&M-cost:			
■ local contribution *	60	70	} 100%
■ Government contribution	40	30	
■ foreign aid	0	0	
* Subsidiary systems in communities: balancing gaps between poor and rich families			

Table 2:

### Proposed rural water supply standards

Standards for sanitation or other development sectors should be similarly formulated.

## 2.4 Evaluation of the national context

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(Item D 1 in Figure 12)

### **Successes and problems in the various fields**

To what extent is the national context compatible with and of assistance to the realisation of the goals defined in [Section 2.3](#). Where and to what degree do national structures deliver what is expected of them? What are the shortcomings? ***The evaluation should provide a clear and structured picture of the objective-related national and local coverage and achievements and about policies, programmes and trends in the fields of:***

- Legislation, including water resource management
- Sector development, including coverage
- Technology, including standards, link to O+M
- Ecology (bio-diversity, stability, degradation)
- Institutional development, including roles and responsibilities
- Political and social structures (e.g. decentralisation)
- Economy and finances (e.g. government budget, donor funds)
- Human resources and institutional development (local knowledge, professional training and institution building)
- Private sector and NGO capacities and support programmes
- Institutional and sectoral co-ordination/co-operation.

### **Prioritisation of problems**

The evaluation of the wider context should also identify the relevance of each broader issue to the project goals, and should consider the degree to which these issues can be influenced at project level. ***It is important for management bodies to concentrate resources and effort where problems and conditions can really be influenced, changed or improved (C 1.3, Figure 28)***. Dependencies, potential, interrelations and risks should be estimated. In this stage the most realistic and promising spheres of intervention need to be identified. The relevance of problems should be prioritised. The strategy matrix (Table 3) gives an idea about problems and concerns for action focussing.

Referring to, and based on, the evaluation of the context the reality and appropriateness of the standards to be applied ([Section 2.3](#)) need to be crosschecked and revised if necessary.

Problems and concerns	Social Field	Institutional Field	Economic Field	Technological Field	Rules, Regulations, Knowledge	Ecological Field	Law, Policy (National level)	Remarks																		
1. Only a few families own land	↔		↔		⊖ (A) i	↔	Legal land allocation	Political campaign																		
2. Ownership of water supply is not defined		↔			- A		Water policy	Communities should own water supply																		
3. Water quality standards do not exist	↔	↔	↔	- (A) Technical standards	- (A)		Water policy	- Proper intakes - Selective treatment																		
4. No watershed management	↔	↔	↔ Compensation		↔	⊖ ∇ A Guidelines for land + water use	Law for environment protection	- Ecological farming - Taboo zones																		
5. Empowerment of local project committees		(P) (A) Legal status			P (A) Training progr. for function holders		Law for local administration	} - Training of trainers - Human resource development and institution building																		
6. Empowerment of users	P A				P A Conscientisation programmes																					
7. Inadequate coverage.			- (A) Financial allocations	- (A) Standards, objectives			Water policy Finance plan																			
etc.																										
<table border="0"> <tr> <td>↔</td> <td>Dependency, influence</td> <td>-</td> <td>Hindering factor (negative)</td> <td>A</td> <td>Action to be taken</td> </tr> <tr> <td>∇</td> <td>Risk</td> <td>+</td> <td>Promoting factor</td> <td>i</td> <td>High influencability</td> </tr> <tr> <td>P</td> <td>Potential</td> <td>○</td> <td>Significant, important</td> <td></td> <td></td> </tr> </table>									↔	Dependency, influence	-	Hindering factor (negative)	A	Action to be taken	∇	Risk	+	Promoting factor	i	High influencability	P	Potential	○	Significant, important		
↔	Dependency, influence	-	Hindering factor (negative)	A	Action to be taken																					
∇	Risk	+	Promoting factor	i	High influencability																					
P	Potential	○	Significant, important																							

Table 3: Main problems and concerns for action focussing

### 2.5 National level policy - Programme Strategy

(Item C 1 in Figure 12)

**Governments should act as the custodians of the nation's water resources (public trust).** Section 2.4 indicates what the global or national challenges are and the extent to which objectives are not realised due to higher level deficiencies. How can these problems be faced? What kind of new, additional tools, structures and means are necessary or how must the existing ones be improved in order that a national water policy can fulfil its supportive role towards sustainable local projects in the water and sanitation sector? The Department for Rural Water Supply in Lesotho for example has taken the initiative to develop a new programme strategy taking into consideration the latest global learning. The process is about to be documented and will be available from SKAT.

## **Democratic development of strategies**

The policy and the national programme strategy must refer to the objectives and standards under [Section 2.3](#). In comprehensive, interdisciplinary and democratic discussions, alternative policies and strategies should be evaluated in order to develop an optimum strategy which assures the efficient and effective realisation of sector targets. The policy and the programme strategy should provide optimum support, enabling the local project holders (communities, mainly) and managers to realise the sector goals in a self-reliant and competent way. What such a national or overall strategy might contain is detailed in Table 4.

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### ***Development and enforcement of a national water and sanitation policy*** (legal framework, guidelines and strategies):

- Evaluation of existing policies and strategies ([Section 2.5](#) and [Section 2.6](#))
- Objectives and supply standards
- Technical standards ([Section 2.3](#) and Vol. 2)
- Resources, supervision and management, priorities for allocation
- Watershed and river basin management
- Environmental protection
- Water price policy
- Targets for increasing coverage (regions, villages)
- National and provincial concepts and structures including institution building and human resource development
- Inter-sectoral and inter-institutional (national and foreign) co-ordination and exchange of experience
- Donor assistance, co-ordination among external donors and supporters.

### ***Considerations in planning local projects:***

- Technologies, standards, financing and pricing of services
  - Community based and participative management, administration and accounting
  - Structures and programmes for the co-ordinated support of local government services, communities, institutions, NGOs, private sector
  - Training programmes, information
  - Conciliation and mediation (conflicts, diverging interests between villages, regions).
- 

**Table 4:**

### ***Key positions of a national level strategy***

For each key position the national strategy must be discussed, formulated, applied and enforced. However, in many cases this policy work takes too much time and projects and their managers cannot wait until all policy matters are resolved. Therefore, it can be necessary to make realistic assumptions for better and fair policies which might follow later.

The formulation of a policy-based project strategy (activities and decisions towards specific objectives) with milestones and scheduling is not sufficient in itself. Frequent contacts with national policy makers and pressure from the lower levels are necessary, too. Appendix H shows part of the support strategy for a project in Lesotho.

## 2.6 Legal basis

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### *From hindering to supportive laws*

**Legal principles can ensure respect for common and individual interests and rights regarding access to water.** A legal basis is also necessary to defend the rights of future generations and of nature itself (sustainable life conditions). In many countries existing policies or legislation do not yet acknowledge sufficiently the priority of public interest in water supply. **All water in the natural cycle (on the surface, under the ground and in the air) should be declared a common resource.** Water rights should not be given permanently and they should no longer be tied to the ownership of riparian land.

Sometimes national laws do not allow the introduction of community management. In other cases, there may be a long-standing custom (traditional law) that water is a free good. Water supply projects can be exploited for political gain by local politicians, with the danger that projects may be based on political rather than community needs.

**Laws and contracts are required to ensure the sustainable and fair management and allocation of water,** to define the linkages between central government and decentralised agencies and to promote financial autonomy and accountability in local institutions. **The application of laws should be strict, fair and transparent.** Offences must incur sanctions. Where the enforcement of laws is arbitrary, people are apprehensive and unwilling to co-operate within legal frameworks. Without a good and confidence-building legal basis people and institutions are either unable or unprepared to act in a sustainable manner. A farm family, for instance, will not be concerned about water source and soil protection measures at all, if land ownership or right of use is not guaranteed well into the future.

### *Existing legal framework*

Before undertaking policy work on any level it is essential to research and evaluate the existing legal provisions in the sectors of water, sanitation, health, environment, land (ownership, use), institutions (organisations), tariffs, etc.

- What rules already exist and how comprehensively are they enforced?
- Are they suited to different user groups and sectors?
- Are the existing rules known to those to whom they apply?
- How effectively is the sector strategy integrated into the legal system?
- Is there mismanagement, injustice, uncertainty, etc.?
- What legal definitions and rules are lacking, what laws need change or amendment?

Such questions need to be discussed in working groups with the participation of all concerned. Where territorial administration and natural units (river basins, watersheds) correspond to water supply management areas, inter-sectoral co-ordination and co-operation are easier than in cases where these areas do not coincide. Corresponding geographical and political units would help to minimise legal conflicts but, at the very least, transparent area-based co-ordination must be assured.

**Traditional rights**

New rules about protection and allocation of water or land can be based on or developed from traditional rules. **Modern laws should not contradict recognised and appropriate traditional law.** The question of ownership of structures has to be decided separately from the question of ownership of the water itself. In most areas water is a public good and no individuals can claim ownership of it - in traditional and modern societies water is seen as a gift and a public good. On the other hand technical structures need to be under a defined ownership. If users and owners are identical, the conditions for sustainable maintenance are ideal.

**Legal principles**

In many (perhaps most) cases, suitable legislation develops slowly and project strategies cannot wait for it. However, project policies and concepts should foresee that appropriate legal rules will eventually be developed. Adequate project concepts, practical experience and recommendations from the grassroots level can influence higher legislation in a constructive and positive way.

Appendix I gives a series of principles which were recommended by an interdisciplinary working group for rural and urban South Africa. These recommendations are of general validity and can therefore serve as a checklist for the creation of water laws and policies everywhere.

**Financial principle**

**Legally sanctioned guidelines for financing and pricing** are an essential part of the national sector policy and a condition for community based management. Realistic models should be developed and implemented, based on local capacities and legal and socio-economic structures and programmes.

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### 3. PROJECT PREPARATION

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#### 3.1 Introduction

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**Overview/objectives**

In Chapter 2, the broader context of a project was described. This chapter considers the local context and requirements at project level. The aim of participatory project preparation is to generate and provide a comprehensive guide for planning and implementation (Figure 12). **An ideal, participation-based preparation process leads to a high degree of commitment and sense of ownership in the user community.** Relevant management and planning tools are introduced in C 4 and C 5.

In a first step the local context related to the water and sanitation situation has to be appraised. This includes identifying and analysing problems, needs and potentials (driving and hindering forces). On the basis of these facts and considering the broader project context (Section 2.4; Section 2.5) the objectives and targets of the project are formulated (C 2 in Figure 12).

In the next step the feasibility of various project options can be studied and compared (E in Figure 12). The technically recommended solution(s) are to be evaluated in order to find out the most appropriate option which will be supported actively by the entire community and which is the most promising from the point of view of sustainability (G in Figure 12).



### 3.2 *Appraisal of the local context (socio-economic survey)*

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(Item B 3 in Figure 12)

#### *Introduction*

***Any development project risks failure if it is not embedded into the local context.*** The people's way of life, their view of things, the natural and economic potential require consideration. The appraisal and the evaluation of the local context and the definition of project objectives (Section 3.2, Section 3.3 and Section 3.4) are not isolated steps. They must be developed simultaneously in a kind of iterative process.

Many results from Chapter 2 may already represent and describe aspects of local situations. However, factors that are not yet covered need to be assessed separately for a specific project or for a group of projects in an area.

At this initial conceptual stage, the project structure should be initiated, a local committee founded and contacts with potential external support agencies made. If this happens, the assessment of the local context is done by the local people and authorities, together with an external support body.

At this stage it would be advisable to employ a qualified water engineer or technician who is experienced in all aspects of water project management, sanitation and ecology. Such a specialised person (or team) can help to ensure the proper consideration of the local context as part of the feasibility study (Section 3.6).

#### *Main aspects of the assessment*

***Main aspects of the assessment, which also considers past development and trends:***

- present situation in the water and sanitation sector
- successes, failures, deficiencies, constraints
- indications of successes and problems
- causes of obstacles
- existing problem solving capacity
- economy (village, household) - (C 7.2 and C 7.3)
- social and political situation
- institutions
- ecology.

The SWPO method and/or PRA (C 5.2) are suitable tools for defining and structuring contributions and outputs. They also ensure that the various opinions can be expressed and considered in a participatory way. It is important to make sure that the social environment (A 3.2) is considered in a way that all groups and individuals concerned feel free and invited to give their contributions. Transparency and a good information policy facilitate the assessment of the local context. Table 5 is an incomplete checklist that can help to identify the relevant parameters. A detailed socio-economic questionnaire, such as that used in Cameroon's Community Development Department (Appendix L) could be useful in other situations.

***The results should be put down in a final report, which is accepted and supported by all the partners.*** Unanswered or unresolved questions should also be listed in this report.

**Potentials and constraints in water and sanitation**

yesterday (history) - today - tomorrow (trends)

Avoid duplications with chapter 2 (National context)

**0. GENERAL**

- Village history – What has been the experience of the villagers to date?
- What kind of information is available from departments, sector institutions (water, infrastructure, health, education, etc.)?
- Health conditions, demography.
- Is the project area (village(s)) representative of the entire region?
- Other development projects planned, realised, experience with these.

**1. SOCIAL FIELD**

- Social groups
  - Social traditions
  - Social organisations and their opinions
  - Population; women/men/children/gender situation
  - Minorities
  - Conflicts (individuals, interest groups)
  - Traditional power, opinion leadership
  - Understanding of WATSAN; motivation
  - Demands for change
- } their organisation, their goals, their engagement, capacities, etc.

**2. INSTITUTIONAL FIELD**

- Institutions in general
  - Development institutions
  - Inter-institutional relations/co-ordination
    - horizontal
    - vertical
  - Local management capacity
  - Capacity of private sector
- } local/external, supporting

**3. ECONOMIC FIELD**

- Local economy
  - household economy
  - Links water/economy
  - Ability and willingness to pay
  - Tariff structure
  - Availability of technical material
- } Production, market, income/ expenditures

**4. TECHNOLOGICAL FIELD**

- Historic and existing WATSAN situation
- Technologies applied
- Supply standards (quantity, quality, walking distances, tap standards)
- Allocation policy for water
- Maintenance, experience
- Reliability of services
- Deficiencies, problems

**5. RULES, KNOWLEDGE**

- Traditional skills, knowledge
- Modern skills, knowledge
- Legal situation (water, land)
- Political situation
- Distribution of relevant knowledge and documentation among people and institutions

**6. ECOLOGY, NATURE** (monitoring over previous years?)

- Water household (resources, quality)
- Soil degradation/conservation
- Plant cover
- Construction materials (mineral and biological resources)

**Table 5:****Checklist for assessment of local context  
(related to water and sanitation)**

### 3.3 Project objectives and related targets

(Item C 2 in Figure 12)

The main objectives should have already been defined on a national level (Section 2.3, Table 2). However, their appropriateness and local applicability need confirmation. Differences to proposed national standards must be discussed and decided here. Together with the future users the specific objectives and targets are negotiated and defined one by one. Throughout this process the issue concerning appropriate standards plays a key role: What is necessary, desired, affordable and manageable over time? It is important to define objectives that meet the requirements of the different stakeholders.

Table 6 gives an idea of how project related objectives and targets can be recorded. Such a list can guide the evaluation of the local context (Section 3.4). Detailed technical targets and design figures are given in the Engineering Manual [Vol. 2] When all objectives and targets are defined they need to be reconsidered in an integrated check because sometimes an aspect which seems individually sound does not fit in a series of others.

No.	Items, parameters	Targets, objectives		Remarks
		short-term (5 years)	long-term (25 years)	
1	<u>Demand-related items</u> - Population to be served (number) ..... - Institutions ..... - Irrigation / farming ..... - Animals ..... - Other activities ..... - .....	.....	.....	
2	<u>Local financing capacity / objectives</u> - Investment (%) ..... • population ..... • local institutions ..... • local government ..... - Running costs (%) ..... • population ..... • local institutions ..... • local government ..... - Proposed water tariff structure ..... .....	.....	.....	
3	<u>Organizational / institutional objectives</u> - Ownership ..... - Supervision ..... - Management ..... - Operation + maintenance ..... - Follow-up ..... - .....	.....	.....	
4	<u>Ecological objectives / targets</u> - Watershed management ..... - Spring protection ..... - .....	.....	.....	
5	<u>Proposed modification of standards defined in Table 2</u> - ..... - .....	.....	.....	
6	<u>Other objectives</u> - ..... - .....	.....	.....	

Table 6:

Project objectives and related targets (Form Appendix M. 2)

### 3.4 The evaluation of the local context

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(Item D 2 in Figure 12)

#### **Sustainability criteria**

This item needs to be based on sound understanding and acceptance of basic principles (A 3), e.g. sustainability criteria. After completing the initial planning steps, one can expect that the local context and the tools for participatory planning are understood and accepted by all partners and stakeholders.

#### **Dialogue among local and external stakeholders**

At this point, a participatory evaluation is to be carried out regarding the assessment (Section 3.2) and the project objectives (Section 3.3). This period of dialogue is critical in terms of the awareness and empowerment of the local community (leadership promotion and preparedness creation for capacity building). The purpose is not only to find out the reasons for past failures and successes, but also to gather comprehensive qualitative and quantitative information about these issues. The different views and opinions of particular groups (consumers, government, local leaders, men, women, older people, outsiders, disadvantaged or marginalised groups, neighbouring villages, etc.) should be investigated and discussed. **This analysis helps the partners to define and to present the achievements and gaps regarding the sector objectives and the desired/required changes.** Here, also, it is advisable to do the analysis on the basis of the various fields already mentioned (social, economic, rules, knowledge, etc.). A problem matrix as shown in Table 3 could serve as an idea for short and clear presentation. Some unanswered questions from the assessment (Section 3.2) might be answered here. Remaining questions must be brought forward. Goal-relevance and influenceability need to be considered in the same way as in the evolution of the national context (Section 2.4). Based on the concluding report about the local context evaluation the appropriateness of the previously formulated objectives (Section 3.3) should be checked and adapted, if necessary.

### 3.5 Project organisation

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(Item C 2 in Figure 12)

#### **Basic organisation**

(Table 7 and Table 8)

The project organisation is based on a few short documents, serving as a management resource, which describe the initial situation and the steps required to achieve the project objectives. The project organisation needs continuous or sporadic improvement and adaptation. Section 2.5 (programme strategy on national level) and Section 3.4 (evaluation of local context) are the bases and the raw material for the organisation of a project.

**Now the intentions become concrete and more intensive with regard to efforts, costs and complexity. Therefore it is necessary to draw up a clear project strategy for the planning process and for implementation.** The project cycle (Figure 12) is also a basis of the project organisation. First and most importantly the project organisation - based on the local situation - must be oriented towards the project objectives (Section 3.3). What is really needed and wanted? Making an organisational structure means also the formulation of the "project culture": processes, activities, working methods, responsibilities, potentials and required resources are reflected, discussed and decided systematically. Simple, but important questions are:

**Who does what?  
Why? How? When?**

The actors' framework has already been described under Section 1.3. What is their role in the context of the project? The project organisation is not only an overview of intended actions and decisions, but is also about targets - a mutually developed orientation framework for all stakeholders. It contributes to a better awareness of the partners and to a favourable climate of co-operation. Table 7 and Table 8 together are a checklist for a community based project organisation which can be interpreted and adapted to specific local situations. In the project organisation all relevant aspects should be covered. However, it is not yet necessary to go into detail. A short, objective and structured description of the actual situation and the project objectives (Table 7) is the basis for the outlook to planning, implementation and O+M (Table 8).

Project name: .....		Date: .....	
Project holder: .....		Revisions: .....	
<b>PROJECT ORGANIZATION I</b>			
<b>Actual situation</b>	(Key conclusions of assessment (3.2) and evaluation (3.4) of local context)	Remarks, references, reasons	
<b>1) Positive results, achievements, factors</b>			
11	Local context assessment, structured according SWPO-method		
12			
13			
14			
15			
16			
<b>2) Problems, weaknesses, deficiencies</b>			
21			
22			
23			
24			
25			
26			
27			
<b>3) Opportunities, resources</b>			
31			
32			
33			
34			
35			
36			
<b>4) Omissions, risks</b>			
41			
42			
43			
44			
45			
46			
<b>5) Basic documents, external conditions</b>			
51			
52			
53			
54			
55			
56			
<b>6) Main project objectives</b> (essence of and link to 3.3)		(Variations from the original project objectives should be indicated here.)	
61			
62			
63			
64			
65			
66			

Table 7: Project organisation I - Actual situation/starting position (Form Appendix M. 3)

Date: ..... Revisions: .....

FIELDS	(E) FEASIBILITY STUDY	(F) STAKEHOLDERS RESPONSIBILITIES AND DUTIES (G) CHOICE OF OPTION	(H) DESIGN (J) FINAL DECISION	(K) IMPLEMENTATION	(M) OPERATION AND MAINTENANCE
(1) General	<ul style="list-style-type: none"> <li>◆ <b>Formal confirmation / Acceptance of project strategy</b></li> <li>- Harmonization with other projects (especially sanitation and health)</li> </ul>	<ul style="list-style-type: none"> <li>- Definition of stakeholders rights and duties for different alternatives</li> <li>- Evaluation of alternative</li> <li>◆ <b>Choice of option</b></li> </ul>	<ul style="list-style-type: none"> <li>- Monitoring / evaluation / planning / implementation (MEPI)</li> <li>- Working out of project documents</li> <li>- Preparation of works</li> <li>- Provision of means and capacities</li> <li>◆ <b>Final decision YES / NO</b></li> </ul>	<ul style="list-style-type: none"> <li>- MEPI</li> <li>- Final inspection</li> <li>◆ <b>Commissioning</b></li> <li>- Guarantee works</li> </ul>	(continuation) ----->
(2) Social	<ul style="list-style-type: none"> <li>- Preparation and implementation of conscientisation strategy / campaign</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>- Motivation / facilitation</li> <li>- Promotion / advertising</li> </ul>	<ul style="list-style-type: none"> <li>- Community is aware of processes</li> <li>- Community work (physical and financial contribution) starts efficiently</li> </ul>	<ul style="list-style-type: none"> <li>- Community engagement</li> <li>• in work</li> <li>• in decision making</li> <li>• in financial contribution</li> <li>• in .....</li> </ul>	(continuation) ----->
(3) Institutional	<ul style="list-style-type: none"> <li>- Creation of project committee (nomination / election / appointment)</li> <li>- Forming of feasibility team</li> <li>- Preparation of team for design, implementation and operation (provisional)</li> <li>- Installation of local finance management</li> </ul>	<ul style="list-style-type: none"> <li>- Project committee together with assisting body leads evaluation process:</li> <li>•</li> <li>•</li> <li>◆ <b>Project agreement</b></li> </ul>	<ul style="list-style-type: none"> <li>◆ <b>Approvals</b></li> <li>◆ <b>Project committee operable</b></li> <li>- Creation of implementation structure</li> <li>- Creation of organisation and management structure incl. monitoring, reporting and information</li> <li>- Installation of external support / follow up</li> </ul>	(continuation) ----->	(continuation) ----->
(4) Economy	<ul style="list-style-type: none"> <li>- Financing of feasibility study</li> <li>- Financing options for various alternatives</li> <li>- Starting of local financial contributions</li> </ul>	<ul style="list-style-type: none"> <li>- Discussion of water tariff, prices</li> <li>◆ <b>Acceptance of water tariff</b></li> </ul>	<ul style="list-style-type: none"> <li>- Organisation of financing of investment and operation:</li> <li>• local</li> <li>• national</li> <li>• foreign</li> <li>- Assurance of</li> <li>• Finance control</li> <li>• Safe keeping of finances</li> </ul>	<ul style="list-style-type: none"> <li>- Permanent / frequent</li> <li>• financial management and</li> <li>• financial control</li> </ul>	(continuation) ----->
(5) Technology	<ul style="list-style-type: none"> <li>- Feasibility study (technicians mainly)</li> <li>• Improvement actual situation</li> <li>• Decentralized solution?</li> <li>• Pipe born water supply?</li> <li>• Hand-pumps?</li> <li>• Motor-pumps?</li> </ul>	<ul style="list-style-type: none"> <li>- Technical team acts as consultants (neutral, objective)</li> </ul>	<ul style="list-style-type: none"> <li>- Technical design</li> <li>• Calculations</li> <li>• Drawings</li> <li>• Technical report and cost estimate</li> <li>◆ <b>Authorization, approvals</b></li> <li>- Programme for execution (milestones)</li> </ul>	<ul style="list-style-type: none"> <li>- Direction of works</li> <li>- Quality control</li> <li>- Programme control (milestones)</li> <li>- Development and creation of technical maintenance capacity</li> <li>◆ <b>Creation, approval and installation of maintenance structure</b></li> </ul>	<ul style="list-style-type: none"> <li>- Assurance of local maintenance capacity / autonomy as far as possible</li> <li>- Assurance of appropriate outside assistance / follow up</li> </ul>
(6) Rules Training Regulations	<ul style="list-style-type: none"> <li>- What HRD + ID measures are needed?</li> <li>• In general</li> <li>• for specific options</li> <li>- Legal strategy (rights, dispute settlement)</li> </ul>		<ul style="list-style-type: none"> <li>- Training of:</li> <li>• Management staff</li> <li>• Techn. staff and function holders</li> <li>• Adm. staff and function holders</li> <li>• Users (communal work)</li> </ul>	<ul style="list-style-type: none"> <li>- Training and employment of maintenance staff</li> <li>- On the job training</li> </ul>	(continuation) ----->
(7) Ecology Nature	<ul style="list-style-type: none"> <li>- Environmental implications (guidelines and objectives for specific alternatives)</li> </ul>		<ul style="list-style-type: none"> <li>- Environmental conservation measures</li> <li>• water management</li> <li>• soil protection</li> <li>• watershed management</li> </ul>	<ul style="list-style-type: none"> <li>- Environmental measures</li> <li>- Ecologic monitoring</li> </ul>	(continuation) ----->
Duration	..... Mt	..... Mt	..... Mt	..... Mt	..... Mt

◆ Main Decision UF: 06/00

**Table 8:** *Project organisation II - Checklist for an outlook (what? - who? - when? with whom?)*

### 3.6 Feasibility study

(Item E in Figure 12)

#### Introduction

The local context evaluation report (Section 3.4) is a source of information which should allow the technical team - in consultation with the community and assisted by a community worker - to carry out the feasibility study. This activity should be appropriate to the size and detail of the project in question. It should be as simple and brief as possible and as detailed as necessary. **The feasibility study must show whether and how the existing problems can be faced and how the objectives can be achieved ideally and in a sustainable manner.**

#### Selection criteria

Table 9 is a checklist of questions and basic considerations helping to identify what kind of technical, organisational and financial options could realistically be studied. The discussion of these aspects and alternatives should not be related to the service levels only; it should also give realistic information about costs, maintenance, reliability, risks, etc. Using concise and objective-related selection criteria, the "right solution" should be found. These selection criteria must cover all the project-related fields according to A 3. The choice of technology for water supply systems is described in the Engineering Manual [Vol. 2, Chapter 3].

BASIC QUESTIONS	ASPECTS OF CONSIDERATIONS	
1. TECHNICAL OPTIONS / STANDARDS <ul style="list-style-type: none"> <li>■ What technical standards are reasonably expected?</li> </ul>	- existing situation - improved traditional source - wells - boreholes	- handpumps - public standpipes - neighbourhood taps - yard taps - house connections
2. APPROPRIATE LEVEL OF SERVICE <ul style="list-style-type: none"> <li>■ What level(s) of service are appropriate and affordable for all groups in the community?</li> </ul>	- acceptability of different levels of service - social justice - rates tailored to users' ability and willingness to pay	
3. WATER SOURCES <ul style="list-style-type: none"> <li>■ Which reliable water sources are available?</li> <li>■ Can these provide the required amount of water at the time?</li> <li>■ Do others depend on the same sources (disputes)?</li> </ul>	- springs - groundwater - rainwater - surface water - streams - lakes, ponds	
4. ENERGY SOURCES <ul style="list-style-type: none"> <li>■ What reliable energy sources are available?</li> </ul>	- gravity flow - human power - electricity - diesel supply	- wind - solar energy - biomass - animal power
5. WASTEWATER DRAINAGE <ul style="list-style-type: none"> <li>■ In which way can wastewater be disposed of hygienically?</li> </ul>	- soakaway - gardens - sewers - drains	
6. TECHNICAL RESOURCES <ul style="list-style-type: none"> <li>■ What skills and materials can be made available to sustain the desired service level?</li> <li>■ Equipments, vehicles, tools</li> <li>■ Standardization: possible, desired?</li> </ul>	- skills / technical advice: mechanics, plumbers, carpenters, masons, caretakers (NGOs, private sector) - materials: pipes, pumps, taps, valves, fuel, chemicals, spare parts (local, regional, (inter)national market)	
7. ORGANIZATION <ul style="list-style-type: none"> <li>■ What is the most appropriate organizational structure to sustain the desired service level?</li> </ul>	- village organization - water committee - water supply agency	- private sector, NGOs - extension service - power utility - training opportunities
8. INVESTMENT <ul style="list-style-type: none"> <li>■ What are the financial resources available / required for the desired level of service?</li> </ul>	- affordability - user funds - government subsidies - ESA support - ability and willingness to pay	
9. RECURRENT COSTS <ul style="list-style-type: none"> <li>■ What are the running costs (O + M, including depreciation)?</li> <li>■ What kind of payment system is most appropriate for the users' ability to pay?</li> </ul>	- affordability - fund raising - communal income - regular contributions - water vending / water tariffs - contribution in kind - willingness and ability to pay	
10. OPERATION AND MAINTENANCE <ul style="list-style-type: none"> <li>■ Is local O+M assured?</li> <li>■ Is external support / follow-up possible?</li> </ul>	- local knowledge - training needs - spare parts, tools - energy supply - risks, reliability	

Table 9:

*Checklist for finding an appropriate water supply system*



- local material
- good workmanship



Inappropriate technology,  
or just poor work?



Intake exposed to river flood



**Global view and reduction of number of options**

In a feasibility study only a few alternatives can be worked out. Nevertheless it is usually good to start in a more global way with a greater number of options. In this first step the labour input cannot be very high (between one and three days work for each alternative). After these initial, rough considerations and feasibility reflections a simple comparison of the alternatives may already show a clear order of rank. Based on such a quick first step it should be possible to reduce the number of alternatives considerably, to about 2 or 3 or even fewer (Figure 17). This pre-selection is done by the technical team, in consultation with the project committee.

	Options					
	Zero	Improve- ment	Dezentra- lized	De luxe	High-tech	Centra- lized
I Rough identification of option (few facts and basic figures)	(A)	(B)	(C)	(D)	(E)	(F)
II Rough evaluation and relative comparison; plausibility considerations	✓	✓	✓	<del>///</del> (too expensive)	<del>///</del> (difficult to maintain, poor reliability)	✓
III Pre feasibility study (more detailed investigations, calculations and studies, according to checklist Tab.9)	(A)	(B)	(C)			(F)
IV Evaluation, weighting, ranking (Tab. 10)	<del>4</del>	<del>2</del>	<del>1</del>			<del>3</del>
V Recommendations of the pre-feasibility team (project management)	(unattractive, does not meet the expectations)	<del>2</del> (B)	<del>1</del> (C)			(too expensive)
VI Evaluation by the stakeholders. Main actors are the local project holders / users		<del>///</del> (poor reliability; expensive to maintain)				
VII Decisions / choice of option (item G Fig. 12)			(C) favoured option			

Figure 17:

**Steps of the feasibility study (gradual reduction of the number of options)**

Table 10 shows how pre-selected alternatives can be compared systematically and how related selection criteria are applied in a process of objective weighting and ranking. This table is merely an example and would need to be adapted to specific situations. The community, too, has to play an active role in formulating the catalogue of selection criteria and in determining the factor weights and the rating scale. It might be necessary to add other criteria. If in one field the number of criteria is very high or very low - in relation to the other fields - the weight of this field might be inappropriate. A correction is possible through adjustment of the respective factors of importance. In the example of Table 10 there are weights (importance factors) from one to three. The (quality and/or quantity) rating varies between +2 and -2:

- + 2** *very good*
- + 1** *good*
- 0** *neutral*
- 1** *poor*
- 2** *very poor*

A short verbal qualification is important too, not only for those aspects that cannot be expressed in figures.

Options that are clearly unsuitable from an early stage do not need to be dealt with using Table 10. It is enough just to mention them in the feasibility report with the main reasons for disqualification.

### ***Recommendation***

At the end of this step the management team (guided by the project engineer) should give a clear, well-founded recommendation for a choice between a minimum of two (and a maximum of 3) options. This proposal is the result of a comprehensive feasibility report including Table 10. Unanswered questions and uncertainties appear in the feasibility report. This report forms the basis for further negotiations between all the stakeholders, leading eventually to the selection of one suitable, accepted option. This process and the conclusions must be understood and accepted by the users, the implementing agencies, donors, government, etc.

Field	Criteria		Project alternatives								Project: <i>BULU</i> Date: <i>28.11.99</i> Remarks
	No. Description	Importance Factor 1 - 3	A) Zero Solution		B) Improvement		C) Decentral solution		F) Central solution		
			Rating	Weight	Rating	Weight	Rating	Weight	Rating	Weight	
① General	01. High priority, compared with other development programmes	1	2	2	2	2	1	1	1	1	Rating (+2 ÷ -2) (Weight = imp. Factor x rating)
	02. Project optimally based on local resources (staff, material)	3	2	6	2	6	2	6	0	0	
	03. Good replicability in area (typical for region)	1	2	2	2	2	2	2	-1	-1	
	04. High degree of sector integration	2	1	2	2	4	2	4	1	2	
	Weight of the field	(7)		12		14		13		2	
② Social	11. Good cultural integration	1	2	2	2	2	2	2	-1	-1	
	12. High acceptance by community (consumers)	2	1	2	1	2	2	4	2	4	
	13. Dependency on outside assistance	1	2	2	2	2	2	2	-2	-2	
	14. Noticeable easing of women's work	2	1	2	1	2	2	4	2	4	
	Weight of the field	(6)		8		8		12		5	
③ Institutional	21. Appropriate project structure (committee and organigram)	2	1	2	2	4	2	4	0	0	F) <i>too complicated for rural context</i>
	22. Easy to manage	1	2	2	2	2	2	2	-1	-1	
	23. High degree on inter-institutional integration	2	2	2	1	2	2	4	-1	-2	
	24. Conformity with national plans and standards	1	1	1	1	1	2	2	2	2	
Weight of the field	(6)		7		9		12		-1		
④ Economy	31. Investment	3	2	6	2	6	1	3	-2	-6	
	32. Running cost (20 years)	3	2	6	2	6	1	3	-2	-6	
	33. Economic impact	3	0	0	0	0	2	6	2	6	
	34. Realistic, fair and accepted tariff structure	2	2	4	2	4	2	4	0	0	
	Weight of the field	(11)		16		16		16		-6	
⑤ Technology	41. Quantity of service (coverage)	3	0	0	1	3	2	6	2	6	- C) <i>upgradability</i>
	42. Water quality	2	0	0	1	2	2	4	2	4	
	43. Comfort level	1	0	0	1	1	1	1	2	2	
	44. Low complexity, low risk, high reliability and long lifetime	2	2	4	2	4	1	2	-2	-4	
	45. Based on / adapted to local skills	2	2	4	2	4	2	4	0	0	
	46. Stageability / flexibility	1	1	1	1	1	2	2	0	0	
Weight of the field	(11)		9		15		19		8		
⑥ Training / Rules Regulations	51. Local people can learn and do it	3	2	6	2	6	2	6	-2	-6	- C) <i>similar projects exist</i>
	52. Legal problems can be solved easily	1	1	1	1	1	2	2	1	1	
	Weight of the field	(4)		7		7		8		-5	
⑦ Ecology / Nature	61. Ecologic sustainability	2	2	4	2	4	2	4	1	2	F) <i>Risk of over exploitation</i>
	62. Few and low-level ecological secondary effects	2	2	4	2	4	2	4	1	2	
	Weight of the field	(4)		8		8		8		4	
<b>Rank / Total weight</b>			3.	67	2.	77	1.	88	4.	7	

Table 10: Comparison and ranking of alternatives (Form Appendix M. 4)

### 3.7 *The stakeholders, their specific responsibilities and duties*

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(Item F in Figure 12)

#### **Introduction**

Stakeholders are the legal partners of a project. They are contractually related and bound to undertake an agreed project.

The actors and their relationships are briefly described in [Section 1.3](#). The Water and Sanitation Knowledge System (WSKS), a recommended, actor-oriented tool for identifying roles and responsibilities in water supply projects, is presented in [C 2](#).

***The roles and responsibilities of the various partners must be defined specifically for those few project options which are presented in the feasibility study for a final competition.*** Clear definitions are necessary so that all partners, especially the local community, decide on an option in full awareness of all consequences, not only for the implementation but also for the operation phase. This exercise shows whether, and how, all project duties can be fulfilled. When the responsibilities have been defined the willingness and ability to undertake them need to be investigated, discussed and confirmed. The full acceptance of a specific project option must be evident. The result of this step will be the basis for a final decision and for the project agreement ([Section 3.8](#)).

#### **The stakeholders**

In water and sanitation projects stakeholders are ([Section 1.3](#) and [C 2](#)):

- Community (project committee, caretaker)
- Local or regional administration (district, division, province):
  - Water authority (technical and legal aspects)
  - Territorial administration
  - Health services, agriculture, environmental protection service
- Executing body (GO, NGO, private sector):
  - Project management
  - Engineer/technician
  - Community worker
  - Contractors
- Donor organisations

The partners' structures and organigrams need to be defined, laid down and agreed upon.

#### **Responsibilities and duties**

For each stakeholder the project-related responsibilities and main duties need to be defined. All partners together must fulfil the project requirements. Both deficiencies and over-provision must be avoided. The project feasibility study states the required inputs and activities regarding:

- Management and co-ordination
- Financing
- Technological input, consultancy, training and follow up
- In-kind contributions:
  - unskilled labour
  - skilled labour
  - material supply

- Institution building, management support and training
- Market inputs (supply of goods)
- Others

The defined inputs need to be distributed among the stakeholders according to their required capacities (Table 11). Not only the amount and volume of each contribution but also their quality and the development of the involvement over time must be considered (Figure 15). The responsibility of the local community (e.g. project committee) develops and grows over time which is an indicator of self-reliance and local empowerment.

Stakeholder		Planning	Implementation	O + M
<b>A Community</b>	R	<ul style="list-style-type: none"> <li>• Selection of option</li> <li>• Policy</li> <li>• Election of committee</li> </ul>	<ul style="list-style-type: none"> <li>• Policy</li> <li>• Election of committee</li> </ul>	<ul style="list-style-type: none"> <li>• Policy</li> <li>• Election of committee</li> </ul>
	D	<ul style="list-style-type: none"> <li>• Operation project committee</li> <li>• Financial contribution</li> </ul>	<ul style="list-style-type: none"> <li>• Operation project committee</li> <li>• Financial and physical contribution</li> <li>• Community management</li> </ul>	<ul style="list-style-type: none"> <li>• Operation and maintenance committee</li> <li>• Financial and physical contribution</li> <li>• Community management</li> </ul>
<b>B Local government</b>	R	<ul style="list-style-type: none"> <li>• Link government – community</li> </ul>	<ul style="list-style-type: none"> <li>• Link government - community</li> </ul>	<ul style="list-style-type: none"> <li>• Link government - community</li> </ul>
	D	<ul style="list-style-type: none"> <li>• Development planning</li> <li>• Facilitation of community contribution</li> </ul>	<ul style="list-style-type: none"> <li>• Development planning</li> <li>• Facilitation of community contribution</li> <li>• Control functions</li> </ul>	<ul style="list-style-type: none"> <li>• Development planning</li> <li>• Facilitation of community contribution</li> <li>• Control functions</li> </ul>
<b>C Project management (executing body)</b>	R	(Spelling or private sector) <ul style="list-style-type: none"> <li>• Planning process</li> </ul>	(Government, private sector or NGO) <ul style="list-style-type: none"> <li>• Quality, time, costs</li> </ul>	(Community or private sector) <ul style="list-style-type: none"> <li>• Reliable operation</li> <li>• Quality of water supplied</li> <li>• Costs</li> </ul>
	D	<ul style="list-style-type: none"> <li>• Optimal planning in coordination with all stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>• Implementation according to programme and plans</li> </ul>	<ul style="list-style-type: none"> <li>• Optimal O + M</li> </ul>
<b>D Provincial water engineer</b>	R	<ul style="list-style-type: none"> <li>• Dimensions, technology</li> </ul>	<ul style="list-style-type: none"> <li>• Quality</li> <li>• Accordance with policy</li> </ul>	<ul style="list-style-type: none"> <li>• Consultancy</li> </ul>
	D	<ul style="list-style-type: none"> <li>• Control, supervision</li> </ul>	<ul style="list-style-type: none"> <li>• Control, supervision</li> </ul>	<ul style="list-style-type: none"> <li>• Control, supervision</li> </ul>
<b>E Private sector; NGO</b>	R	<ul style="list-style-type: none"> <li>• Cost effective solutions in accordance with the TOR</li> </ul>		
	D	<ul style="list-style-type: none"> <li>• Feasibility study</li> <li>• Planning in detail</li> </ul>	<ul style="list-style-type: none"> <li>• Construction management</li> <li>• Construction work</li> </ul>	<ul style="list-style-type: none"> <li>• Consultancy</li> <li>• Management assistance</li> <li>• Operation according to contract</li> </ul>

Table 11: The stakeholders' responsibilities (R) and duties (D) (Form Appendix M. 5)

The results of this chapter (Table 11 and organigrams for the selected option) become integral parts of the agreement (Section 3.8). The individual function holders' detailed duty sheets will be defined later - during the implementation phase (Section 4). However, roles and responsibilities for operation and maintenance should be discussed, agreed and established at this early stage.

### 3.8 Choice of option, final decision, project agreement

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(Items G and J, Figure 12)

#### *The choice of option and the final decision*

*The aim of these milestone steps is that the partners accept and confirm the choice of technology and system. The entire community and other stakeholders should be fully committed to the project they wish to see realised,* perhaps through step-by-step upgrading. To make this decision a clear one it is necessary to discuss the project feasibility report in detail. The future users must know what alternative options have been evaluated and why they have been disqualified. The use of visual aids and visits to other projects can be helpful at this stage. Before the final decision is taken all unanswered questions and doubts must be discussed and clarified. Discussions, preliminary and final decisions for the optimum choice take place in an official forum like a general assembly. ***The reasons for the choice and for the final decision should be recorded in minutes that are included in the feasibility report.***

The results of the feasibility study require clarification and confirmation through the process of detailed planning and design (item H; Section 4.2) which is part of the project implementation.

#### *The project agreement*

The conclusions of the findings and decisions are laid down in the project agreement. ***The main elements of the project agreement are:***

- Project definition (technical system, service standard, size, locations, O+M concept, etc.)
- Financial contributions; in-kind contributions (for construction and O+M)
- Responsibilities, related competencies and duties in the various phases (Section 3.7; Table 11)
- Monitoring, reporting, information and evaluation
- Financial proceedings including control and auditing
- Concepts for Human Resource Development (HRD) and Institutional Development (ID - sometimes referred to as Institution Building - IB)
- Timetable with milestones
- Procedures for alterations to the original plan
- Legal ownership
- Sanctions, termination of contract
- Appendices:
  - List of reference documents (integral part of the contract)
  - Organigrams
  - General plan of execution

Appendix K is one example of a project agreement for a rural water supply project in Cameroon. *The project agreement is the milestone where all the relevant documents (decisions, objectives, target lists, etc.) are put together in a concise dossier.* The secretaries' and the engineers' documents contain the details and full history. Figure 18 shows schematically how the agreement milestone is a position where earlier achievements and outputs are drawn together.

Fields	External conditions / Project preparation	AGREEMENT	Implementation		Operation and Maintenance (O + M)
			Planning + Design	Construction	
0 General	○ 02.03.93 Application ○ 20.06.93 Socio-economic Questionnaire	● 22.07.96 Main agreement (provisional)			● Integral parts of the contract ○ Basic documents x Settled in the agreement
1 Social	○ 04.02.92 Decree No. 374 CBM ○ Local context ● 02.10.94 Assessment report ● 04.11.94 Evaluation report	● Annexes: Documents with ● from the left side		X Evaluation	
2 Institutional	● 12.02.94 Committee Regulations ● 12.05.95 Stakeholders' duties ● 20.6.95 Formal decision (option)		Final X decision Yes / No		
3 Economy	● 04.06.95 Finance plan		X Auditing (every 12 months)	X	X
4 Technical	● 10.05.95 Feasibility study		Operational plan X	X Operation/management Final inspection / X commissioning	X X X
5 Rules, training			X Training activities		
6 Ecology, nature	○ 04.06.93 Law No. 038 Water resources management		Time axis →		

Figure 18: Elements of the project agreement and basic documents (fictional example)

## 4. PROJECT IMPLEMENTATION

(Items H, I, K, L in Figure 12)

### 4.1 Introduction

#### Context

The vision that was developed in a participatory manner has now taken shape in a defined project that was selected from a range of options. At the implementation stage, the involvement of all partners, in particular the community, enters into the most intensive phase. The project preparation (Section 3), the professional application of the management tools (Part C) and the constant recognition of sustainability criteria and guiding principles (A 3) ultimately determine the success and the real quality of a project.

#### Key issues

***The design of a tangible project belongs to the implementation phase***, because it is the detailed definition, the preparation and organisation of the physical, social and administrative processes. The design includes also the creation of management concepts and capacity building at different levels. Function holders and staff should have the opportunity to grow gradually into their jobs. Design means therefore development and transition towards execution or construction. However, ***the final green light, the irreversible 'go', will be confirmed only when the technical design with cost estimates is made, when funding is organised and when necessary authorisations and approvals are issued.***

Implementation includes not only the construction but also the proper completion and handing over, and introduction of a suitable operation and maintenance structure.

The project organisation (Section 3.5) contains the basic checklists for implementation. However, the management must remain flexible, prepared to consider new developments and changing conditions.

### 4.2 Elements of a project design

(Item H in Figure 12)

#### Scope

***To design a project means:***

- to design the system and to calculate the dimensions
  - to estimate the costs
  - to define the location(s)
  - to determine the construction processes
  - to consider the other, integrated design factors according to Figure 19.
- } Engineering details are given in [Vol. 2]

At the same time organisation and management need already to be developed and introduced gradually (Section 4.3). Figure 19 shows what steps are normally necessary in the design stage. For a small project the number and the details can be reduced, for a large and complex situation however, additional items might be necessary.



	No.	Item, Step, Activity	Programme			Remarks
			4.2 Design 4.3 Organization, Management	4.5 Constr.	5. O+M	
<b>DESIGN PHASE (4.2)</b>	1.	Contract for design (Terms of Reference)				Partners and their qualifications, responsibilities, duties, organigram
	3.	Assembling the design team				Nomination of staff, duty sheets
	5.	Supplementary survey / answers to open questions of section 3.6; verification / completion of feasibility study				(3.6 – 3.8) Annex report, lists, photos, minutes
	7.	Natural resource monitoring and evaluation				(C 3.7; C 5.2) Programme, forms, monitoring concept
	9.	Natural resource management				
	11.	Drafts and rough calculations (shapes, dimensions, locations, qualities, etc.)				(3.6; 4.2) Sketches, list of conflicts, open questions
	12.	Find out the legal and technical rules and guidelines				(2.2; 3.2) National policy, legal documents, e.g. for watershed management
	13.	Negotiation about project objectives (users, donors, government, NGOs, affected people, etc.)				(3.3) Minutes / agreements about process of project optimisation
	15.	Conflict settlement (as far and as early as possible)				(A 4.2) Minutes, agreements
	17.	Design of structures and secondary measures				Drawings
	19.	Modifications (technical and financial optimisation, in cooperation with government, consultants)				Technical documentation
	21.	Final drawings, technical report including cost estimate and finance plan (investment + operation)				Project dossier for the actual stage (no confusion with extensions)
	23.	Environmental assessment report (verification of feasibility report)				(C 3.8) Assessment report (effects, additional measures)
	25.	Elaboration of: <ul style="list-style-type: none"> <li>• working and construction methods</li> <li>• staff and material (requirements)</li> </ul>				Engineers' documentation
	27.	Requests for approvals (technical and financial) <ul style="list-style-type: none"> <li>• Government</li> <li>• Donors</li> <li>• Local community/project committee</li> </ul>				Applications / administrative procedures (give assistance and consider enough time)
	29.	Approvals (from GOs)				(3.5; 4.2) Written approvals
	31.	Preparation of material + equipment (local and imports)				Executing body
	33.	Provisional contracts with potential firms / contractors				Investigations, TOR (quantities, targets, price, guarantee, .....)
	35.	Provisional contracts with land owners / users				Rights and duties, durations
	36.	Design management				
37.	Review / evaluation of steps 1 - 36					
39.	Final "GO"! (Confirmation of project decision)				(3.8; 4.3; 5.3; 7.8) Official general meeting, votation, minutes	
<b>ORGANIZATION / MANAGEMENT (4.3)</b>	41.	Capacity building (ID / HRD)				CBM; O + M
	42.	Policy making (regulations; contracts)				Confirmation / enforcement of prepared contracts and strategies
	43.	Information / communication				(C 5)
	44.	Organization and management (general)				(C 4; C 5)
	45.	Financial management				(C 7)
	46.	Community contributions (in-kind + cash)				
	47.	Pilot projects				
	48.	Evaluation of steps 41 - 47				

Figure 19: Design steps

### 4.3 Elements of organisation and management

(Items H and K in Figure 12)

#### Scope

Project design and the development of management capacity go hand-in-hand. Management means to organise the implementation of the agreement (Section 3.8) and of the project strategy (Section 3.5). The size and complexity of an organisation depend on the particular project in question. Management continues in the operation and maintenance phase.

Sectors and subjects of management and organisation related fields and actors are summarised in Figure 20, which can serve as a checklist. The respective tools for management and their application are introduced mainly in C 1 (Decision-making) and C 4 (Implementation).

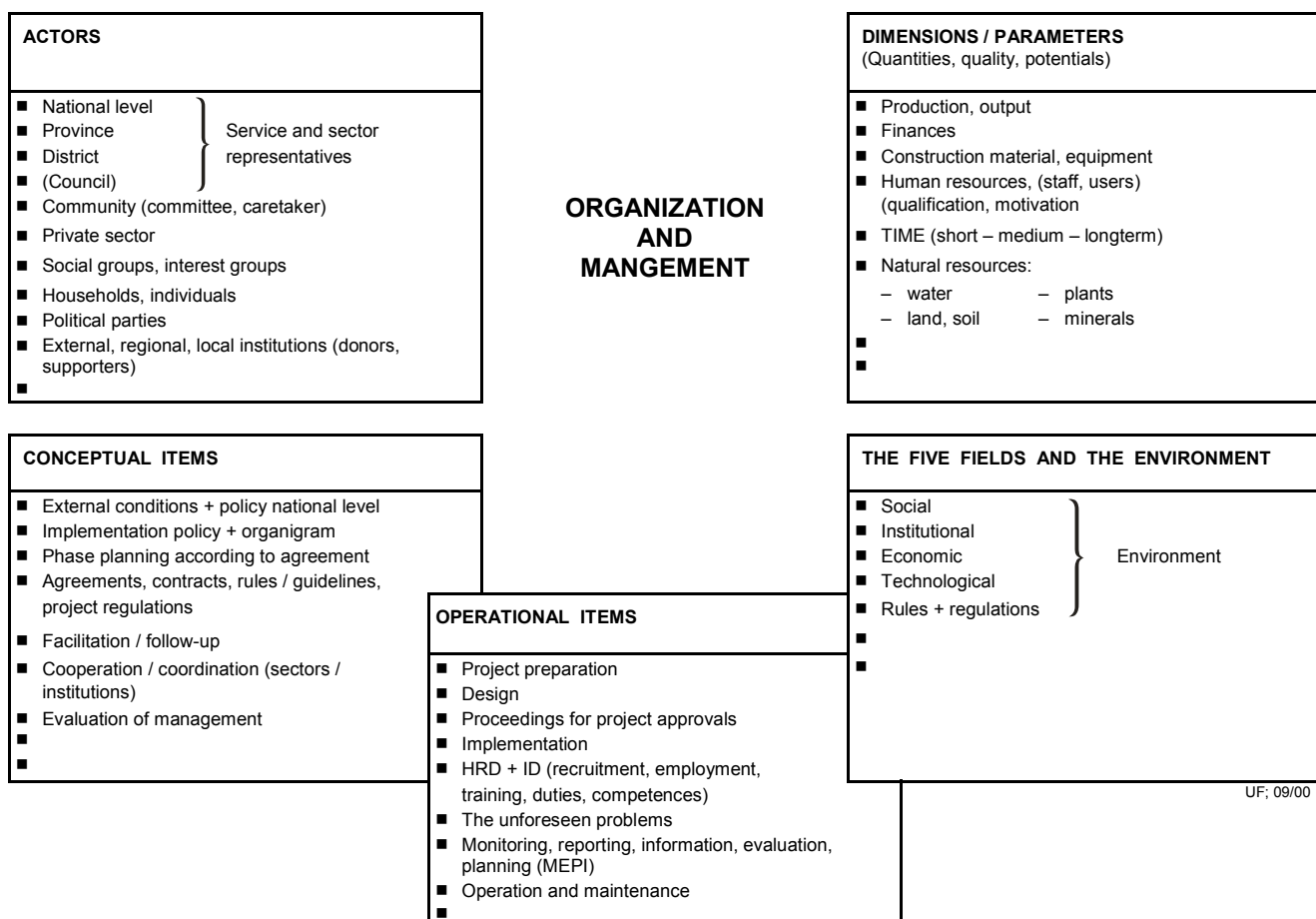


Figure 20: Organisation and management: Fields, actors, parameters, conceptual and operational items (checklist, memory aid)

**Who is the project management ?**

**The project management must be clearly defined and decided among the stakeholders. The users, who are in most cases the owners of a project, should be represented competently at management level, with legislative and executive power.** During preparation and construction of a project the government, a qualified engineer and donors might be part of the management. The management team should be competent and should:

- have a good professional background
- not be too big (generally not more than five persons)
- be given clear duties, competencies and responsibilities
- be provided with external assistance and human resource development.

During planning and implementation, the capacity and leadership of the local project management should be gradually built up in order that local users will be enabled to manage and to maintain the scheme or project autonomously as far as possible.

**Management of people**

The recruitment, selection/election and employment of paid and voluntary people require independence, professionalism and transparency (C 4.4). **Employment and working conditions should be fair and attractive**, though not primarily financially. **Duties, competencies and rights need to be formulated and written down** (see Duty Sheet, example Table 14).

Personal engagement and team spirit should be addressed in the project policy and in the management - they are most essential. Training in technical, social and administrative fields are a good source of motivation. A suitable working place, reliable tools, equipment, vehicles, practical guidelines and handbooks are preconditions for any successful work.

**Caretakers and other key-persons for operation and maintenance should already become involved during the construction phase (on-the-job training).** As far as possible working teams should include people from the project area. However, community management creates a significant demand for technical and logistical support (consultancy and material assistance). An efficient follow-up capacity needs to be created.

A staff and group meeting is a highly efficient management tool. They should take place regularly, not too often, not too rarely. They can follow a standard agenda, but there must be free space for individual inputs.

**Management of information**

**The project management is responsible for the information policy and culture** (quantity and quality of dialogue and information). Tools and strategies for information management are presented in detail in C 5.

**Recapitulation of a few key objectives**

- **for information:**
  - Short and simple language
  - Facilitation of understanding of sectors, institutions, hierarchies, etc.
  - Better work happens through knowledge and motivation
- **for documentation and filing:**
  - Awareness, transparency and trust
  - Quick access to specific information
  - Learning from and sharing of experiences
  - Avoiding the loss of institutional memory (through fluctuation of staff)
  - Facilitation of efficient management

The project management runs the main documentation, while each staff member has his/her own working documentation. Their observations and reports contribute to the monitoring and evaluation database of the project.

## **Executive management**

The tools for implementation are described in [C 4](#). ***The operational plan (Section 4.5), the key tool for project managers and implementers on all levels usually covers one year.*** It needs periodic review and adaptation (flexible management), without losing sight of the objectives and overall goals. The operational details of the management covering shorter periods are also described in [B 4.5](#).

### **Recapitulation of principles**

#### ■ **for management:**

- phased plan (milestones) and operational plan are steering instruments (ensuring goal-conformity of process)
- Integration of M + E system (steering and permanent optimisation)
- Management (re)acts within short time (spontaneity, flexibility)
- Monitoring the fulfilment of contracts and the application of sanctions, if necessary
- Management takes time also for conceptual work, for consulting with staff, and/or dealing with unforeseen aspects.

#### ■ **for the supervision of the work (site management):**

- Preparation of works (site, personnel, materials, equipment, tools, information of landowners, authorisation, etc.)
- Construction quality control (e.g. quality of concrete, pipeline pressure resistance, placing and covering, pumping tests, etc.)
- Environmental quality control (e.g. water household, ecological location of structures, erosion control measures, plant development, etc.)
- Efficiency and progress control
- Promotion of on-the-job training
- Construction monitoring and reporting
- Optimum and careful use and maintenance of equipment and vehicles (project-owned and hired equipment)
- Calculation and counting of real costs including depreciation
- Proper equipment recording and stock management (purchase, transport, storage, handing out, etc.)
- Official commissioning (comprehensive check, handing over of functions, structures, full documentation including guarantees and instruction papers).

## **Formal arrangements**

### **Contracts / agreements / statutes / duty sheets**

Good management is based on agreed goals, concepts and clearly defined tasks. Depending on the nature, size and complexity of a project the necessary formal arrangements must be worked out. Table 12 is an incomplete list of possible arrangements with their main components. Such agreements are needed in order that each partner knows in advance not only the project goals, but their responsibilities, duties and rights.

<b>FORMAL ARRANGEMENTS</b>	<b>FACTORS POSSIBLY TO BE DEFINED</b>
<p><u>Institutional Level</u></p> <ul style="list-style-type: none"> <li>- Cooperation Agreement between Central Government and ESA</li> <li>- Cooperation Agreements between local NGOs and ESA</li> <li>- Project Cooperation Agreements between community (project holder) and ESA; with local NGO and government</li> </ul> <div style="border: 1px solid black; padding: 2px; margin: 5px 0;"> <ul style="list-style-type: none"> <li>- Statutes of a local water committee – Table 13</li> </ul> </div> <ul style="list-style-type: none"> <li>- Statutes of branch or tap committees</li> </ul>	<ul style="list-style-type: none"> <li>• General characteristics</li> <li>• Aims</li> <li>• Main goals</li> <li>• Intermediate goals</li> <li>•</li> <li>•</li> <li>• Membership, partners</li> <li>• Durations, deadlines, termination</li> <li>• Area of validity</li> <li>• Control organs</li> <li>• Probation period</li> <li>•</li> <li>•</li> </ul>
<p><u>Execution Level</u></p> <ul style="list-style-type: none"> <li>- Contracts for construction work</li> <li>- Contracts with suppliers</li> <li>- Employment contracts (full-time, part-time, seasonal)</li> </ul> <div style="border: 1px solid black; padding: 2px; margin: 5px 0;"> <ul style="list-style-type: none"> <li>- Job description for a water supply caretaker – Table 14</li> </ul> </div> <ul style="list-style-type: none"> <li>- Consultancy contracts</li> <li>- Regulations               <ul style="list-style-type: none"> <li>- tariffs</li> <li>- technical</li> <li>- financial</li> <li>- administrative</li> <li>- information</li> <li>- maintenance</li> <li>- monitoring</li> <li>- quality control</li> </ul> </li> <li>- Training arrangements</li> </ul>	<ul style="list-style-type: none"> <li>• Information, public relations</li> <li>• Monitoring, reporting</li> <li>• Financing, payments, wages</li> <li>•</li> <li>• Penalties, sanctions</li> <li>• Mention of other contract parts (annexes such as:               <ul style="list-style-type: none"> <li>- duty sheets</li> <li>- time schedules</li> <li>- etc.)</li> </ul> </li> <li>•</li> <li>•</li> </ul>

Table 12: Formal arrangements – a few examples

<u>General characteristics:</u>	Name, place of residence and purpose of the organization; Date of establishment; Legal status; Project location, size;
<u>Membership:</u>	Qualifications and conditions for membership; Procedures for application, acceptance and cancellation as member of the organization;
<u>Administration and sectoral integration:</u>	Compliance with national policies and development plans; Integration in national and regional structures; Administrative and sectoral coordination and integration;
<u>Sources of income:</u>	Contributions, rates, subsidies, loans and other revenues;
<u>Committee(s):</u>	<u>Composition:</u> number and function of committee members; composition of executive committee, and sub-committees where necessary; <u>Election:</u> occasion, procedure; length of term of office; possibility of re-election; by-elections in case of resignation, etc.; <u>Representation:</u> of the interest of all user categories, including women and low-income households <u>Functions:</u> responsibilities and authority of each function, character of the work (voluntary or paid; type of payment)
<u>Meetings:</u>	<u>Committee(s):</u> frequency, purpose and authority of meetings of the committee(s) <u>General assemblies:</u> frequency of assembly; minimum period between announcement and assembly; user information on time, place, purpose; <u>Purposes of meeting:</u> rendering and account of the preceding period; appointment of a financial control committee for the next financial period; recruitment and election of committee members; other relevant business etc.; <u>Validity of meetings:</u> representation of various user categories; voting rights (e.g. heads of households only, or male and female heads, or one adult, one vote); quorum for important decisions; conditions for a general meeting on request of the users;
<u>Changes:</u>	Procedures for changing the statutes; procedures for winding up the organization.

Table 13:

*Issues commonly covered in the statutes of a local water committee – an example (Form Appendix M. 6)*

Two specific tables (Table 13 and Table 14) may serve as examples and checklists.

JOB DESCRIPTION	
<u>Project:</u>	.....
<u>Function:</u>	Water supply caretaker
<u>Function holder:</u>	.....
<u>Contract basis:</u>	Employment contract of: .....
<b><u>Main duties:</u></b>	<b>Preventive maintenance; simple repairs; site management; user communication / advice; recording and reporting to the water committee (WC) ; training and supervising of assistant caretaker; participation in water committee meetings, training</b>
<u>Tasks:</u>	<p><u>Preventive maintenance:</u> visit to water supply structures; control of leakage and hygiene; cleaning of site and drains; upkeep of surroundings (daily)</p> <p><u>Simple repairs:</u> replacement of washers; repair of cracks in masonry; repair of bathing screens, fences, etc. (occasionally, perhaps a few time a year)</p> <p><u>Site management:</u> ensuring proper tap operation and water use; management of laundry and bathing facilities; advising the tap and/or water committee on site maintenance, user regulations and other relevant issues concerning the waterpoint (daily to periodically)</p> <p><u>Management of tools and spare part stock</u> (financial proceedings and competence according projects regulations)</p> <p><u>Working programmes:</u> elaboration of seasonal and weekly programmes (caretaker, assistant, community, external assistance)</p> <p><u>User communication:</u> liaison between the tap users and the water committee; information on reasons and duration of break-downs; demonstration and discussion of proper water use (periodically, perhaps several times a year)</p> <p><u>Monitoring / recording and reporting:</u> for maintenance, repair and water use to the community water committee or other local organization administering the water supply (daily reporting in logbook, summary reports several times a year, according to project regulations, information in water committee meetings).</p>
<u>Representation:</u>	In case of absence of the caretaker the assistant caretaker acts on his/her behalf. If the vice-president of the committee is absent the caretaker represents him/her.
<u>Responsibility:</u>	The caretaker is responsible for the formulated tasks. S/he is subordinated to the water committee. In cases of conflicts and problems s/he contacts the water committee. The approved water supply regulations are a binding guideline.
	Noted and accepted: ....., .....
	The caretaker: ..... For the water committee: .....

Table 14:

*Job description for a water supply caretaker - an example for a small gravity system (Form Appendix M. 7)*

## 4.4 Financial management

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### Introduction

Financial management is essential during construction and operation. It includes:

- Finance policy
- Finance planning, budgeting, liquidity planning, timely collection of contributions and funds
- Cost control and auditing
- Publication of financial information (transparency).

The future project managers responsible for O+M should already be engaged in financial management during implementation. The project committee might e.g., handle expenses for contractors.

Most decisions can only be taken on the basis of a clear and sound financial situation. It has become clear that communities should have an increased share of the responsibility in the provision of the necessary resources. Simple and sound economic and financial management are necessary to ensure that infrastructure or other projects continue to function. ***Transparency and trustworthiness in financial matters are key conditions for the smooth running of any community programme.*** Misuse of funds or even loss of confidence rapidly inhibits further contributions. Principles in the economic field, like financing, cost recovery, etc. are dealt with in [A 3.4](#). A presentation of tools and principles for economic resource management is given under [C 7](#).

For simple projects with a single purpose or activity, a simple receipts and payments account based on a cashbook may be sufficient. For projects involving several activities, income and expenditure accounts and balance sheets are necessary; books should then be kept using double-entry bookkeeping. Some kind of visual presentation of accounts is always worthwhile. For example in annual reports, piles of coins of various sizes can be used to illustrate the way funds are apportioned for different purposes.

The recommendations given here are suitable for smaller projects (e.g. water supply systems for not more than about 20,000 people or for programmes with few or no full-time employees). Common tasks of financial management are listed in Table 15.

The institutional set up including the local financial management requires legal approval by (or at least permission from) the relevant government authorities.



Task, Action		Executors / Contributors							Ordinary Controller(s)	Documents, Forms	Remarks	
		Central Government	Local Government	Community project holder	Committee, together With executing body	Local NOG (facilitator)	External Support Agency	Others				
<b>ECONOMIC / FINANCIAL PLANNING</b>												
- National and regional development plans	5 y	X	O								} beyond project	
- Local development plans	3 - 5 y		X	O			O	O	O			
- National and regional Finance plan	5 y	X	O									
- Local finance plan	3 - 5 y		x	O			O	O	O			
- Project or programme Finance plan	3 y		O	O	X	Committee + Engineer	O	O	O		Investment and running cost	
- Budget (investments and running)	1 y			O	X		O	O				
- Operation plan	1 y			O	X	Com. + Engl.	O	O				
- Cash flow plan	1 y				X		O				Not in small projects	
<b>ORDINARY BOOKKEEPING</b>												
- Financial opening balance	1 y			O	X	Treasurer	O			Committee	Balance sheet forms	Begin of financial year
- Inventory of investment and equipment	1 y			O	X	Committee + Engineer	O			Committee		
- Cash book					X	Treasurer	O			Secretary	Book	
- Bank book - current					X	Treasurer	O			Secretary	Book	
- Bank book - investment					X	Treasurer	O			Secretary	Book	
- Petty cash account I					X	Treasurer				Secretary		revolving accounts of about
- Petty cash account II					X	Caretaker				Treasurer		20 - 30 US \$ only
- Other accounts ° Donors account ° Running costs, general expenses ° Salaries, wages ° Vehicles, running ° Investment, equipment ° Others according needs					X	Treasurer	O			Secretary	Account forms	Treasurer is accompanied by one nominated committee member (assistant)
- Financial result of the year ° Financial balance	1 y				X	Treasurer	O	O		Auditors	Balance sheet forms (assets + liabilities at a particular time are grouped under headings*)	End of financial year / annual accounts Income and expenditure (profit and losses) Amounts owed, depreciations, etc. are adjustments to be shown * e.g. fixed assets (reasonably valued), current assets (realisable in cash within a short period), longterm liabilities, current liabilities (should include all amounts due for payment or which may be called in at any time), reserves. All together = net value of the project
° Inventory of investment and equipment					X	Treasurer, caretaker	O	O				
<b>PARTICULAR ACTIVITIES / TASKS</b>												
- Rate collection					X	Rate collector				Treasurer	- Cash book for collector - Receipt vouchers	
- Stock management					X	Caretaker				Treasurer	- Stock cards - Stock entry vouchers - Stock out vouchers	
- Economic activities / fund-raising campaigns				O	X	All	O	O				
<b>RECORDING / REPORTING / INFORMATION / COOPERATION</b>												
- Auditing	1 y				O	Treasurer and assistant member			min. 2 Auditors*	Gen. Assembly	Formal auditing report	* Independent elected auditor, one professional End of financial year; special occasions
- Monthly financial record	1 m				X	Treasurer				President	Form	Reference to cash flow plan or budget
- Annual account	1 y											See above
- Yearly financial report	1 y				X	Treasurer + President				Gen. Assembly	Formal report	Part of annual report
- Recording rate collection	1 m				X	Rate collector				Treasurer	Collector's cash book	With remarks column
- Contacts / cooperation with Community	frequent				X	Committee				Community	Meetings	
- Contacts / cooperation with bank, cooperative	frequent				X	Treasurer			Assistant member	President	- Frequent contacts - vouchers	
- Contacts / cooperation with donors	sporadic				X	President				Committee	- Letters - Bookkeeping documents	

Table 15:

Financial planning and financial management in infrastructure projects (Form Appendix M. 8)

## General rules for financial management

Aspects which should be defined and laid down in regulations or project instructions, approved by the general assembly and by the partners:

- The **finance plan** for implementation and O+M covers a **period of 3 to 5 years**. It is based on the phase plan, on financing agreements and on the tariff regulation.
- In the **budget, costs and income for one year** must be brought to a balance. This includes analysing capital and cash flow, the latter being essential for checking that liquidity remains assured. Budgets often go wrong because of over-optimistic income assumptions or inadequate bills of quantities.
- **'Different money' should not be mixed**. All income and expenditure must be allocated to their specific accounts, e.g. for:
  - construction and investment
  - running costs, maintenance and repair (current account)
  - savings for reinvestment
  - savings for extensions
- At the end of a financial year it might be possible to transfer some money from the current account to the savings account.
- Types of **water rate collection**: A common system is to collect user payments through home visits. This work is frequently done by women, and seems to fit in with women's patterns of social visiting and housekeeping. In some cultures husbands would object to male collectors visiting their house during their absence. That women have fewer opportunities to abscond with funds may be another factor for their successful involvement as rate collectors and treasurers. Other possibilities for rate collection are: standpipe collection (water kiosks), payment at periodic meetings, payment at the office or at the cashier's house.
- With **meter systems** there is separate reading, billing and payment for effective consumption (for characteristics see C 7, Table 14). Despite the critical remarks in Table 14, consumption from private house connections should be measured using water meters and billed accordingly, as soon as it exceeds 20 - 30 % of the total water production. Pre-payment systems with rechargeable taxcards (chips) are being piloted. High costs and initial weaknesses must be overcome before such technologies can be applied on a longer scale.
- To facilitate **payment control** of connection fees or water rates and at the same time to reduce the risks of defaulting, a **visual system of recording** household contributions could be applied. This makes it easy to identify families or institutions lagging behind in payment and creates a certain social control.
- All **transactions of money or material must be recorded** with date and signature in the books. The receiver must give a written receipt voucher to the payer. Contributions in the form of labour have to be recorded in a similar way to cash payments (but in a separate account).
- **Handling cash is risky**. For this reason, and because of the possibility of earning interest, it is advisable to deposit money as frequently as possible in reliable banks or credit institutions.
- **One project** or programme has **one set of accounts**. The same accounts and records serve for internal management, for information of the community, government and external donor organisations.
- The **financial competencies** of committees and individual function holders or members and the guidelines for signatures must be defined and agreed (using duty sheets).
- **Audits**: A proper audit should be carried out on an annual basis. The auditors must have access to all books and documents. They will often reveal weaknesses in the financing of the project which may threaten its future. Projects should therefore ask the auditor for their comments, indicating the strengths and weaknesses of the scheme.

- **Depreciation:** The yearly reduction in value of all equipment and infrastructure should be included as an expense in the profit and loss account. Usually losses due to inflation are not fully compensated by the interest earnings on savings. As a result, the depreciation rate must be considered with an appropriate supplement of about 50 % (depending on the national economy). When a pump of US\$ 2,000 is expected to have a working life of 8 years, the savings account for reinvestment should be credited yearly with  $1.5 \times 2,000 \div 8 = \text{US\$ } 375$ . It is not always possible to accumulate savings for all parts of a project. The minimum requirement, however, is that the appropriate depreciation must be allowed for mechanical equipment, tools and vehicles. Sometimes it is wise to invest saved money in a stock of material like pipes and spare parts. Such a stock should not exceed the consumption of three to four years and the storage must be safe and secure.

### **Stock management**

**Stock management is a form of bookkeeping**, and as such comes under the regime of financial management. The value of a caretaker's stock can be very high. Management allows control and helps to avoid misuse or theft.

Simple record keeping and stock management routines (stock cards) help to avoid running out of essential materials or parts. These routines will usually be new to the people concerned, and agency staff need to watch carefully to see that the local caretakers recognise the value of simple record keeping.

## **4.5 Construction management**

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(Item K in Figure 12)

### **Scope**

Some thoughts and recommendations are provided for the construction phase itself. By this stage, the preparation of the project, including the setting up of organisation and executing management and the definition of responsibilities have been done. The project goals are defined in the agreement, in the approved project dossier (including cost estimate), and in the phase plan.

### **Operational plan**

**The operational plan (C 4.2) is the key tool for participative and transparent construction management.** It is the responsibility of the project management and provides for a brief orientation for all people and institutions concerned. Figure 21 is a form that can be used for flexible operational planning. The parts A, B (left), and C (left) are filled in advance, whereas B (right), C (right), and D record the yearly achievements. In field E, targets and achievements can be entered. Details and explanations should be given in a supplementary report. The form should be modified for specific situations.

Project: Adani Water Supply Date: 15.12.00 Revision:             
 OPERATIONAL PLAN Year: 2001 Signature: C. Ndifan

**EXAMPLE**

A OBJECTIVES FOR THE YEAR		B INPUTS	
		Assumed	Realized (until end of the year)
• Proj. 80% compl. • Community trained • Hyg. camp. in 3quart. • Caretaker trained • Priv. sect. involved		• US\$ 80 000 Misereor • KSh. 30 000 Village • KSh. 30 000 from people living outside • 1800 days free labour	

C OUTPUTS		D MAJOR PROJECT CHANGES	
Expected	Realized (until end of the year)		
• 3600 m pipeline • 12 Std. posts • Storage tk. 521cm			

E MAIN ACTIVITIES DURING THE YEAR													Responsibilities	Remarks	
Sectors/Fields	No.	Activity	1	2	3	4	5	6	7	8	9	10			11
1) Institution building and human resource development	11	Caretaker course													HOW INADES Health DO
	13	Adm. course													
	15	Sanitat. training													
2) Community action	21	Comm. work													Quart. Hd. Chief Ani+ Eng.
	22	Water Day													
3) Construction	31	Pipelines													Eng. P. Teh
	33	St. posts + yard conn.													
	35	Intake													
	37	Reservoir Schem													
4) • Mech. Workshop • Vehicles/ Equipment • Tools	41	Constr. building													Eng. W. Committee Treasurer+CT
	43	Purch. adm. Veh.													
	45	Purch. toolboxes													
5) Finances	51	Transf. Misereor													1) + Audit
	53	Budget Contr.													
6) Monitoring / Reporting	61	Sector report													Sect. head Proj. Manager
	63	Project report													
	65	Monitoring													
7) Management Evaluation	71	Implement.													acc. guidel.
	73	O + M													
	75	Evaluation No. 3													
8) Various	81	Presid. elections													
	83	Visit Min. of Water													

Figure 21: Operational plan (Section 4.3 and Appendix G. 1)

**Operational management**

The finer points of organisation and detailed management, including monitoring and evaluation of the specific activities, is the responsibility of the supervisors, technicians and executors. It is not only technical activities that need professional operational management, but also community activities (in-kind and cash contributions), fund-raising campaigns, training activities and awareness-raising, and even management itself need to be managed and evaluated critically and objectively. Government organisations, NGOs and the private sector all need operational management, which is based on the same principles.

Some tools are shown in C 4 and in Appendix G. Figure 22 shows a proposed format for *operational management of work supervision, suitable for short periods (1-3 months)*.

*Construction management is co-operative and participative.* Figure 21, Figure 22 and the respective comments indicate different aspects of management which require tools tailored to the specific project situation. Information and communication tools (C 5) and especially staff meetings are very important for operational management. Reporting (C 5.2) too is essential for successful co-operation and co-ordination.

Project: Adani Water Supply Date: 26.12.00 Revision: .....

Section / field: Construction Signature: C. Ndifon

OPERATIONAL MANAGEMENT Period: Jan - March 01

EXAMPLE

ACTIVITIES No.	Month: Week No.	Jan.			Feb.			March			Responsibilities Remarks						
		1	2	3	4	5	6	7	8	9		10	11	12	13	14	15
Pipelines Section A Section B			Excav.	pipings			PT	X	backfills.								PT=pressure test
							Excav.	pipings	PT	X	backfills.						
Storage Storage Salem					cleaning					Construction							
Std. Posts Quarter Loma " Super Hill " Hongo					3					4							
Equipment Lorry No.2					revision												
Monitoring Reporting	Foremen	Monthly report						*		*							
	Sector head	Quarterly report															* +cost control
Various Visitors from N. Prov.																	Proj. Manager

Figure 22: Operational management, sector / fieldwise (Appendix G. 2)

### **Construction monitoring**

The systematic monitoring of construction means optimum observation control and recording of the relevant aspects (Section 4.4). Monitoring also includes the careful registration of changes to the initial project. At the end of the construction phase a dossier should be available showing the project as finally constructed (as-built plans).

### **Quality control and safety**

In the relevant technical manuals (Volumes 2-7) the question of construction quality and safety is treated in detail. The project manager, the caretaker and the engineer must insist on quality throughout the process of planning, design, execution, operation and maintenance. Awareness of the need for quality and safety should influence the working style at all levels. **Quality management means objective control by systematic observation and measurement.** Quality monitoring and supervision should be part of the ordinary work of the project. Quality of work and site safety can be promoted using appropriate competitions and incentives. The results of quality control must be considered in the guidance of further project development.

### **Purchase of materials and services**

The procurement of raw materials and the purchase of products and services are important activities which require quality awareness and professional management. Some practical hints:

- If the locally produced or locally available material or product is suitable (and if its use will not have a negative impact on the environment) it should be preferred, even if it is slightly more expensive than imported goods of comparable quality
- Before buying, invite and compare a number of tenders
- Lifetime, secondary costs, secondary effects, running costs, service problems, dependencies, complexity or simplicity must be considered
- If possible a product should be common, known to and appreciated by the users
- Concentrate on a few reliable dealers with sufficient stock and constant supply capacity. Try to promote local dealers and traders
- Ask for an assured quality guarantee. For example, normally it is better to buy a tap of high quality and long service life than a cheap one of low quality and poor reliability.

### **Evaluation and steering**

Evaluation and steering is a permanent process. Especially at the end of planning periods and at project milestones, the relevant leaders and their colleagues evaluate the project in order to measure achievements against objectives (efficiency and effectiveness). The SWPO method is recommended for such exercises (C 5.2 and Appendix F.2). The results of the end-of-period evaluations are put into the operational plan (Figure 21). The end of year evaluation (operational plan and annual report) may result in adaptations to the phase plan.

## 5. PROJECT OPERATION AND MAINTENANCE (Item M in Figure 12)

### 5.1 Introduction

#### Overview, scope

*Houses, vehicles, farms, infrastructure like roads, water supply schemes or sanitation structures need maintenance and repairs*, because they are exposed to physical, chemical and biological wear. ***Rural populations are normally responsible for and used to maintenance work***, since sustainable operation is not possible without appropriate maintenance. The concept of a technical project, e.g. a water supply, should have been developed and decided on at least partly on the basis of implications of O+M (technology choice, local manageability, legal and political framework, financial affordability and capacity building, etc.). The O+M structure needs to be developed and introduced gradually, during the planning and implementation of a project (Figure 12). The organisation and the required management set-up for O+M (including personnel) should, as much as possible, be developed and considered from the outset of the project. This allows the inclusion of realistic and effective training and experience. Where such an organic development of O+M is neglected, projects risk encountering operational problems quite soon after the start of the operational phase. Often breakdowns and poor utilisation of water and sanitation systems are indications of technical, human and/or organisational inadequacies because insufficient attention was paid to planning for the O+M phase.

#### Constraints

Although O+M is recognised as one of the major constraints to further development of the water sector, little progress has been made in this field during the past years. The following is a ***list of reasons given for the failure of water supply and other infrastructure projects***, by participants and trainers in workshops throughout the world:

- Poor O+M structure (water maintenance committee, caretaker, community, support structure, etc.)
- Lack of facilitation/support from government
- Inappropriate technology and/or design
- Poor workmanship (construction)
- Project does not meet expectations (service standard, reliability)
- Lack of a sense of responsibility on the part of the users
- Lack of spare parts and material
- Lack of clear and realistic water tariff structure or lack of finance (insufficient revenue)
- Poor financial management
- Inadequate monitoring and evaluation
- Maintenance organisation and financial system not legally established (absence of sanctions for offences)
- Easy access to traditional (even unprotected) sources.

## Key issues

**Adequate O+M is based on a sound local capacity in the technical and managerial fields.** Even though local autonomy is a key criterion for sustainability, for small and especially for large and complex projects, **support from outside** (technical consultancy, institutional and administrative support and control combined with capacity building) is essential. **Capacity building for O+M** is not completed with the construction phase but requires follow-up that can only be phased out with increasing skill and experience on the part of the local management team. This co-operation should not lead to one-sided dependencies or to donor-receiver mentalities. A reliable supply and the benefits felt by the users are the most effective motivators for a community commitment to maintenance. O+M is not limited to the sole activity of a caretaker or a technician; it includes the activities of various actors at different levels. **O+M is not just a technical issue - it encompasses social, gender, economic, institutional, political, managerial and environmental aspects.** In O+M, the responsibility for water supply must be seen in a comprehensive, holistic sense, containing quantitative and qualitative protection and management of water resources from the natural environment, intake, storage, distribution, use and disposal. A project which has been planned, decided and executed together with the users is more qualified for sustainable O+M. **The identification, the legal ownership and the real sense of ownership of the local population are important.**

Water is being increasingly seen as an economic good, which implies that communities must pay for the water they use. Governments, because of heavy financial burdens and efficiency problems, are gradually changing their role from that of service provider to that of facilitator. Communities carry increasing responsibilities, not only in operation and maintenance of their water supply and sanitation systems, but also in financial management. Actors such as private entrepreneurs from the informal and formal sectors are also becoming more involved in operation and maintenance. **At all levels more integrated O+M strategies are being developed in which the concerns of safe water, sanitation, hygiene education and waste disposal are tackled simultaneously. Women, as the principal users of water supplies, are playing an increasingly prominent role in management and maintenance activities.**

## Definitions of operation and maintenance

**Operation** means the safe, reliable and economic use of a scheme or installation over a long period.

**Maintenance** describes the set of measures and activities aimed at maintaining, or restoring optimal and reliable functioning of schemes, machines, etc., and maintaining and protecting natural resources.

**Preventive maintenance** means measures that are taken before major problems and disturbances like breakdowns occur. In nearly all cases, preventive maintenance is the most reliable and economic maintenance strategy to adopt. However, it requires a qualified local maintenance structure.

**Curative maintenance/repairs** means a reaction to problems when they are already affecting the proper functioning of a system. The difference between preventive and curative strategies is similar in the health sector. In large and complex systems curative maintenance is very expensive and can lead to long interruptions of service. It includes also intervention in the case of ordinary failures and breakdowns (Figure 23).



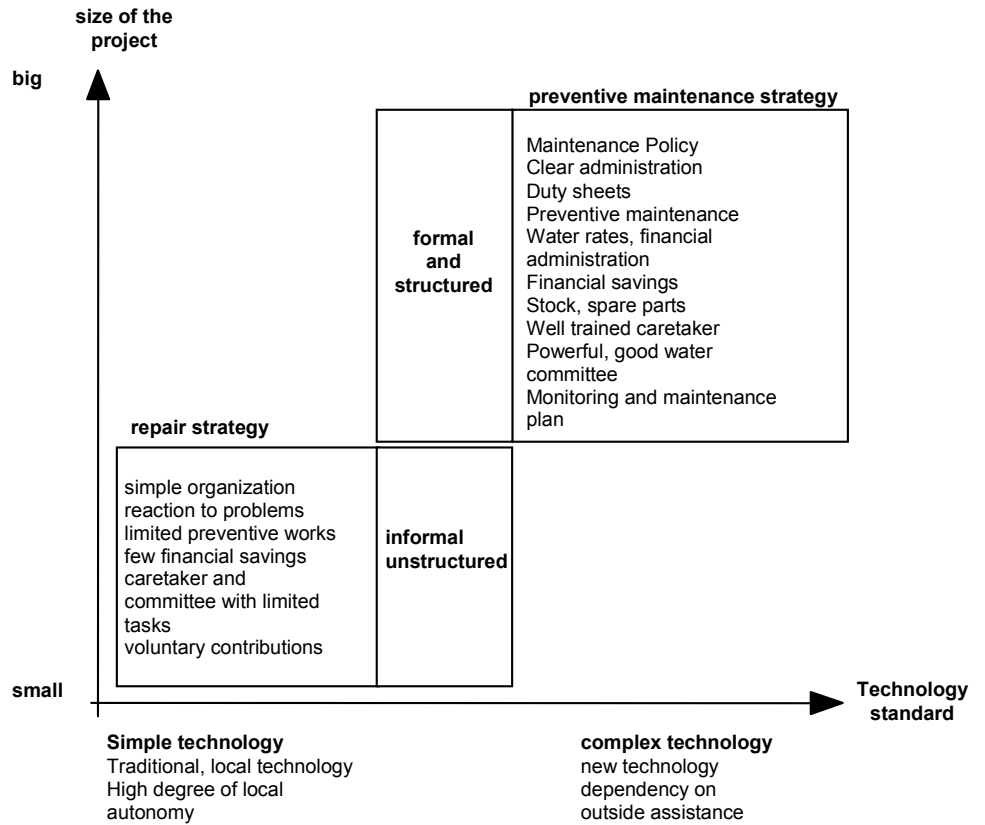


Figure 23: The two maintenance strategies

**Rehabilitation** is the renovation or replacement of major structures which have reached the end of their useful life. Rehabilitation and extension of existing systems should be treated as new projects.

## 5.2 Strategies and elements of operation and maintenance

**Main goals**

The main goals are the same as for design

Safe water	}	Health and	}	Well-being
Sufficient water		empowerment		and
Reliable supply		for all		prosperity

**Key issues**

- General **guidelines and standards for O+M are developed at national level**. They provide a legal basis and should facilitate and harmonise local O+M strategies
- Regional and national level structures (GOs, NGOs, private sector) ensure the necessary support and follow-up (**consultancy and direct assistance**)

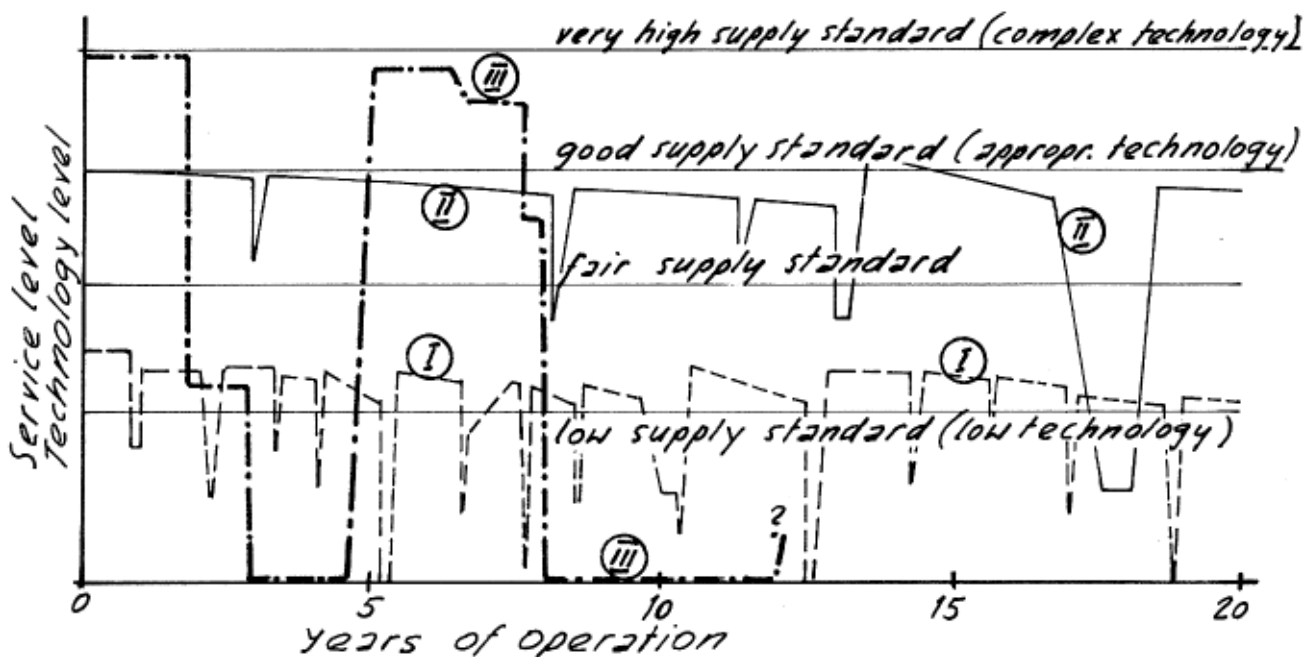
- Safety for operators, users and consumers
- Reliable functioning through fulfilment of sustainability criteria in all fields and project phases (felt need, appropriate technology, willingness and ability to pay, etc.)
- It is crucial to make a **link between the choice of technology, the type of system and long-term O+M considerations**.
- The **recognition of the social impact** of the new system, a sense of ownership on the part of the community, and voluntary community participation should be promoted and achieved during the planning and implementation phases. In particular, the issue of the empowerment of women is essential.
- **O+M including human resource development and institution building** should be prepared and developed to the required levels (qualified, adequately equipped caretaker(s), committee members, etc.). Clear responsibilities, duties and competencies.
- **Adequate follow-up after completion**, including evaluation of performance, exchange of experience and complementary training
- Each function holder has a designated substitute who can take over in case of absence
- A set of **appropriate tools/equipment** and a reasonable stock of frequently used spare parts enable the caretaker to keep the system functioning efficiently
- **O+M should be compatible with local traditions**, experiences and capacities
- The implementation structure (institutionally, technically and in terms of management) is easily transferable to an O+M-structure
- **The basic rules of democracy** (dialogue, transparency) which have characterised planning and implementation should also be applied in the O+M phase
- **Local autonomy as much as possible**, village external support (by government, NGOs or private sector) as much as needed (consultancy, direct assistance, training etc.)
- **linkages between water and sanitation; inter-sectoral and inter-institutional integration**
- **Minimisation and quick solving of problems:**
  - Avoidance of serious breakdowns
  - Repair of small damage (within the caretaker's capacity and competence) within two days
  - Repair of major damages, which requires assistance from outside, within 5 - 10 days.
- **Community is able and willing to pay the O+M fee** (Advance financing of O+M, legally approved)
- **Fair compensation of caretaker(s) and other individuals** who give ongoing contributions significantly higher than an ordinary free community contribution
- **WATSAN remains a permanently promoted topic in daily life (socially, politically, etc.).**

## Strategies

**Most of the tools for project management (Part C) are applicable also for O+M.** The respective strategies depend on three main dimensions:

- Organisation (including Human Resource Development and Institution Building)
- Finance
- Technology

For specific types of projects all these three dimensions require varying degrees of inputs. Figure 24 indicates schematically different maintenance strategies for different project options with the respective maintenance inputs.



Water scheme	Maintenance strategy	Reliability	Service standard	Maintenance efforts
① Traditional, simple water supply system	<ul style="list-style-type: none"> <li>• Minimum maintenance</li> <li>• Repair strategy</li> </ul>	<ul style="list-style-type: none"> <li>• High break-down rate</li> <li>• Easy and quick repairs with local means</li> <li>• Fair reliability</li> </ul>	<ul style="list-style-type: none"> <li>• Reasonable supply standard</li> <li>• Frequent, but short interruptions</li> </ul>	<ul style="list-style-type: none"> <li>• Frequent repairs</li> <li>• Considerable labour demand</li> <li>• Low cost</li> </ul>
② Modern village water supply scheme of good, but simple technology (gravity system)	<ul style="list-style-type: none"> <li>• Good preventive maintenance (community-based)</li> </ul>	<ul style="list-style-type: none"> <li>• Almost no break-downs</li> <li>• Short interruptions</li> <li>• High reliability</li> </ul>	<ul style="list-style-type: none"> <li>• Good service level</li> <li>• Stable because of preventive maintenance</li> </ul>	<ul style="list-style-type: none"> <li>• Ongoing small maintenance</li> <li>• Good care taking</li> <li>• Supportive project committee</li> <li>• Little cost</li> </ul>
③ Expensive high-tech scheme	<ul style="list-style-type: none"> <li>• Central agency supervision and maintenance</li> <li>• Without community involvement</li> </ul>	<ul style="list-style-type: none"> <li>• Break-downs after short time and frequent</li> <li>• Long periods of no service</li> <li>• Poor reliability</li> </ul>	<ul style="list-style-type: none"> <li>• Very high standard (if functioning)</li> </ul>	<ul style="list-style-type: none"> <li>• Inadequate maintenance and repair structure</li> <li>• Involvement of population impossible</li> <li>• Very expensive</li> </ul>

Figure 24: Different service levels/technologies, maintenance inputs and reliabilities

The organisational structure is similar to that for implementation. As much as possible - even more than during construction - management should be based in the community. In most cases (if the project committee works well) it is recommended that the project committee will be transformed into the operation and maintenance committee. Often a governmental body (e.g. district water engineer's office) retains a technical supervisory function. The financial side too can be supervised by a government service.

***Organigrams and duty sheets as well as committee regulations need to be worked out and approved by the general assembly of the user community as well as by other permanent project partners.***

As indicated earlier, a good quality of construction (raw material, mechanical equipment, design quality and workmanship) is essential for subsequent operation and maintenance. Low standards of workmanship (not of technology) cause frequent breakdowns and call for repairs at short intervals. High quality construction work, on the other hand, ensures good and reliable functioning with relatively low maintenance, but requires a higher initial investment. What is the ideal situation? Experience shows that in most cases higher investment is justified for reasons of quality/reliability and simplicity of a system. Moreover ***the willingness to contribute for O+M increases with the reliability of supply***. It has been observed that users are more inclined to maintain their system after they have been accustomed to a reliable supply for some years. However, this learning can only be effective if it is coupled with a professional follow-up by a support agency. In very small and simple projects, purely based on local material and local technology, a higher breakdown rate can perhaps be acceptable. It could even be advantageous because the user community remains aware of their water supply or sanitation system. However, in larger, more technical and complex projects breakdowns often last for long periods and repairs are expensive. Such problems can be avoided by two types of effort:

- ***Large technical projects should be as conceptually simple as possible***, built with material of good quality (appropriate design, good supervision of work, ensuring high quality in construction).
- A proper ***maintenance regime*** should be ensured in order ***to avoid or minimise serious damage through a strategy of prevention***. Protection against corrosion and repair of small damage is a key element of preventive maintenance. This strategy must be based on and related to a maintenance plan.

### **Capacity building**

(Steps H - M in Figure 12)

The methods and the tools for Human Resource Development and Institutional Development are explained in C 6. Capacity building for the O+M phase should begin early in the project. It is helpful when the caretaker and some of the committee members of the operation phase are trained and become familiar with the project during construction. Figure 25 shows how ***the preparation for O+M goes on throughout all project phases***. When a scheme goes into operation the training support remains a vital part of the follow-up. From experience it is known that the gaining of experience (on-the-job training) needs 5 to 10 years until an O+M structure works optimally. After this initial phase periodical refresher training is recommended. The horizontal exchange of experience among committees and caretakers of different schemes is also a very efficient method of learning and improving performance.

### 5.3 Organisation and management

#### Scope

The basics of project management (A 4) refer also to the operation and maintenance phase, and the tools (Part C) are the same for planning, construction and operation. The main tasks of O+M are listed in Figure 25, which shows how the technical and the administrative handing over of management functions links the construction phase with O+M. Such handing over of functions and competencies requires formal confirmation. The construction structure is terminated and the new O+M structure is introduced. This transition has nothing to do with ownership, which should be the users' from the beginning. It should not happen that local empowerment begins only with the formal taking over of the responsibilities for O+M.

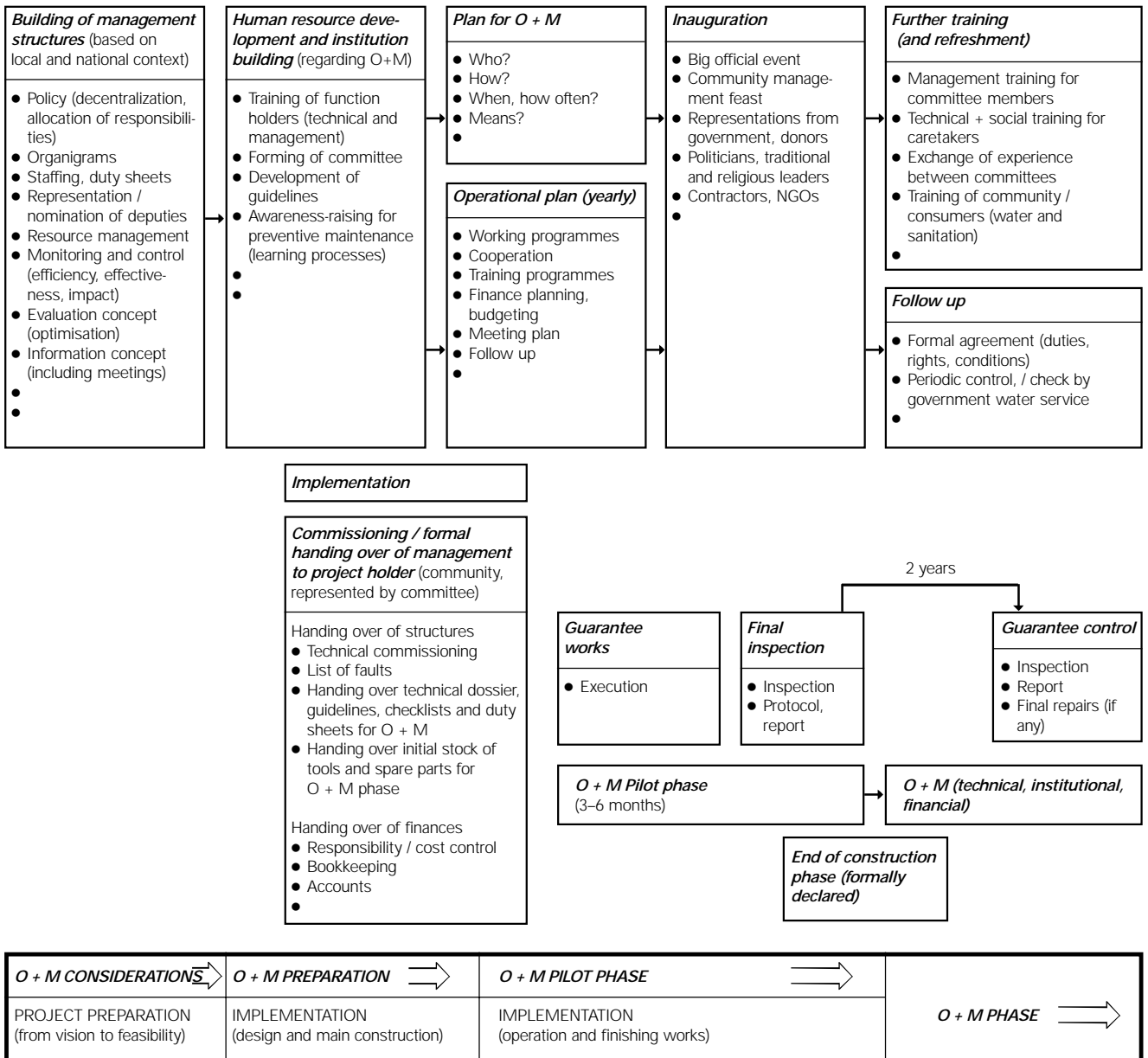


Figure 25: Operation and maintenance starts with the project idea

As already stated the organisation and management system for implementation should be as much as possible in line with the required structures for O+M. Hence the handing over is more a formality than a transfer of functions from one institution or group of people to another. For a discussion on formal handing over arrangements see Section 4.3 and Table 12.

### **Typical O+M - management systems**

#### ***External management (agency managed, top-down)***

State- or privately owned schemes are operated by external bodies; the local community fulfils only the role of consumer, without any direct opportunity to influence technical or marketing decisions. Therefore the interest of the local people is limited to the consumption of the product, water.

If the government runs water and sanitation systems the risk is high that local needs and potentials are not considered and are consequently under-exploited. In the case of external private sector management (and ownership) there is a risk that the only motivation is profit. Ecological and social considerations might be neglected. Shortages of spare parts, tools and vehicles can result in long periods of breakdown.

#### ***Community based management***

***The operation and maintenance of small and medium sized water supply and sanitation projects are ideally suited to community based management (CBM).*** Such decentralised forms of management are described in [A 2.3](#) and [A 3.2](#). CBM goes beyond participation; it puts the owners/users in charge of their system. CBM is also open to long-term and flexible partnership with support agencies (NGOs, government, and private sector). It strengthens the capacity of the local institution and individual partners as well as contributing to social self-confidence and community spirit. ***Positive experiences in CBM will have extended benefits for other development activities.***

The management principles and methods are the same as for the construction phase. The relevant tools are described in [Part C](#), e.g. financial management in [Section 4.4](#) and [C 7](#).

### **Actors and their typical roles (O+M phase)**

Typical roles of different stakeholders in community based management systems are described below. Some of the activities assigned to one actor may be handed over to another one (e.g., communities in which the majority of people are in regular employment may contract the private sector for maintenance activities).

#### ***Role of the community (water committee)***

The maintenance committee, together with the external support structure (government and/or NGOs, private sector) develops and occasionally adapts the regulations for O+M. In a large system two levels of maintenance committees might be necessary at village and branch or area level. The duties of O+M committees must be specified in accordance with national policy. Duties are divided between those which are exclusively the village's own responsibility and those which are beyond local capacity, shared with the maintenance technician from a village external support agency (government or private sector).

*Local responsibilities should at least include institutional and financial management, watershed management, regular cleaning of the entire scheme and maintenance and repair of village stand pipes, aprons, drainage channels, etc.* In addition, the users of the land through which pipelines pass should be responsible for ensuring the lines remain adequately marked and protected from erosion.

The responsibilities that the communities (committee including caretaker) share with the external maintenance technician include general surveillance, the maintenance of pipelines and wells, and the emergency repair of leaks. In all these activities the committee is expected to organise voluntary labour to work under the supervision of the maintenance technician.

A checklist for statutes of a water committee, representing all local groups, is presented in Table 13. The community itself (the population) is asked to use the structures properly and optimally, to pay the agreed consumer rates and to support the committee and the caretaker with voluntary labour as the need arises.

### ***Role of the caretaker(s)***

A village external maintenance technician normally has to cover a number of systems spread over a manageable region. It may take days before s/he receives a message and even longer for him/her to reach a trouble spot. Therefore it is necessary to train one, or preferably two, members of the maintenance committee ***to carry out maintenance and repair functions***. The caretaker(s) should be identified and nominated during the planning of the project by the project committee. They should then work alongside the field technicians and engineers during construction so that they can become familiar with the layout of the system and learn the skills required repairing or replacing pipes and fittings. On-the-job experience is very useful, but it cannot replace appropriate formal training for caretakers. On completion of the project they should be given a detailed O+M routine (duty sheet, job description - see example Table 14). Selection criteria for caretakers are:

- reliable and respected person with permanent residence in the area, well established
- already has other sources of income
- mobility and ease of access
- high personal motivation for the work
- able and willing to keep records
- previous technical experiences or clear interest and aptitude during training.

There are many examples where women have best met the above mentioned criteria and act successfully as caretakers.

***The caretaker is a key person who needs appropriate tools, spare parts and possibly transport facilities. S/he is a member of the maintenance committee,*** depending on the full support from and dialogue with the committee. For his/her special work the person is entitled to fair compensation.

### ***Role of village external support (government, private sector, NGOs)***

The support of the village (Section 1.3) can be covered by government agencies and/or by the private sector or NGOs, according to their typical tasks or optional roles.

***In the case of water and sanitation, a maintenance technician or area mechanic can be the most important representative of the support structure.*** He or she must provide the necessary follow-up (support in technical, administrative and social aspects as well as in monitoring). Such persons play an important and a creative role: they must find the right degree of contact with the local project holders in order to offer optimal facilitation and support. Inter-sectoral co-ordination, administrative control, management support and training are often areas where external persons or institutions may come in. The support structure should be on the basis of continuity over a long period of time (enhancing the development of mutual trust).

Ghana has had a positive experience with a bonus system for preventive maintenance. Villages carrying out regular and successful preventive maintenance benefit from repair services at subsidised rates. There are many possible forms of incentive, which can stimulate competition among communities.

In a maintenance-seminar in Cameroon the idea of creating mobile support teams was born. Such teams should contain two people: a technician/plumber and a community worker. Means of transport are of great importance for such a team, because the technicians need to take along tools and materials. The vehicle has to serve as a simple 'flying workshop'. With regular and frequent visits (about once a month) emerging questions can be discussed. In cases of emergency the team can be called for immediate action. However, the service, which could be governmental, non-governmental or private, has to concentrate on the strategy of 'help to self-help'. Such services should not be offered and rendered to villages 'automatically'. Only those who fulfil the following conditions can expect such support:

- Regard for sustainability criteria
- Attendance at training for local capacity building
- Introduction of water rate system including remuneration of caretaker
- At least part-payment for external assistance (to prove real interest).

This has to be confirmed in an official agreement.

***Support teams of this nature can hardly function without financial assistance. That means that operation depending purely on the involvement of a private contractor would probably not be realistic.*** The pre-conditions for full financial independence and self-sufficiency could make the services unaffordable. One of the reasons is high transport costs (long distances on bad roads). Without financial assistance the risk might arise that such teams would concentrate on new construction and extensions for villages and individuals, and their interest in preventive maintenance and operational consultation would decline. Therefore subsidies from government or from private donors (NGOs) are necessary (tools, vehicles, spare parts, salaries and other running costs). However, the local contribution has also to be adequate and high enough in order to show the villagers' interest. The success of such a programme depends mainly on the personal qualifications and motivation of the support team. Therefore highly qualified people should be appointed for this challenging job. The support teams would have to be free from other duties in order to concentrate fully on their obligations.

According to the description above the role of government can be more or less intensive. However, the government must retain some basic involvement by providing at least minimal financial support and the creation of a legal system promoting community based management and sustainable, fair water distribution.



## 5.4 *Monitoring, information/documentation and evaluation*

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### ***Introduction***

Monitoring, information/documentation and evaluation are very necessary to achieve effectiveness in the O+M phase. The reasons, principles, tools and strategies are the same as described under [Section 5](#) and [C 4](#). The parameters, the precision and the intervals need to be defined and recommended by the respective technicians and function holders who have planned a project.

### ***Monitoring***

***Regular routine monitoring is done by the local committee, mainly by the caretaker. Global monitoring and evaluation can be done in follow-up visits by an external support structure, in collaboration with the local team.*** Table 16 shows a form for monitoring and rating which is used in a water and sanitation programme of the Community Development Department in Cameroon for general checks. The results of two or three visits can be shown on the same paper - steering effects and trends become clear. Comments explaining the rating positions can be given on separate sheets. It is important to ensure checks and balances to improve the quality of the monitoring. This means that it is useful to have more than one method or strategy of collecting or checking data (i.e., there is more than one source of information).

### ***Documentation***

***A Properly arranged and structured project documentation is necessary*** because a project or a scheme is not only subject to routine maintenance but also to repair and overhaul, to extensions and modifications. Therefore it is very important to keep all project data and information such as location and construction plans, hydraulic profiles and calculations for design and cost estimate as well as legal documents, minutes of important meetings and notes of discussions and decision-making in a safe place. Originals or copies of these documents have to be kept in the office of the execution bodies.

### ***Guidelines***

The technical and the administrative bases for O+M (guidelines, checklists, tasks, etc.) need to be developed by the technical and the administrative project teams, in consultation with the community and the village external support agency. Their recommendations will be integrated into the management structure of O+M.

Village / project: **Mbakang WS** Dates: **12.03.96 o**Division: **Manyu** **14.02.98 x**

Responsible persons for Monitoring: .....

**Edwin Visi, CDD technician** .....**Jacob Awunti, Caretaker** .....**Example**

No	SECTORS, PARTS, INDICATORS	Rating	5	4	3	2	1
00	MOTIVATION AND PARTICIPATION						
01	Clean water is highly valued by the users			XO			
02	Users show interest in water scheme			X	O		
03	Users pay water rates, collected by committee			X		O	
10	PERFORMANCE OF WATER MAINTENANCE COMMITTEE						
11	WMC is functioning and active			X	O		
12	WMC is integrated in existing village structure			X	O		
13	WMC and caretaker's duties are clearly defined and known				X		O
20	FUNCTIONING AND SERVICE LEVEL OF SCHEME						
21	Catchment			X	O		
22	Water tanks, chambers			XO			
23	Slow sand filters, other filters				X	O	
24	Public standpipes and wash places		X		O		
25	Pipelines with valves and chambers			X	O		
30	PROTECTION OF CATCHMENT AREA						
31	Catchment area is well protected			O	X		
32	Soil erosion in watershed and intake area is under control			O		X	
40	WATER QUALITY / QUANTITY / ACCESSIBILITY						
41	Water is clean, appearance of water born diseases reduced			XO			
42	Water quantity is enough for bathing and washing clothes			XO			
43	Enough taps well distributed all over the village			XO			
50	SOCIAL ASPECTS AND WOMEN'S PARTICIPATION						
51	Nobody is affected in a negative sense by the scheme		O	X			
52	Women participate in O+M activities			OX			
53	Women are in WMC key positions			X	O		
60	MAINTENANCE PROGRAMME IMPLEMENTATION						
61	Concept and importance of O+M is clear to villagers			X		O	
62	Finance scheme of O+M is established and functioning				XO		
63	Funds available for spare parts and CT's compensation				X	O	
64	Figures for income and expenditure available (transparency)			X		O	
65	Regular monitoring by CDD or NGO technicians				X	O	
66	Monitoring data is complete for evaluation				O	X	
70	PERFORMANCE OF CARETAKER (CT)						
71	CT is trained			X	O		
72	CT is working well			O	X		
73	CT is compensated for his work				O	X	
74	CT has complete toolbox		X		O		
75	CT has enough spare parts on site		X		O		
76	CT has the necessary transport means			X	O		
	TOTAL				O 96 (1996)	X 114 (1998)	

UF; 07/00

Rating: above 110 = very good, 80 – 109 = good, 60 – 79 = fair, 35 – 59 unsatisfactory  
below 35 = poor

Table 16:

**Monitoring and rating for water supply projects – an example from Cameroon (Form Appendix M. 9)**

**Evaluation of O+M on national level**

Despite increased awareness at the international level, ***national governments often do not give sufficient priority to maintenance***. This is to a great extent due to the lack of country-level information on the functioning of rural water supply facilities and the cost of existing maintenance practices. ***A review and systematic evaluation of current maintenance practices at national level is an essential starting point for creating greater commitment and stimulating awareness of the need for suitable maintenance systems***. Preferably, these studies should be carried out by national staff with the support from donor agencies.

## 5.5 Risks, challenges

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**Challenges**

Some reasons for general and specific O+M problems and important conditions for successful O+M are mentioned in [Section 5.1](#) to [Section 5.3](#).

**Political and administrative risks**

- Too much political interference, i.e. promised provision of free water, which makes autonomy and sustainability difficult to achieve
- Governments and external support agencies (ESAs) neglect the maintenance of existing supplies in favour of focusing on capital-intensive construction and expansion
- Poor management and overlapping responsibilities within projects and agencies, diverting funds away from O+M
- O+M too centralised
- Irregular and sporadic maintenance due to political and social conflicts
- Communication and transport do not function well.

**Management, market and technology**

- In the case of poor working quality or lack of payment discipline, no effective sanctions are applied
- Experiences are not shared among villages
- Spare parts and tools of good quality at reasonable price not available
- If parts of a project are used before the scheme is terminated entirely, there is a considerable potential for conflict. There is a risk that users who benefit before the final handing over refuse to participate in and contribute to the completion of the project.



## TABLE OF CONTENTS PART C

<b>Part C:</b>	<b>Methods and Tools for Project Management .....</b>	<b>99</b>
	<i>Scope and capacity of management tools .....</i>	99
	<i>Key objectives for management .....</i>	99
<b>1.</b>	<b>MAKING DECISIONS .....</b>	<b>100</b>
	<b>1.1 Introduction .....</b>	<b>100</b>
	<i>The meaning of decision making .....</i>	100
	<b>1.2 Quality requirements for decision making .....</b>	<b>100</b>
	<i>Decide clearly, definitely and officially .....</i>	100
	<b>1.3 The decision making process and tools .....</b>	<b>101</b>
	<i>Preparation of decisions .....</i>	101
	<i>Meetings for decision making .....</i>	102
	<i>The decision making tree .....</i>	102
	<i>Spheres of influence .....</i>	103
	<i>Brainstorming and participatory rural appraisals .....</i>	103
	<b>1.4 Practical hints .....</b>	<b>103</b>
	<i>Decision making and empowerment .....</i>	103
	<i>Flexibility .....</i>	103
	<i>Decisions are rational and emotional .....</i>	103
	<i>Decisions by those directly concerned .....</i>	104
	<i>Reconsideration of decisions .....</i>	104
<b>2.</b>	<b>WATER AND SANITATION KNOWLEDGE SYSTEM (WSKS) .....</b>	<b>104</b>
	<b>2.1 Introduction .....</b>	<b>104</b>
	<i>Purpose .....</i>	104
	<i>Main fields of application .....</i>	104
	<b>2.2 Elaboration and use of the WSKS .....</b>	<b>105</b>
	<i>Stakeholders .....</i>	105
	<i>Positions, roles .....</i>	105
	<i>Interacting processes .....</i>	106
<b>3.</b>	<b>PLANNING TOOLS .....</b>	<b>106</b>
	<b>3.1 Introduction .....</b>	<b>106</b>
	<i>Purpose and scope of planning .....</i>	106
	<i>Planning horizons .....</i>	107
	<i>Key dimensions for holistic planning .....</i>	107
	<i>Principles of planning .....</i>	109
	<i>Practical hints .....</i>	109
	<b>3.2 Sector Planning .....</b>	<b>110</b>
	<i>Purpose, content .....</i>	110
	<i>Process .....</i>	110
	<i>Practical example .....</i>	110
	<b>3.3 Project planning steps, conditions and tools .....</b>	<b>112</b>
	<b>3.4 The MEPI cycle .....</b>	<b>114</b>
	<i>Monitoring Evaluation Planning Implementation .....</i>	114
	<b>3.5 Phase planning .....</b>	<b>114</b>
	<b>3.6 Operational plan .....</b>	<b>114</b>
	<b>3.7 Water Resource Management .....</b>	<b>115</b>
	<i>Purpose .....</i>	115
	<i>Ecological objectives for planning (see also A 2.2) .....</i>	115
	<i>Key tasks and duties .....</i>	115
	<i>Practical hints .....</i>	116
	<b>3.8 Environmental impact assessment (EIA) .....</b>	<b>116</b>
	<i>Purpose .....</i>	116
	<i>How can the parameters and the area of consideration be defined? .....</i>	116

	<i>What is the ecological capacity of a project area?</i> .....	117
	<i>Environmental Monitoring</i> .....	118
	<i>Planning of supportive measures</i> .....	118
<b>4.</b>	<b>TOOLS FOR IMPLEMENTATION</b> .....	<b>120</b>
4.1	<i>Introduction</i> .....	120
	<i>Purpose - Scope</i> .....	120
	<i>Main tasks</i> .....	120
4.2	<i>The operational plan</i> .....	121
	<i>Scope and purpose</i> .....	121
	<i>Elaboration and use</i> .....	121
	<i>Possible structure and contents</i> .....	121
	<i>Practical hints</i> .....	122
4.3	<i>Specific implementation tools</i> .....	122
4.4	<i>Management of personnel</i> .....	123
	<i>Purpose and scope</i> .....	123
	<i>Recruitment</i> .....	123
	<i>Job description</i> .....	123
	<i>Representation or replacement in case of absence</i> .....	123
	<i>Discipline</i> .....	123
	<i>Practical hints</i> .....	124
<b>5.</b>	<b>DATA AND INFORMATION MANAGEMENT</b> .....	<b>124</b>
5.1	<i>Information and communication</i> .....	124
	<i>Purpose - Scope</i> .....	124
	<i>Quality criteria for an information and communication system</i> .....	125
	<i>Promotion of a favourable climate for communication</i> .....	125
	<i>Communication through meetings</i> .....	126
	<i>Information media</i> .....	126
5.2	<i>Monitoring and evaluation</i> .....	127
	<i>Purpose, scope and definitions</i> .....	127
	<i>Key objectives for M+E</i> .....	128
	<i>The actors and their roles</i> .....	128
	<i>Indicators / parameters</i> .....	129
	<i>Types of evaluations</i> .....	130
	<i>Planning and implementation of MEPI</i> .....	130
	<i>Monitoring technique</i> .....	131
	<i>Reporting - a monitoring instrument</i> .....	132
	<i>SWPO-method</i> .....	134
	<i>Participatory rural appraisal (PRA)</i> .....	135
	<i>Practical hints for M+E</i> .....	135
5.3	<i>Documentation and filing system</i> .....	136
	<i>Preparation of data and information</i> .....	136
	<i>Documentation and filing</i> .....	136
	<i>Photographic documentation</i> .....	139
	<i>Practical hints</i> .....	139
<b>6.</b>	<b>HUMAN RESOURCE AND INSTITUTIONAL DEVELOPMENT (HRD + ID)</b> .....	<b>141</b>
6.1	<i>Introduction</i> .....	141
	<i>Purpose - Scope</i> .....	141
	<i>Main ideas of HRD and ID</i> .....	141
	<i>Key objectives</i> .....	142
6.2	<i>Concepts for HRD and ID</i> .....	142
	<i>Analysis of the existing situation and training needs</i> .....	142
	<i>Assessment of HRD + ID needs</i> .....	142
	<i>New approaches require new skills</i> .....	143
	<i>Checklist for working out of training programmes</i> .....	143
	<i>Community training</i> .....	144

6.3	<i>Moderation technique</i> .....	145
	<i>Purpose - Scope</i> .....	145
	<i>Objectives of moderation</i> .....	146
	<i>Determining factors</i> .....	146
6.4	<i>Training and teaching-techniques and methods</i> .....	147
	<i>Purpose - Scope</i> .....	147
	<i>Principal methods</i> .....	147
	<i>General rules for teaching/training</i> .....	148
	<i>Logical framework for HRD-concept</i> .....	149
	<i>Course and lesson preparation</i> .....	149
	<i>Teaching aids</i> .....	150
	<i>Characteristics of visualisation</i> .....	151
	<i>PRA-method</i> .....	152
	<i>Informal methods</i> .....	153
	<i>Follow-up</i> .....	153
6.5	<i>Practical hints / Checklist for HRD and ID</i> .....	153
7.	<i>ECONOMIC RESOURCE MANAGEMENT</i> .....	154
7.1	<i>Introduction</i> .....	154
7.2	<i>Willingness and ability to pay</i> .....	154
	<i>Purpose - Scope</i> .....	154
	<i>WTP and ATP are susceptible to change</i> .....	154
	<i>Key objectives</i> .....	155
	<i>Tools for WTP/ATP assessment</i> .....	155
	<i>Steps of a WTP/ATP study</i> .....	155
	<i>Questionnaire and interviews</i> .....	156
	<i>Practical and methodical hints</i> .....	156
	<i>Limitation of WTP/ATP studies</i> .....	158
7.3	<i>Water pricing and tariff models</i> .....	159
	<i>Purpose</i> .....	159
	<i>Cost Recovery</i> .....	159
	<i>Tariff options</i> .....	159
	<i>Higher price for yard and house taps</i> .....	160
	<i>Credits</i> .....	160

## Figures

---

Figure 26:	From milestone to milestone - a strategy for reaching targets .....	99
Figure 27:	Decision making tree for a water supply system – an example .....	102
Figure 28:	Spheres of influence and activities .....	103
Figure 29:	The water and sanitation knowledge system, WSKS (Form Appendix M. 10) ....	105
Figure 30:	Planning horizons .....	107
Figure 31:	The four key dimensions of holistic planning .....	107
Figure 32:	Planning steps in the project cycle (diagram by SDC).....	112
Figure 33:	What growth really means .....	118
Figure 34:	Management tasks for project implementation .....	120
Figure 35:	The transmission of information (a model of communication) .....	125
Figure 36:	The dimensions of information (AGUASAN workshop 1991) .....	125
Figure 37:	Basic elements of monitoring (Form Appendix M. 16) .....	130
Figure 38:	The SWPO method (Form Appendix M. 17) .....	134
Figure 39:	Graphs, diagrams instead of tables .....	137
Figure 40:	The steps of a training concept/programme .....	144
Figure 41:	Development of (inter-)action and control during a training session .....	146
Figure 42:	How to maximise the learning effect .....	148
Figure 43:	Examples of charts .....	152
Figure 44:	Flow chart of willingness to pay - bidding game .....	157

## Tables

---

Table 17:	Nature and importance of decisions .....	101
Table 18:	The variety of planning tools / guidelines (Form Appendix M. 12) .....	108
Table 19:	Sector plan / organisation / HRD + ID concept – an example of a village water supply programme, Cameroon .....	111
Table 20:	A view of planning steps, conditions and respective tools (Form Appendix M. 13) .....	113
Table 21:	Matrix of causes and effects (environmental impact assessment) (Form Appendix M. 14) .....	117
Table 22:	Watershed management – supportive measures for a rural water supply programme in Cameroon (Form Appendix M. 15) .....	119
Table 23:	Information media .....	126
Table 24:	Reporting system – an example from Cameroon .....	133
Table 25:	Filing system – an example from Kenya (Form Appendix M. 18) .....	138
Table 26:	Types of training and target audiences .....	145
Table 27:	Teaching methods (Form Appendix M. 20) .....	148
Table 28:	Logical framework for HRD-activities, from GOPP/ZOPP (Form Appendix M. 19) .....	149
Table 29:	Checklist for training preparation .....	150
Table 30:	The real costs of credits .....	160



## Part C: Methods and Tools for Project Management

### Scope and capacity of management tools

Management as defined in Part A, is more than organising ongoing processes. Preparation, planning and evaluation of projects are integral parts of project management. Management tools are intended to support and facilitate management activities.

### Key objectives for management

Modern and socially acceptable management should mean:

- to organise, direct and **control processes systematically**, optimally and fairly, according to a plan with clearly defined objectives
- to direct a project **from milestone to milestone** (Figure 26)
- **to integrate and co-ordinate the project activities** (inter-sectoral, interdisciplinary, inter-institutional)
- to define and **allocate duties and responsibilities with adequate competencies** (agreements, contracts)
- the **encouragement of all partners** to become informed and interested and to feel empowered and responsible
- to make **best use of any available** and appropriate institutional and material **resources**
- the **consideration of external conditions**, e.g. legal and political framework, environmental and other factors which cannot be influenced directly by the project
- to make persons and organisations participating in the project **capable of continuing the activities** on their own after the project has phased out
- to act according to the users' demands, **developing ownership** from the beginning
- **to train the users** in management, preferably through participation on-the-job

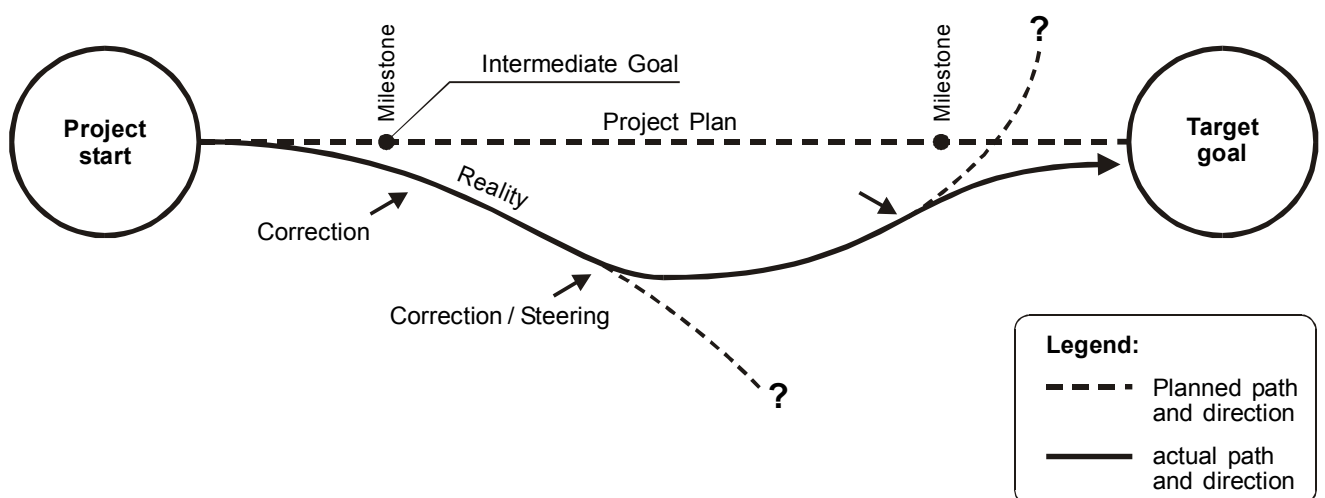


Figure 26:

*From milestone to milestone - a strategy for reaching targets*

# 1. MAKING DECISIONS

---

## 1.1 Introduction

---

### *The meaning of decision making*

Management activities are closely linked with decision making. Therefore most management tools are used to produce and introduce facts and data as a basis for arriving at opinions and decisions. Decisions are steps taken in transforming ideas into reality.

***Decision-making, and hence management, is not new to any society.*** Communities and families have always managed traditional resources like labour, water, land, economy, household, etc. Therefore tools need to be developed from or adapted to local experiences, in keeping with the abilities, needs and perceptions of local partners.

Once developed and applied, the tools need to be monitored and optimised step by step according to the users' experiences.

***Decision-making means choosing between alternatives.*** Uncertainties and conflicts often hamper decisions. These should be minimised through consideration of adequate information (internal and external aspects). Decisions which need to be made should not be delayed.

## 1.2 Quality requirements for decision making

---

### *Decide clearly, definitely and officially*

Important decisions (e.g., agreements) need to be taken clearly and with the full participation and awareness of the people concerned; they must be confirmed in writing, having contractual importance and meaning. The majority and minority situations about voting, the date, the place of decisions, etc. need to be recorded.

***Decision making competencies need to be discussed and allocated/delegated explicitly*** and according to the nature of the decision concerned, perhaps *in terms of the following hierarchy*:

- Important general decisions (conceptual, political, financial, organisational, and institutional)
- Project planning and design decisions
- Project implementation decisions
- Project operation and maintenance decisions

In all decisions related to objectives and main goals the project-holder community must be involved, whereas decisions concerning implementation and execution can be delegated to the implementing bodies.

***In any case, decisions need to be comprehensively documented.***

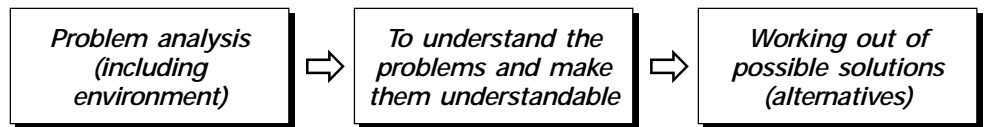
***Proper decisions depend on:***

- An unambiguous allocation of decision-making power
- Full, fair, honest, realistic and transparent preparation/information/documentation
- Sound and understandable basis for arguments / clear formulation of and decision about certain requests or proposals
- Communal decision-making (consideration of the groups and individuals concerned, especially women)
- Clear, just, explicit decisions

- Knowledge/awareness about expected benefits and costs including secondary consequences of a certain decision (e.g. investment and running costs, community labour and management, dependencies, remaining risks)
- The right time to make a decision (not too soon, not too late)
- A sound basis of factors and arguments for the decision

### 1.3 The decision making process and tools

Decisions should be based on three elements:



#### Preparation of decisions

Decisions require preparation in all related fields (social and institutional aspects, economy, technology, rules and regulations, ecology). The amount of preparation put into the making of a particular decision will depend on the type and importance of the decision (Table 17).

Nature of decisions	Requirements	
	<ul style="list-style-type: none"> <li>■ intensive preparation</li> <li>■ broad consent</li> <li>■ democratic decision</li> <li>■ formal decision</li> </ul>	<ul style="list-style-type: none"> <li>■ easy preparation</li> <li>■ individual or small group decision</li> </ul>
■ Definite decisions	×	
■ Provisional decision		×
■ Long-term decisions	×	
■ Short-term decisions		×
■ Reversible decisions		×
■ Irreversible decisions	×	
■ Important key decisions	×	
■ Secondary decisions		×
■ Expensive decisions	×	
■ Inexpensive decisions		×
■ Goal-influencing decisions (conceptual)	×	
■ Work-oriented decisions (management)		×
■		
■		
■		

Table 17: Nature and importance of decisions

Evaluations and analysis should be decision-oriented in order to facilitate the processes. Alternative solutions should be presented and compared objectively.

**Meetings for decision making**

Formal and informal meetings and discussions are the most common tools for decision making. The participants need first to agree verbally on a decision. Afterwards it is put down in the minutes of the meeting so that it can be followed up and implemented. **A community decision is the sum of individual pre-decisions.** The following questions may help for personal decisions:

- Is my decision or vote made freely without external force? Do I feel good about it?
- What are the consequences (advantages and drawbacks) of my decision? Did I make the decision after examining all possible options?
- Is the decision taken in full awareness of and according to our roles and values (as a community)?

**Meetings for decision making help to:**

- acquire and impart as much information as possible about all relevant topics
- explore as many options as possible
- know the costs, benefits, advantages and disadvantages of the various options

**The decision making tree**

Complex problem/decision chains can be visualised with so-called decision making trees (Figure 27). Such diagrams are suitable not only for making decision chains visible but also for comparing alternative programme concepts.

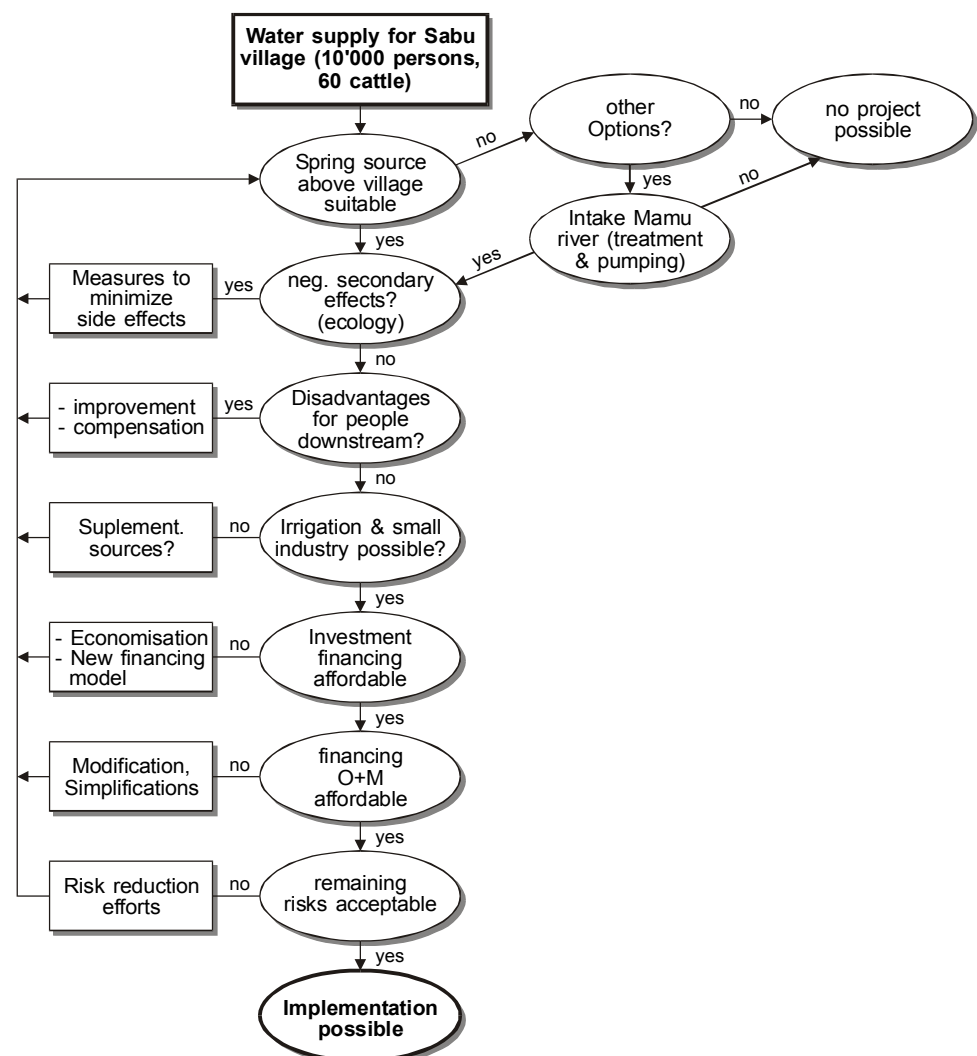


Figure 27: Decision making tree for a water supply system - an example

**Spheres of influence**

Activities are most efficient and successful when people act within their spheres of influence and decision making capacity. These spheres can be defined and optimised through discussions on the basis of Figure 28.

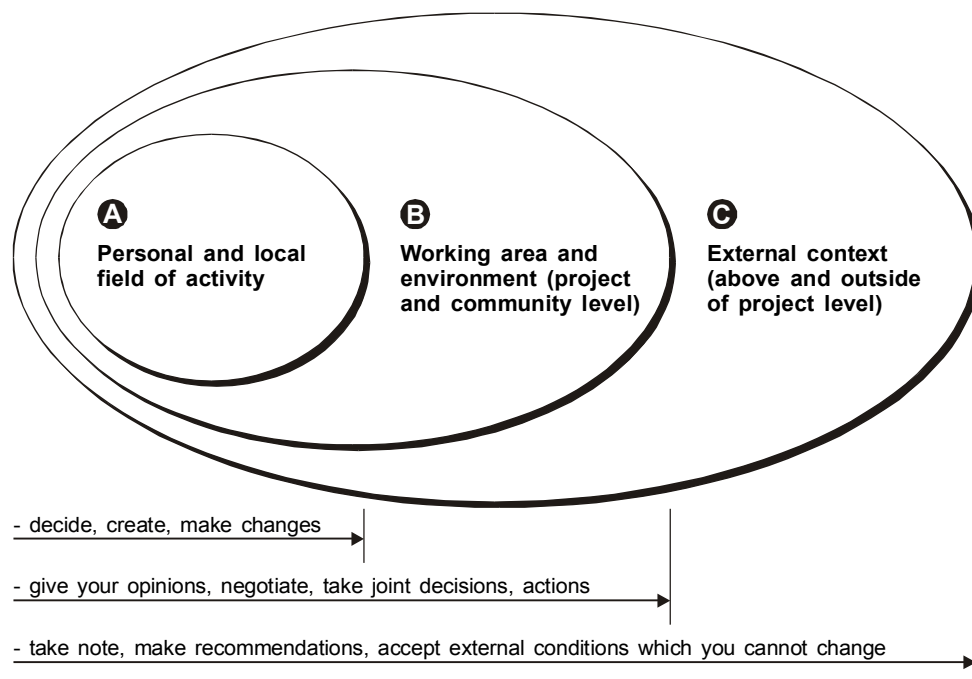


Figure 28: **Spheres of influence and activities**

**Brainstorming and participatory rural appraisals**

These two participatory tools are introduced in [Section 3](#) and [Appendices G](#) and [H](#). They are useful for a sound preparation of accepted and supported decisions.

**1.4 Practical hints**

**Decision making and empowerment**

**Decision making processes reflect the degree of participation, sense of ownership and power sharing.** Communal decision-making indicates a strong sense of local responsibility. This is one of the key criteria for sustainability. Decision-making should also involve women. In many societies, women lack education and literacy, often for cultural reasons, but this should not be allowed to prevent them from active participation in community decision-making.

**Flexibility**

Decisions must give clear orientation. However, flexibility to react to unexpected developments should not be reduced.

**Decisions are rational and emotional**

Meetings and decision-making processes should take place in an atmosphere which promotes the acceptance of different views. **Decisions should be rational, but should acknowledge any emotional dimensions (feelings, fears etc.).**

**Decisions by those directly concerned**

Water supply and solid waste disposal systems are generally *collective* installations, whereas latrines are usually *individual* or *family* systems. The manner in which such projects are evaluated and decided upon by individuals or by the community may differ considerably from one situation to the next.

**Reconsideration of decisions**

If a decision was not ideal, or even wrong, it should be possible to correct it within a transparent and well-documented process of reconsideration.

## 2. WATER AND SANITATION KNOWLEDGE SYSTEM (WSKS)

---

### 2.1 Introduction

---

**Purpose**

The water and sanitation knowledge system (WSKS) created by the AGUASAN group [29] is a working instrument for:

- **Identification and systematic arrangement of the interacting stakeholders** including private and public/communal actors, their position of interest and the relevant processes in order to make relationships transparent
- **Optimisation of interacting processes** (transmission of knowledge, flow of finances, materials, etc.)
- **Identification of tasks and responsibilities** and allocation and localisation of processes and actions
- **Elimination of gaps and bottlenecks** (with regard to partners and/or activities)
- **Identification of territorial, political, administrative or hierarchical conflicts or problems**

This group dynamic tool ([Appendix E](#)) can be developed together with the stakeholders and can be applied in all phases of a project. It provides an opportunity to discuss and clarify structural conditions and links.

The results are normally presented using matrix tables (Figure 29) showing the stakeholders (actors, users) and showing clearly their interdependencies.

**Main fields of application****Quick survey**

Using the WSKS provides a quick survey about a project or programme or about specific aspects of it. The roles of the main actors, weak points or bottlenecks can be identified and recognised.

**Clarification of links, roles and responsibilities**

The WSKS provides a common and systematic basis for understanding in complicated and even conflictual situations. The varying viewpoints become evident, which is a prerequisite for reaching an agreement.

**Identification of key actors**

The WSKS can also be applied to identify the key actors in a network of relationships within a project or programme. It allows the drawing up of plans of action that can be incorporated into practical work.

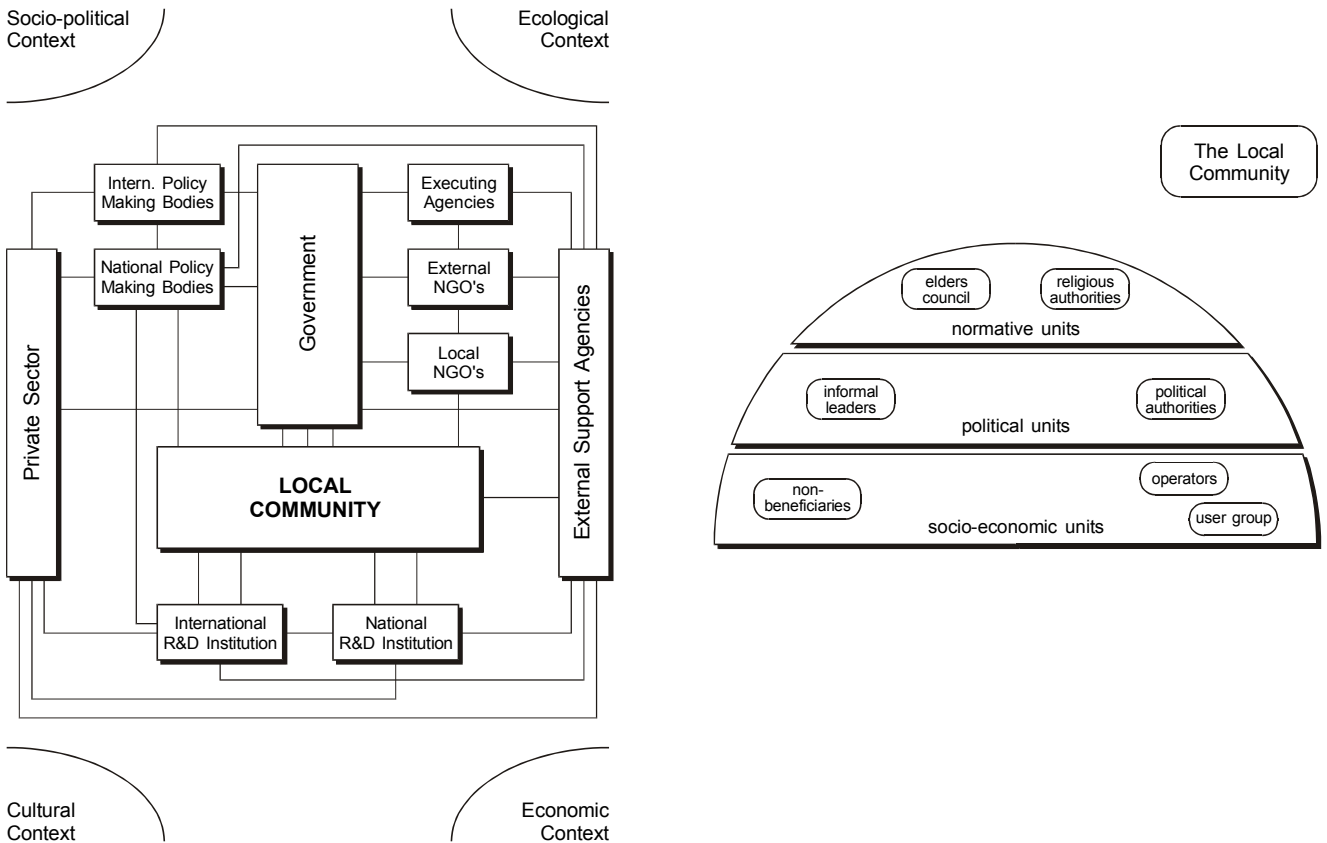


Figure 29: *The water and sanitation knowledge system, WSKS* [29] (Form Appendix M. 10)

## 2.2 Elaboration and use of the WSKS

### Stakeholders

In a first step *the stakeholders are identified and classified according to main categories*, e.g.:

- **normative units:** elders' council, religious authorities, informal leaders
- **political units:** political authorities, government representatives
- **socio-economic units:** user groups, operators, non-beneficiaries

The identified stakeholders are assigned to spatial levels (local, regional, national, international). The elaboration of actor lists and partner profiles is treated under B.1.3 Table 1 and Figure 13).

### Positions, roles

In a second step the *stakeholders, their specific positions, hierarchies and roles are defined together with their influence on project activities:*

- influence on external conditions: political, cultural, economic and ecological conditions and decisions
- influence on communal decisions and activities
- influence on personal sphere of activities and behaviour.

**Interacting processes**

In a third step, attention is focussed on the **relationships between the various stakeholders** and the links with activities.

Arrows or channels indicating the forms and/or the directions of the relations can be marked on the diagram:

- Flow of technical, institutional, organisational know-how (modern and traditional) between the international, the national and the local levels
- Flow of knowledge and information within the user community
- Teaching/learning and training processes
- Flow of money and holding of money
- Other processes and links

The outline form of the WSKS (Figure 29) can be copied onto a poster. All the participants or groups fill in the specific positions and roles. The statements are then discussed, preferably with the assistance of a neutral facilitator.

In Figure 14 a practical application for a rural water supply programme in Lesotho is presented.

### 3. PLANNING TOOLS

---

#### 3.1 Introduction

---

**Purpose and scope of planning**

**Planning tools serve to develop and define ways and solutions in order to meet defined goals and objectives within a project set-up.** Planning does not solve problems but it helps to adopt a systematic approach to them and to develop strategies for solving them.

An activity ends in chaos if it takes place without direction and goals, without a vision, without decisions and decisiveness, without responsibility, determination and discipline. Activities must be planned. Whatever takes shape in the early phase of a planning process, as a common project vision is fundamental for a later assessment of sustainability. Planning targets must therefore be defined from a long-term perspective.

**Planning is the formal centrepiece and basis for decision-making on the part of project holders and donors, and the basis for contracts of co-operation.** At the same time, it is

- the documented basis for the implementation, monitoring and steering of a project.
- a document of reference for training and institution building as well as for early co-ordination with other projects.

The choice and the use of planning aids are tasks that should be agreed on by all partners. **Good planning instruments combine both the logical and rational dimensions with the emotional and psychological.** Orientation, experience and available knowledge are embedded in peoples' subconscious (unknown forces). Planning has a rhythm between the concentration on outside factors and the attention to inner realities, between some moments of emphasising the aims, and others emphasising the process; between reality and utopia, implementation and reconsideration.



**Planning horizons**

The planning of development co-operation should be based on planning in phases and on operational planning. (Figure 30). These types of planning are closely linked to each other. They are also incorporated into national sector planning as well as in the donor's programmes. Project plans are co-ordinated with the development plans of the respective regions.

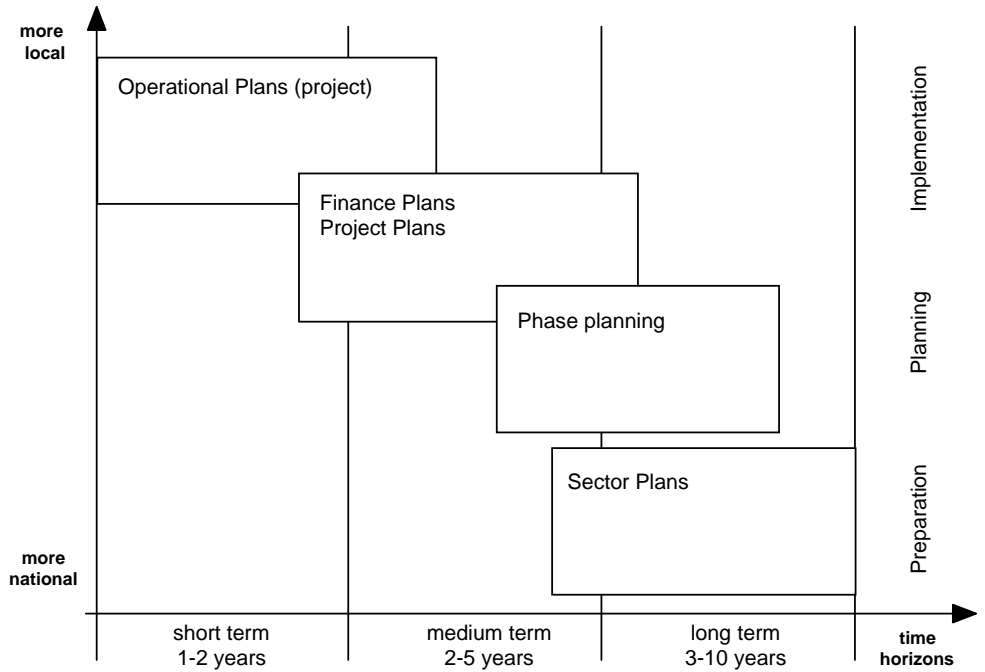


Figure 30: Planning horizons

**Key dimensions for holistic planning**

Good, holistic planning depends on the consideration of four key dimensions, surrounded by spheres of subjective reflection and 'unknown forces' (Figure 31).

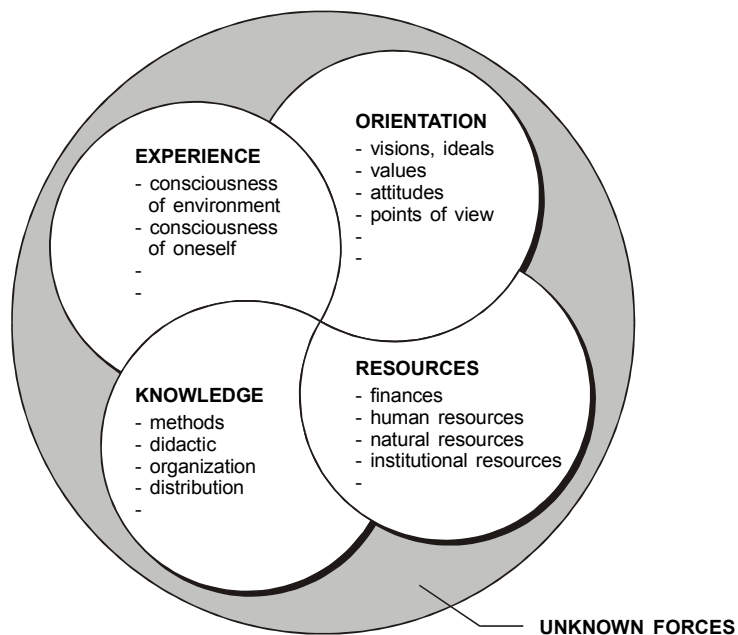


Figure 31: The four key dimensions of holistic planning

*The project should be developed through a logical and iterative process where visions are transformed step-by-step into concrete project activities* (Section 3.3). Table 18 is an overview of planning tools used in the different steps of a project. Monitoring and evaluation (of efficiency, effectiveness and impact) is the basis for successful implementation.

LEVEL	OBJECTS	TOOLS GUIDELINES	PARTICIPANTS
General planning	Development policies	<ul style="list-style-type: none"> <li>– Statutory decree</li> <li>– Donors committee</li> <li>– Conferences</li> <li>– Multilateral commitments</li> </ul>	<ul style="list-style-type: none"> <li>– National councils, parliaments, ministries</li> <li>– Bilateral donors</li> <li>– International organizations</li> </ul>
	Institutional planning	<ul style="list-style-type: none"> <li>– Guiding image, general comprehensive policies</li> </ul>	<ul style="list-style-type: none"> <li>– National departments</li> <li>– Possibly other authorities</li> </ul>
	Operational framework planning	<ul style="list-style-type: none"> <li>– National announcements, special committees</li> </ul>	<ul style="list-style-type: none"> <li>– Implementing agencies, private organizations</li> <li>– Other authorities</li> </ul>
Specific planning	Organizational development	<ul style="list-style-type: none"> <li>– Working groups training / further training concepts; information policy</li> </ul>	<ul style="list-style-type: none"> <li>– Advisor, consultants</li> <li>– Implementing agencies; NGOs,</li> </ul>
	Country planning	<ul style="list-style-type: none"> <li>– Country programmes</li> </ul>	<ul style="list-style-type: none"> <li>– Implementing agencies; consultants</li> </ul>
	Sector planning (see 3.2)	<ul style="list-style-type: none"> <li>– Sector guidelines; sector policies / sector programmes; cross-section analysis</li> </ul>	<ul style="list-style-type: none"> <li>– Sector services; consultants; sections / services; implementing agencies</li> </ul>
Specific strategies	Section planning	<ul style="list-style-type: none"> <li>– Midterm planning; strategies and principles</li> </ul>	<ul style="list-style-type: none"> <li>– Sections and services of national GOs and NGOs</li> <li>– Private sector</li> </ul>
Planning of measures, projects and programmes	Operational planning of sections and services	<ul style="list-style-type: none"> <li>– Annual programmes (sectors / countries); continuous planning; personnel planning; self-evaluation</li> </ul>	<ul style="list-style-type: none"> <li>– Sections and services; consultants (NGOs and private sector)</li> </ul>
Concrete, local programmes / projects	Phase planning of projects and programmes (2 – 5 years) (see 3.5)	<ul style="list-style-type: none"> <li>– Project / programme committee (credit proposals and requests; appraisals; studies; workshops, etc)</li> </ul>	<ul style="list-style-type: none"> <li>– Programme officers; coordination officer; implementing agencies; consultants</li> <li>– Partner governments; partner organizations</li> </ul>
	Operational planning of projects / programmes (1 year) (see 3.6)	<ul style="list-style-type: none"> <li>– Various instruments (in particular annual plans; budget and personnel planning)</li> </ul>	<ul style="list-style-type: none"> <li>– Partner organizations; users; project personnel; programme officers; coordination offices, implement. agencies</li> </ul>

Table 18:

*The variety of planning tools / guidelines* (Form Appendix M. 12)

**Principles of planning****Good planning**

- needs to be integrated, interdisciplinary, inter-sectoral and harmonised inter-institutionally, corresponding to a long-term development strategy
- is based on relevant experience and insights of the planners and of their local partners, and on a comprehensive problem analysis
- should be done with the full participation of the local project holders (extensive discussion with users, cultural and social adaptability of method), promoting self-reliance and independence
- links and shows the steps from the project vision to the problem analysis, to the evaluation of alternatives, through design and implementation to operation and maintenance (basis for later monitoring and evaluation)
- formulates qualitative and quantitative targets, allowing the monitoring of effectiveness and efficiency
- points out relevant assumptions, uncertainties, risks
- permits flexibility (rolling planning; development as a dynamic phenomenon)

**The following principles (conclusions)**, which are the result of SDC's analysis of planning activities, may help in deciding on the appropriate methods of planning. (Refer to 'Cooperation Planning' [31].)

- ❶ **Planning is a ritual** and needs a suitable structure (approaching and finding each other, finding 'the solution').
- ❷ Essential planning requires **dialogue and transparency** (between all partners concerned).
- ❸ That which is 'unsaid' and **also what cannot be expressed finds its way into planning**.
- ❹ **Planning entails restriction, restraint and compromise** (project will be less than what I and my partner hoped).
- ❺ Consider **conflict as a source of energy** (allow conflicts - they lead to new, better solutions).
- ❻ **Planning needs a shared logical methodology** (at least a common language, common thought patterns, and accepted logical planning methodology).
- ❼ **A plan is valid for a certain limited period - but not forever.**
- ❽ Planning remains relevant only with a **variety of methods**.
- ❾ **Planning needs a rhythm.**

**Practical hints**

- Have clear visions and orientations and only then begin to plan details step by step. **Divide plans into manageable sections** and/or phases.
- **Lines of authority and task assignments** should be arranged at the beginning. The stakeholders should become sensitised to the lines of authority and task allocation (transparency). The overall responsibility for planning remains with the implementing body. A modest plan developed by those involved is preferable to a huge specialist job. Use planning specialists only as support.
- **Encourage contradictions even if they are painful.** Don't ignore resistance and disagreement.
- Examine attractive, easily accessible information particularly critically.
- **Do not consider only 'validated' knowledge.** People with their partially inadequate and contradictory perception and perspectives are often the heart of planning. Avoid overburdening; **concentrate on participants' problems and expectations.** Link up with the familiar. Confine yourself to a few important components.

- Take time and energy to clarify values and develop opinions and procedures together. ***Listen and create a climate in which objections can be discussed.*** Take resistance and contradiction seriously and react fairly to it. Emphasise common ground rather than differences.
- Planning tools should be of use for constructive management of conflicts and obstacles (avoiding, solving, changing to the positive, bypassing problems).
- ***Plan time realistically.*** Announce planning steps well in advance. Arrange stress-free periods for important planning decisions; try and find the equilibrium between pressure and relaxation. Interrupt the problem-solving process with other activities.
- Point out the limitations of assessing the foreseeable. Foster a willingness to make decisions in a climate of relative uncertainty (less information and data - more discussions, workshops).
- Analyse basic assumptions regularly and review the plan in terms of reality and feasibility. ***Make flexibility a main characteristic of the plan. Declare 'learning from mistakes' as a common motto.*** When dealing with a new challenge, always go back to the starting point.

### 3.2 Sector Planning

---

#### *Purpose, content*

***Sector planning defines a long-term view*** over, say, five to ten years. It relates to a certain sector like water, sanitation, health, etc. It should be the government which sets the targets, in dialogue with the sector's actors on all levels. The sector plan considers all the fields of balanced development such as:

- ***Political:*** Desired coverage within five to ten years, regional priorities, service standards, ownership, etc.
- ***Economic:*** Finances for investment, operation, maintenance and rehabilitation of schemes, distribution of costs
- ***Institutional:*** stakeholders and their roles (community, private sector, government, etc.)

Sector plans must ensure and show inter-sectoral links (drinking water, sanitation, health, irrigation, etc.). HRD and ID are important elements of sector plans.

#### *Process*

***Sector plans follow the same pattern as a project cycle*** (Figure 32):

***Existing situation → visions → reality check*** regarding finances and natural resources etc.

#### *Practical example*

Table 19 shows planning results from the Village Water Supply Sector in Cameroon.

The ten steps towards a sector plan / sector organization / HRD / ID concept		
No.	Step	Status of progress
1	Identification of areas to be investigated	Focus on rural water supply projects in the North West Province
2	Assessment of present status through desk and additional field studies	Indicators and questionnaires for additional field studies developed; field studies ongoing, further procedure and time-schedule designed
3	Analysis and evaluation of findings	Topics to be identified and evaluated; tables partly developed
4	Development of sector plans including vision, objectives, strategies and guiding principles (upon development of coverage scenario also including outputs, activities and means)	Participatory development of 2 <sup>nd</sup> draft of sector plan during working sessions; future procedure and time-schedule designed
5	Sector organization (roles and responsibilities)	Present sector organization assessed, possible future organization discussed and designed ⇒ community based management
6	Development of various coverage scenarios	Process discussed in detail, recorded in guidelines; time-schedule agreed
7	Negotiation with Government of Cameroon, donors, executing bodies, etc.	Preliminary discussion on negotiation strategy (e.g. start with lobbying at provincial level, involve experienced resource persons)
8	Decision on practicable scenario	Expected by ..... (date)
9	a) Identification of obvious needs	Discussed and named in report above; some specific inputs already made (pilot projects)
	b) Assessment of additional needs	Included in questionnaire
	b) Finalisation of concept	To be based on agreed sector plan
10	Implementation of modified sector plan	Content developed from the old plan

Table 19:

*Sector plan / organisation / HRD + ID concept – an example of a village water supply programme, Cameroon*

### 3.3 Project planning steps, conditions and tools

A planning procedure is not an orderly, homogenous process; in practice, planning often proceeds in tandem with implementation: various stages overlap and assessments of past steps are going on at the same time as preparations for the next step. The process cycle can repeat itself and thus become more and more defined (Section 3.4).

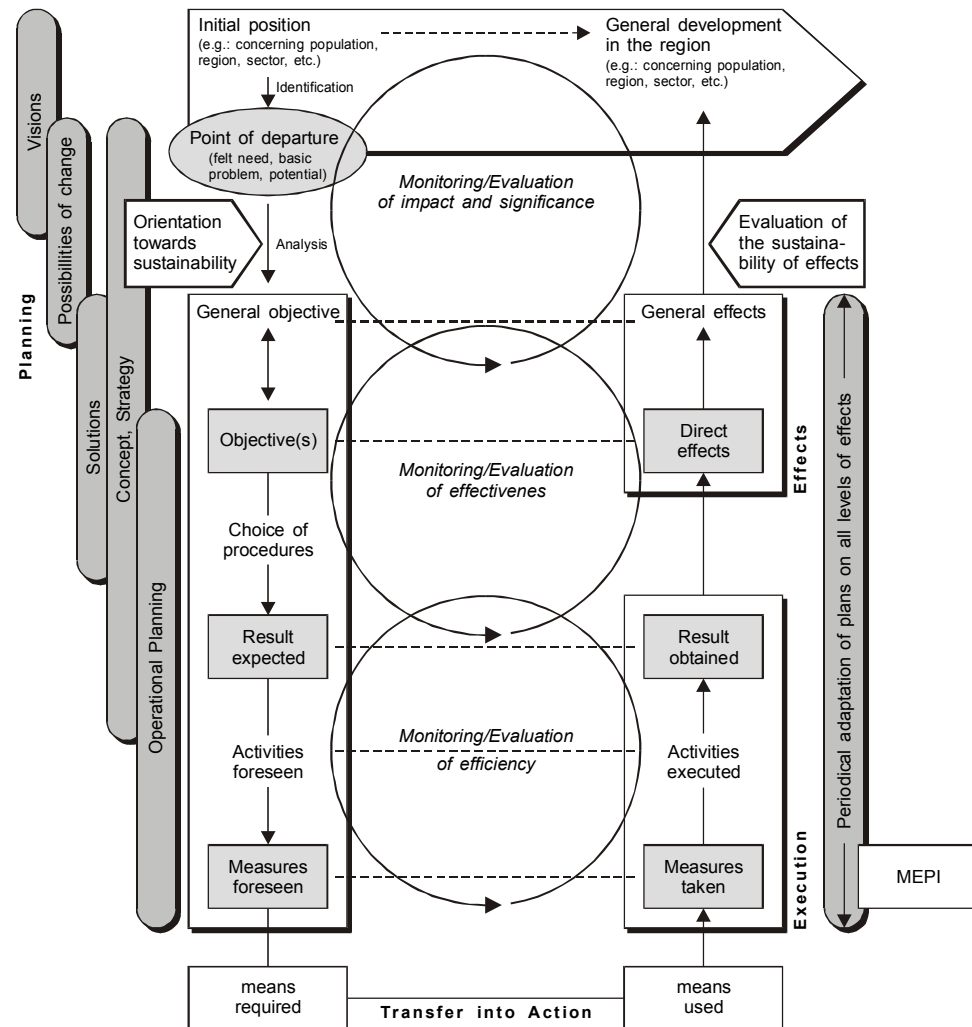


Figure 32: Planning steps in the project cycle (diagram by SDC)

The six steps mentioned in Table 20 correspond to the monitoring and evaluation diagram (Figure 32).

Step	Conditions	Tools to structure procedures or to facilitate planning processes (see Appendix F and G)
1. <u>Vision(s), preparation of planning</u>  What does exist?  What do we (not) want?  What do we need?  Environmental conditions (resources, impact)	Awareness, concern, intuition, pleasure in experimenting, preparedness to dialogue, change and challenge	Participatory appraisal elements (PRA), SWPO, sketches, drawings, mind-mapping, notes, letters, tape recordings, qualitative assessments, action research
2. <u>Possibilities of changes</u>  Ideas ripen, are discussed; prioritisation of ideas; exchange with external advisors	Creativity, fantasy, imagination, models	Brainstorming forms, creative process facilitation analogies, role playing, visits, future workshops (utopia phase), scenario writing; <u>GOPP steps</u> , PRA elements, action research, anecdotes, stories, photographs, invitations.
3. <u>Options</u>  Evaluation of alternatives in view of: - institutional capacity (O+M, WTP) - short- and long-term effects, - costs, - duties and benefits for users and for others, - outside support, - mutual decisions	Sense of reality and ownership, community spirit, skill in negotiating	Assessments, action research, <u>GOPP steps</u> , benefit analysis, morphology, PRA elements, <u>SWPO</u> , future workshop, (phase of realisation), evaluation, environmental impact, brainstorming, role-playing, visualisation.
4. <u>Phase Planning</u> (Development of a concept and strategy on different levels):  Institutions, co-operation, internal and external relations, frame conditions, main activities, costs, competence, project documentation	Trust, assignment of long-term responsibilities to the users right at the beginning, knowledge of environment, perseverance, demand-responsiveness, local ownership	Conditions laid down by country programmes, regional development and sector plans, credit requests and proposals. <u>Project planning overall view (out of GOPP)</u> , <u>flow charts</u> , <u>SWPO</u> .  At community level: negotiation through meetings, visualisation, PRA-elements, project visits, role-playing etc.
5. <u>Operational planning</u>  Detailed design, technical documents, operation plan (mid- and short term), institution building and HRD	Sense of what is possible, feeling for human and institutional potentials, skills in transferring into action (design and implementation), a talent for organisation	<u>Project planning overall view (out of GOPP)</u> , diagram of functions, <u>bar charts</u> , budget, discussions, list of duties, role and job descriptions, diary of operations, organigram, buying plan, visualisation, <u>brainstorming</u> , permanent future workshops. (see 4.3, tools for implementation)
6. <u>Periodical adaptation of plan</u> (small MEPI-cycle)  Monitoring, evaluation and steering  Adjustment of planning	Readiness to learn, ability to criticise, imagination, ability to observe, discipline to reflect	Self-evaluation, external evaluation, open questions, key indicators, action research, regular working meetings, retreats, <u>SWPO</u> , studies, opinion polls, PRA steps, brain-storming, creative process, facilitation. Environmental impact monitoring.

Estimation of influencability and reality check according to Figure 28.

Table 20:

**A view of planning steps, conditions and respective tools (Form Appendix M. 13)**

### 3.4 The MEPI cycle

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**Orientation phases, action research or rolling planning** are some of the approaches being increasingly adopted. They stress the dynamic and, for the most part, unforeseeable character of project development and its environment.

#### Monitoring Evaluation Planning Implementation

**Monitoring, Evaluation, Planning and Implementation (MEPI)** represents the four most important phases of an ongoing and repeating programme or project cycle.

Appropriate monitoring data (developments and actual situation) and their proper analysis and evaluation are preconditions for the planning of sustainable projects and their successful implementation.

In order to achieve optimal processes and achievements, the MEPI cycle should be repeated periodically and especially at the beginning of a new project phase. Monitoring and evaluation techniques are described in [Section 5.2](#).

### 3.5 Phase planning

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**The phase plan is the medium-term master plan** for a concrete project or programme. It is developed and negotiated among the partners. The phase plan:

- is based on the relevant sector plan
- takes precedence over the implementation (operational) plan and serves as a reference document. In development co-operation, it forms the basis of the project contract and credit proposal
- provides information on all main aspects of the project such as overall and specific objectives and benefits, strategies, proposed activities, expected results, technical standards and dimensions, required resources, timetables, etc.
- assists in the identification of indicators for assessing effectiveness (M+E)
- points out relevant assumptions, risks and trends
- gives an outlook beyond the planned project phase (e.g. future upgrading of services, extensions).

### 3.6 Operational plan

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The operational plan is described under [Section 4.2](#) (implementation).



### 3.7 Water Resource Management

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#### Purpose

**Appropriate management of natural resources is one of the most important conditions for sustainability** and must be considered in any development planning. As competition grows for diminishing resources, communities and governments face difficult choices. Water diverted for agricultural or domestic use upstream may deplete or contaminate resources needed for industrial growth or to satisfy the needs of expanding populations downstream. Without guaranteed and protected supplies, community projects may be rendered worthless. Governments must ensure that water allocations are both equitable and sustainable.

**The checklists presented below** should facilitate not only the analysis and understanding of problems and the definition of the ecological capacities of nature, but also the fair allocation and sustainable, efficient use of limited natural resources. Water should not be viewed in isolation. The exploitation of nature as a whole should be considered (land and soil, plant cover, wildlife, construction material, firewood, etc.). The interdependencies need to be evaluated. An adequate environmental impact assessment (Section 3.8) is the basis for sustainable water resource management.

#### Ecological objectives for planning (see also A 2.2)

- The entire, multi-sectoral **development strategy and planning of a region should consider ecological implications** (limits to growth)
- Efficient, sustainable and fair **management and allocation of water resources**
- **Management, monitoring and evaluation of natural resources and degradation as a whole** (development yesterday - today - tomorrow!)
- **Ecological strategies** in farming, herding, forestry, etc. should not be limited to intake areas only. Protective working methods should become the normal working style in entire watersheds and basins
- **Ensure that ecological measures are economically attractive and viable;** apply initial incentives if necessary
- Definition and **minimising of direct and indirect negative secondary effects for nature**, for users and neighbours up- and downstream
- **Learning from positive and negative experiences** here and elsewhere (drought, floods, erosion, plant cover protection, etc.), co-ordination and networking among ecological institutions and programmes
- The implementation and enforcement of **suitable laws and regulations** can help considerably in achieving environmental sustainability

#### Key tasks and duties

- **Assessment of ecological situation** and natural potential in a project region (yesterday - today - tomorrow).
- **Water balancing** (short and long-term, dry periods, rainy seasons, etc.). A rough calculation can often indicate clearly whether a desired project is realistic or not. A simple, often neglected, rule of thumb is: it is impossible to use more water than nature provides.
- **Definition of the 'relevant environment'** (sphere of positive and negative influences)
- **Evaluation of various project alternatives** with regard to direct and indirect ecological implications (eco-balancing)
- Implementation of **environmental monitoring** and steering of projects, supporting measures
- Definition of **priorities and management rules for drought periods**

**Practical hints**

- Changes over time (trends from the past to the future) are often underestimated.
- Churches and religious groups could sometimes do more in ecology (preservation of creation).
- Folk memory covers a period of only 5 to 10 years
- Where water is just one of several factors limiting the standard of living, it would probably not be wise (and it could even be counter-productive) to concentrate available resources on the development of water services only.
- Inter-generational dialogue can facilitate the understanding of ecological problems.

### **3.8 Environmental impact assessment (EIA)**

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**Purpose**

The environmental impact assessment method enables early recognition of the potential effects of various alternative courses of action on the natural environment (soil, water, air, flora and fauna) in a given geographical, political, economic and social context. In this way, the overall planning of a project can be influenced in an environmentally sound way.

At present there are various environmental impact assessment aids in use: guidelines and related check lists, manuals, environmental studies, investigation procedures, indicator systems and working aids. These usually extend over the three procedural stages of

- environmental screening
- initial environmental evaluation and
- environmental impact assessment

In the first stage environmentally sensitive projects are distinguished from environmentally neutral projects, in the second and third stages the expected environmental effects are examined either in general or in depth, depending on their importance.

**How can the parameters and the area of consideration be defined?**

**What are the geographical and thematic spheres of environmental considerations?** This depends very much on the size of a project (absolutely and in relation to the natural capacities of the region concerned). Table 21 shows a list of environmental fields which could be relevant to particular projects at certain stages. This matrix showing causes and effects can serve as a checklist for assessments as well as for effect monitoring.

**Some examples of general plausibility considerations:**

- In water projects where more than 10 - 20% of the dry-season water flow of a river is captured, the whole upstream river basin has to be considered as a sphere of influence. Where the water diversion is less, a reduction of the area considered could be justified. Potential downstream consumer areas need to be considered until the river joins another one with a similar or higher flow.
- The water conditions at the intake (quality, quantity) are factors that are important in defining the area of environmental consideration and measures: where water is scarce and of inferior quality the area of protection and rehabilitation measures must be enlarged.

- Downstream of a village's or a town's wastewater discharge, river pollution could be critical for a certain distance depending on a number of conditions. This critical distance could be less than 500 - 1'000m, if the following 3 factors apply:
  - the waste water is not more than 20% of the river flow
  - there is reasonable turbulence in the river
  - waste water is treated in soak aways (i.e., solid parts removed) and infiltrated over at least five meters before being discharged into the open river

Project:..... (No. .......) Date: .....

- Environment - Exploitation - Use		Environment															Exploitation, use							Human fields							Remarks								
		Physical-geographical aspects (quantitative)												Biological-chemical asp. (qualitative)																									
- Project - Measures		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
		Groundwater	Surface water	Evaporation	Run-off regime	Draft periods	Groundwater fluctuation	Soil	Flora	Fauna	Erosion	Sedimentation	Pollution (faecal, salination, etc.)	Warming / eutrophication	Pollution by agriculture	Water supply	Irrigation	Agriculture	Animal husbandary	Forestry	Fishery	Small industry	Energy	Loss of land	Tourism	Legal aspect	Traditional rules	Culture and religion	Land reform	Land dispos	(Re)settlement/ migration	Life standard	Health	Nutrition	Jobs labour	Legend: Effects, importance: ○ small ○ medium ○ great R Risk factor M Measures needed + positive - negative			
Starting position	20 years ago																																						
	Today (actual situation)																																						
	After 20 years, without project																																						
	After 20 years, with project																																						
Construction	Main structures																																						
	Secondary structures																																						
	Infrastructure																																						
Operation	Water supply																																						
	Irrigation																																						
	Flood protection																																						
Special event	Drought period																																						
	Flood event																																						

Table 21: Matrix of causes and effects (environmental impact assessment) (Form Appendix M. 14)

**What is the ecological capacity of a project area?**

It is difficult to define the ecological capacity of a project area by scientific methods. But there are practical ways to answer the questions, at least roughly. **Factors such as the population, animal density, soil cover, land, agriculture, water, economy, health, education and so on influence and limit each other.** In most development planning, **at least two limiting natural factors must be accepted: water and land.** The effectiveness of exploitation and the regional allocation of these two elements might still be open to external influence, but rigid limits to growth (Figure 33) exist and their definition is normally not too difficult. Within such **objective limits**, development projects in the sector of water and sanitation (and others) can be planned. At the same time negative effects (overpopulation leading to degradation and erosion) must be avoided or at least minimised.

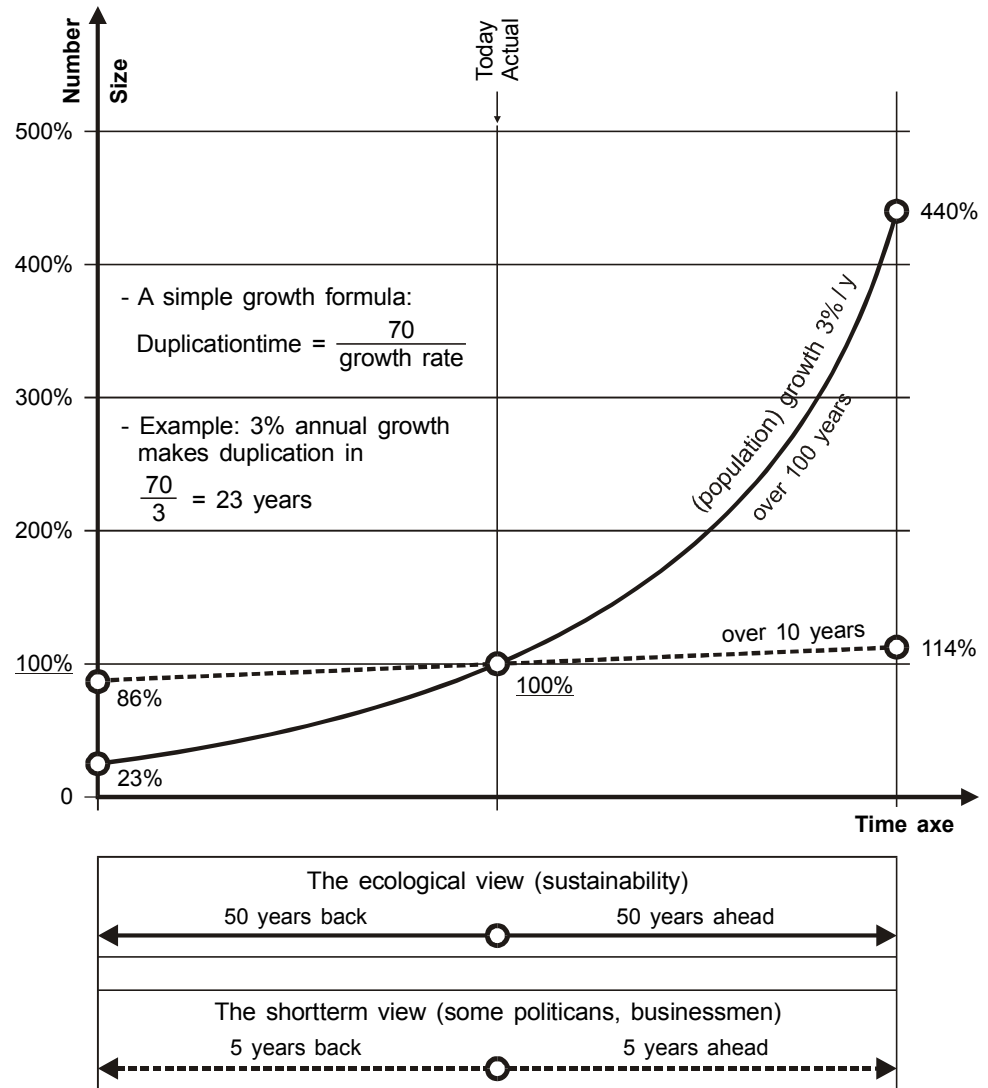


Figure 33: What growth really means

**Environmental Monitoring**

The defined spheres and factors of influence (Table 21) give the framework and parameters for environmental monitoring. **The appropriate level of monitoring needs to be defined for each specific project and indicator.** It must be emphasised again that **the monitoring programme needs to be as small and as simple as possible.**

**Planning of supportive measures**

A suitable package of measures must be worked out for each specific project. Table 22 shows an example of watershed management (package of protective measures) in a programme of rural water supply in Cameroon.

SECTOR	OBJECTIVES, RESULTS	ACTIVITIES	INDICATORS	RESPONSIBLE BODIES, RESOURCES
<b>INSTITUTION BUILDING AND HUMAN RESOURCES DEVELOPMENT</b> <ul style="list-style-type: none"> <li>Regional commit. sub-committees, representing Bambui, Bbanki farmers and Sabga graziers</li> </ul>	<ul style="list-style-type: none"> <li>Autonomous and capable watershed committees;</li> <li>Participation of all beneficiaries incl. women.</li> <li>Improved farmer's skills for land and crop management</li> </ul>	<ul style="list-style-type: none"> <li>Information</li> <li>Sensitisation</li> <li>Animation, promotion</li> <li>Training of promoters and farmers</li> </ul>	<ul style="list-style-type: none"> <li>Existence and functioning of committees</li> <li>Number and type of projects; area under control (% of total watershed area)</li> <li>Participation of beneficiaries. (% of number of farmers)</li> </ul>	HELVETAS SAP (other NGOs) WATERSHED COMMITTEES
<b>CONSERVATION OF INDIGENOUS FORESTS,</b> <ul style="list-style-type: none"> <li>All areas, especially along watercourses</li> </ul>	<ul style="list-style-type: none"> <li>Reduce deforestation and stabilize forest cover</li> <li>Conserve biodiversity</li> <li>Protect animals</li> </ul>	<ul style="list-style-type: none"> <li>Sensitisation</li> <li>Information on alternatives to forest farming</li> <li>Monitoring of forest areas</li> <li>Control of hunting and trapping</li> </ul>	<ul style="list-style-type: none"> <li>Area monitored and under control (% of total forest area, % of farmers sensitised and practicing forest farming methods)</li> </ul>	SAP (other NGOs) WATERSHED COMMITTEES, PROMOTERS
<b>AGRO-FORESTRY PRODUCTION</b> <ul style="list-style-type: none"> <li>To replace seasonal shifting cultivation *</li> </ul>	<ul style="list-style-type: none"> <li>Introduce AF as viable alternative to slash and burn seasonal farming (hedgerows, alley cropping, live fences, fodder and manure trees)</li> </ul>	<ul style="list-style-type: none"> <li>Sensitisation</li> <li>Information</li> <li>Training</li> <li>Demonstration, Implementation on farms, plant nurseries,</li> <li>Outplanting, monitoring</li> </ul>	<ul style="list-style-type: none"> <li>Attitude of farmers towards AF practices (% of farmers who changed to AF practices, area under AF land use), number of trees planted</li> </ul>	SAP (other NGOs) WATERSHED COMMITTEES, PROMOTERS, FARMERS
<b>SOIL &amp; WATER CONSERVATION</b> <ul style="list-style-type: none"> <li>On agricultural and grazing land</li> </ul>	<ul style="list-style-type: none"> <li>Erosion control in water intake and agricultural areas</li> </ul>	<ul style="list-style-type: none"> <li>Contour farming</li> <li>Green manuring</li> <li>Reforestation and grass planting for soil stabilization and protection belts</li> </ul>	<ul style="list-style-type: none"> <li>Attitude of farmers towards SC practices. (% of farmers who changed to SC practices), area restored</li> </ul>	SAP (other NGOs) WATERSHED COMMITTEES, PROMOTERS, FARMERS
<b>PASTURE IMPROVEMENT</b> <ul style="list-style-type: none"> <li>On Fulani grazing land **</li> </ul>	<ul style="list-style-type: none"> <li>Increased fodder production</li> <li>Night paddocks</li> <li>Controlled grazing</li> </ul>	<ul style="list-style-type: none"> <li>Establishment of pasture plots</li> <li>Inputs for protection and maintenance</li> </ul>	<ul style="list-style-type: none"> <li>Area established, % of graziers involved in pasture improvement</li> <li>Level of inputs</li> </ul>	SAP (other NGOs) GRAZIERS
<b>WOODLOTS</b> <ul style="list-style-type: none"> <li>Away from water courses</li> </ul>	<ul style="list-style-type: none"> <li>Income generation</li> <li>Reduction of pressure on indigenous trees</li> </ul>	<ul style="list-style-type: none"> <li>Selection of plots; suitable and establishment of woodlots</li> <li>Monitoring</li> </ul>	<ul style="list-style-type: none"> <li>Motivation</li> <li>Interest, labour input for establishment and maintenance</li> </ul>	SAP (other NGOs) WATERSHED COMMITTEES, PROMOTERS
<b>APPROPRIATE LAND USE AND SPATIAL ARRANGEMENT</b>	<ul style="list-style-type: none"> <li>Regulated land tenure and security</li> <li>Separation of grazing from farm land by creating buffer zones</li> </ul>	<ul style="list-style-type: none"> <li>Sensitisation</li> <li>Land allocation and demarcation</li> <li>Issuing land bonds</li> <li>Establishment of live fences and protection belts</li> </ul>	<ul style="list-style-type: none"> <li>Number of applications for land bonds distributed</li> <li>Fences and other permanent structures established</li> </ul>	TRADITIONAL COUNCILS, WATERSHED COMMITTEES, PROMOTERS

\* Hardwood, soil improving species, fruit trees, medical plants

\*\* Kikuyu, Bracharia, Guatemala grass, fodder legumes

Table 22:

*Watershed management - supportive measures for a rural water supply programme in Cameroon (Form Appendix M. 15)*

## 4. TOOLS FOR IMPLEMENTATION

### 4.1 Introduction

#### Purpose - Scope

**Implementation means the realisation of plans, the achievement of the defined objectives of a project.** Implementation follows a defined strategy, including periodical checks and adjustments.

Implementation tools must consider the local situation and needs and should promote efficiency and effectiveness. Implementation tools cannot be created only theoretically. After their development they need to be tested and adjusted under working conditions.

#### Main tasks

**The main tasks of management tools for implementation are:**

- to organise, to direct and control processes on the basis of designed plans, working towards the formulated goals (economy, ecology, sociology)
- to apply the defined and approved strategy and policy
- to decide within the competence framework and to allocate competencies and responsibilities
- periodically to monitor and evaluate progress and the appropriateness of effects and strategies, and to adjust them accordingly
- to make processes understandable and understood by all people concerned
- to make the best use of human potential and any resources

Tools for implementation must be compatible with or applicable by community management (A 2.3). For the elements of organisation and management see B 4.3. Figure 34 shows the main management tasks (Figure 22).

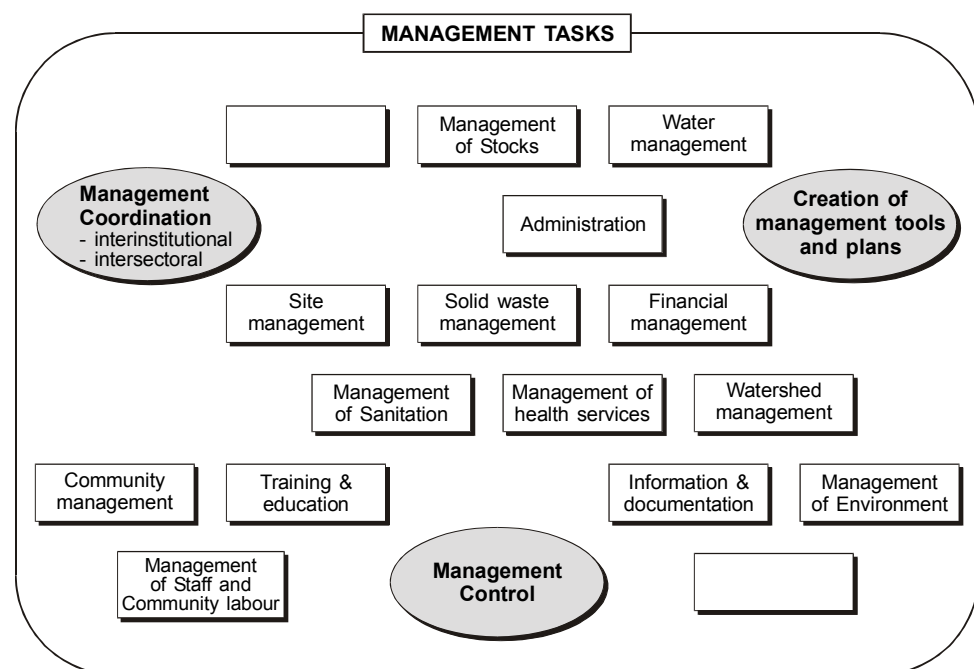


Figure 34:

*Management tasks for project implementation*

## 4.2 The operational plan

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### Scope and purpose

The operational plan is *the most important implementation tool* in a project or programme. It is the integrating component of the overall planning concept. Usually it is *a one-year operational interpretation of the phase plan* (B 4. and Appendix G.1).

#### *The operational plan:*

- is a document which is compiled jointly by all the participants. It acts as the guideline and reference for project activities for one year
- informs, documents and sensitises (applies to outsiders as well)
- provides the basis for a conscious examination of activities and procedures (monitoring, self-evaluation, decision making) as well as for any change in direction which may be needed
- is considered as part of a chain of operational plans

#### *It contains or defines:*

- realistic objectives and targets (time, quantities, quality) and measures to achieve them
- how and with whom the partners shall co-operate, who takes on which tasks
- information about financial resources
- stages of work

### Elaboration and use

Figure 32 shows operational planning as the last and most concrete element in a chain of planning events. The operational plan is based on previously developed visions, on needs assessments and environmental considerations, on evaluated alternatives, concepts and strategies. *The operational plan must correspond to the defined objectives.*

In major projects running over several phases or years successive operational plans are required. A new plan should consider the lessons learnt from the implementation of previous plans (M+E results).

While preparing a new operational plan, the following questions should be answered:

- Who drew up and used operational plans in the past? For what purpose? How often? What implications does this have for the future?
- Has the operational plan enabled the executors to proceed according to the plan effectively and efficiently?
- Has the operational plan facilitated co-ordination, decision-making and team-work?
- Is there room in the operational plan for reflection?

### Possible structure and contents

The guidelines for content and structure as described here are suggestions and should not be regarded as compulsory. It is more important to interpret and apply them creatively.

#### *1. Where do we stand today?*

Comments on the now-ending operational plan, on the basis of a review and evaluation, should contain a critical situational assessment and a review of past experiences:

- the most important findings so far

- relevant experiences (events, results) in the previous year (successes, problems/tedious aspects, lessons learnt)
- relevant events in the environment of the programme.

## 2. *Where do we want to go?*

The new operational plan for the year Y:

- Direction, objectives, uncertainties, general important comments
- Activities and anticipated results including hints on **key events** and time demands
- Project organisation (organisational structure, internal organigram, important procedures such as decision-making, periodical events such as meetings, etc., division of labour, responsibilities)
- Human resources/major demands on implementation personnel (staff requirements, internal and external training, and consultants)
- Financial resources: operational budget (chart of accounts, sources, financing)
- Monitoring, evaluation, reporting (meetings, workshops, reports, self- and external evaluations, definition of indicators etc.)

Figure 21 is a form which allows the structuring and visualisation of the elements of an operational plan. The specific implementation tools that are mentioned under [Section 4.3](#) are often part of operational planning.

### *Practical hints*

A process of ***self-evaluation can be a suitable entry point*** to operational planning.

Not all the constraints can be eliminated or avoided through careful operational planning. It's a challenge for agencies and communities to be prepared to deal with the unexpected and to adjust plans accordingly. Building in flexibility helps to offset problems such as budgetary pressures, staff movements, political changes, etc.

#### ***There is a risk that operational plans:***

- are not adequately linked to the phase plan which defines the orientation of the operational plan
- are neither dynamic nor self-critical in describing the planning process
- do not identify and face up to bureaucratic and technocratic problems
- do not mention uncertainties or the presumed precision of qualitative objectives
- are not adequately linked to the monitoring, evaluation and continuous reappraisal of meaningful key indicators

## 4.3 *Specific implementation tools*

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Goal oriented project planning (GOPP)	– <a href="#">Appendix F. 3</a>
Task charts	– <a href="#">Appendix G. 3</a>
Bar charts	– <a href="#">Appendix G. 4</a>
Flow charts	– <a href="#">Appendix G. 5</a>



## 4.4 Management of personnel

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### **Purpose and scope**

Good personnel management (including management of voluntary staff) and proper administration are essential for every project. Personnel policies must be transparent and clear, and should also correspond to the relevant sector policy. In particular, employment beyond voluntary community labour needs to be in accordance with government labour regulations.

**Leadership of personnel involves the promotion of individual and collective motivation.**

The management of personnel includes:

- Staff recruitment
- Contracts, job descriptions
- Salary/remuneration and incentives system (affordable, fair)
- Human resource development (Section 6) including career promotion
- Exchange of experience
- Disciplinary and grievance procedures

Some practical elements of personnel management are described under [B 4.3](#).

### **Recruitment**

**Staff recruitment must be transparent and accessible to all prospective candidates.** Such processes need adequate planning and sufficient time. Posts and the required qualifications should be clearly defined. The evaluation and selection of candidates should involve the entire management or leading body (in face to face meetings). For institutional function holders such as committee members the process is different: they are usually nominated and elected by the community in a democratic procedure according to common or project regulations.

### **Job description**

**Job descriptions are essential for all staff and also for function holders** (e.g. committee members, etc.). Main duties and responsibilities should be written in clear language. Job descriptions need to be revised from time to time (Table 14).

### **Representation or replacement in case of absence**

The performance of a project depends mainly on the presence of qualified and motivated staff, workers and committee members. Still, each person can drop out for short or longer periods. Therefore it is necessary that **each person has a designated representative** who is well informed and able to overtake his/her duties and functions at any time. Similar emergency provisions might be appropriate for important equipment (spare parts or units).

### **Discipline**

In an environment of fair management and working conditions where people are satisfied with their job, discipline should not be a major problem. Still, it is the duty of management to monitor the work performance of staff. In minor cases of misconduct the first step is a discussion with the staff directly involved. In serious cases or after repeated misconduct, written warning shall be given before any dismissal action is taken. Action regarding staff discipline should be in accordance with local labour regulations.

**Practical hints**

For long-term employees especially, the following aspects need to be defined in accordance with local laws and regulations:

- accident insurance, social insurance and old age pension
- holiday, casual and parental leave
- contract termination etc.

## 5. DATA AND INFORMATION MANAGEMENT

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### 5.1 Information and communication

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**Purpose - Scope**

Co-ordinated, communal efforts are possible where mutual understanding exists. Such understanding grows through constructive dialogue. **Effective information is a basic condition for dialogue and mutual understanding.** Reliable, up-to-date, and accurate information is vital to policy makers and planners, trainers, technicians, project staff and users. In most countries many different institutions and government departments work in water and sanitation. National information policies for the sector can provide frameworks for developing complementary and compatible information systems which will reduce duplication of efforts and unnecessary expenditures. In this manual, however, emphasis is laid on project internal and regional information and on the dialogue between the direct stakeholders.

In several other sections information and communication are mentioned as pre-conditions:

- Appropriate information is one of the principal sustainability criteria 3.1
- Development co-operation 3.2
- Project management 4.1 – 4.3
- Monitoring, evaluation and reporting 5.2
- Institution building, training, human resources 6

Therefore, this chapter is limited to a few basic considerations of general importance. **Communication and information means exchange and sharing of knowledge among people, institutions, social groups, cultures, disciplines and sectors.**

The conveyance of information can be explained with a simple model (Figure 35). **Communication means more than information.** Information or its perception needs to be understood and interpreted. Non-verbal aspects, opinions and expectations can influence a communication process. Symbols too can have several meanings - information is multi-dimensional (Figure 36): objective and subjective content of the message, relation and appeal on both sides, etc.

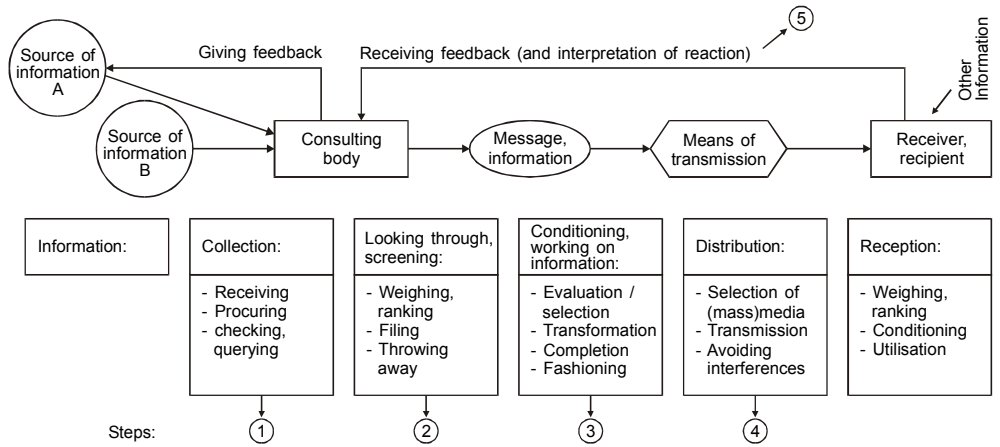


Figure 35: The transmission of information (a model of communication)

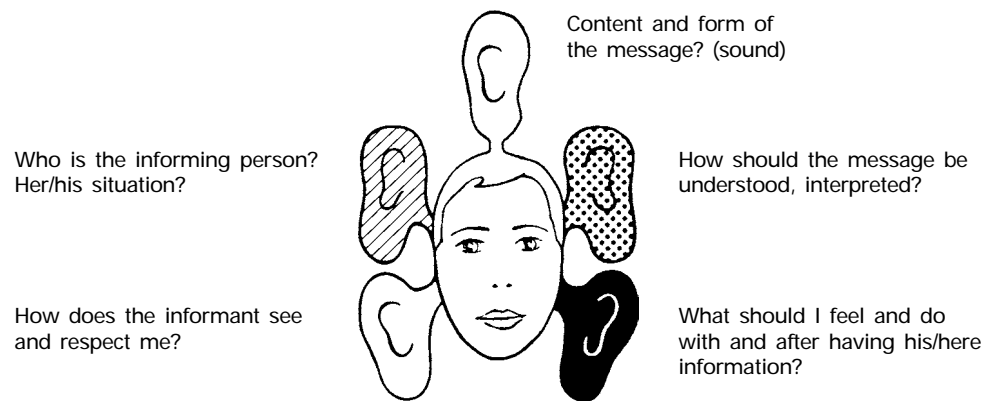


Figure 36: The dimensions of information (AGUASAN workshop 1991)

**Quality criteria for an information and communication system**

**Intelligent information systems include:**

- **the promotion of:**
  - awareness, conviction and motivation
  - increased transparency
  - sharing of and benefit from experiences
  - visualisation and understanding of situations and processes (successes and problems)
  - appropriate and timely information in terms of quantity, quality and reliability
  - compatibility with other systems (exchange)
- **the reduction of:**
  - misuse or restriction of information (use of knowledge as power)
  - conflicts, through transparent conflict management
  - wrong or inappropriate information
  - flood of information (paper war)

**Promotion of a favourable climate for communication**

Fruitful and effective information/communication grows in an appropriate climate (**culture of dialogue**). Both sides are motivated and open to dialogue, both are willing to listen and to speak. A person or an institution cannot concentrate purely on information collection; there must always be a balance between giving and receiving.

*The following considerations will help to promote a favourable climate for communication:*

- **Confidence and respect, openness, reliability of partners**, friendly atmosphere, clear language
- Barriers hindering dialogue should be removed
- **Dialogue at the right time** (no stress; consideration of daily and seasonal programmes, culture and traditions)
- Training of interviewers and other staff in communication (technical and social skills, sensitivity to reality, motivation)
- The information policy must be defined, formulated, co-ordinated and financed, the responsibilities clarified
- **Each project requires an information concept**
- Application of **appropriate media** (Table 23)

### **Communication through meetings**

Meetings (staff, committees, community, etc.) are excellent tools for information and communication. Meetings need preparation, structure and guidance. **A few points which can make meetings more efficient and successful:**

- regular meetings, not too often, not too seldom
- invitation (who should participate? do not be restrictive with invitation)
- agenda, distributed in advance (participants can prepare topics); It is advisable to use standard agendas and to make reference to the previous meeting's minutes.
- suitable place, with the necessary infrastructure and equipment
- clear structure and leadership / start and end on time / discipline
- open, friendly atmosphere, democracy, respect
- short, clear statements, precise conclusions and decisions (allocation of responsibilities and duties, etc.)
- visualisation of processes, conclusions and decisions
- short, well-structured minutes distributed within a few days to participants and others as required

### **Information media**

Information, meaning the transmission of messages, depends on media. What are the adequate, available, necessary and affordable instruments to distribute information? (Table 23). How do people select and use these instruments? **What means are suitable for reaching the target groups?**

- 
- Mass media, partly in local language (radio, newspapers, periodicals, specialist journals, letters, appeals)
  - Books, libraries, posters, exhibitions, documentation and information centres,
  - Workshops, courses, conferences (with role plays, theatre),
  - Competitions between projects or villages
  - Team colleagues, sector colleagues, professional groups, advisers, facilitators,
  - Models, demonstration units, teaching material, slides, photos, films, videos.
- 

**Table 23:**

### **Information media**

## 5.2 Monitoring and evaluation

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### *Purpose, scope and definitions*

**Monitoring means observation and systematic recording of processes, results, effects and impacts with reference to previously defined objectives and targets.** Objective-oriented project planning and implementation methods (B 3) are a pre-condition for meaningful monitoring. Correct evaluation, planning, implementation and steering of processes (Figure 32) depend on monitoring. Often project collaborators may think that monitoring is not really necessary because everyone knows what is happening anyway. In practice the pressures of daily routine often obscure a more long-term and inter-sectoral view. Project staff and leaders may fail to perceive and monitor the effects and impact of a project.

**Evaluation means a periodic critical review** of the development and operation of a project based on monitored data. The conformity with or the discrepancy from project goals and overall conclusions can be drawn, and recommendations made. An evaluation does not replace, but facilitates, decision-making. The findings will be of interest also to other ongoing projects, and will contribute to the planning of new ones.

**Monitoring and evaluation are inseparable management tools** which must be considered in the context of B 4.3 (management, organisation). Appropriate monitoring and evaluation enables the stakeholders to learn from their own and other experience and to maintain a programme in accordance with the objectives. In most cases monitoring, reporting and evaluation are not external activities done by and for outsiders. On the contrary, monitoring and evaluation should be part of the project, based as much as possible on self-reliance and participation.

M+E allow communities to compare their achievements with others, and may reveal changes that require action by the water committees, caretakers or water users. At certain stages of the project (milestones, particular problems) an external evaluation may be required by donors and/or by local project holders. It should bring in a constructive but critical view from independent outsiders. A small team should be selected especially for this task, with professional, sometimes expatriate, and local members. Mutual agreement by all parties on the terms of reference and on the composition of the team is an essential condition. Frequent interaction with the project team is a must. If external evaluations are foreseen, the relevant intentions should be mentioned in the earliest project agreements. Donor organisations may also do sectoral evaluations over a greater number of projects to develop their own policies.

**M+E is not limited to a particular project phase. It starts with planning and goes on after construction through the entire operation and maintenance phase.** For particular items and parameters it might even be necessary to look far back and to investigate how a certain development occurred (problem analysis). M+E concerns not only the efficiency (optimal use of resources) and the effectiveness (output, project effects) but also the impact in terms of economy, health, social standards, ecology, etc. It is important to observe and to report on quantifiable achievements and financial aspects. However, monitoring should also include reference to procedures and other intangible dimensions.

Processes and progress need to be monitored following a methodology which ensures the gathering of the correct data and information, so that adaptation of planning and management is possible (Section 3.4). **The information obtained and the evaluation findings are raw material to be integrated into activity planning.** Apart from this, information also has a significant promotional value as public information for users and for global management and co-ordination. M+E is a style of working which facilitates not only the identification of successes and failures but also the perception of trends before deviations from what was originally envisaged are too great.

## Key objectives for M+E

- **M+E should not be limited to the objective, quantifiable indicators.** Intangibles such as emotions should be observed, recorded and taken into consideration also.
- **Creation of a simple system of information collection and reporting**, of analysis and steering at the very beginning of a project (preparation phase)
- **The periods of investigation and the intervals of observation must be defined for different parameters.** Fast changing factors must be observed more frequently than others. Ecological factors such as climatic changes or the degradation of a vegetative cover need to be monitored over long periods (generations, 30, 50, 70 years back).
- Proper planning and design and clear definition of processes, goals and objectives on the three levels (Figure 32):
  - efficiency (input / output)
  - effectiveness (effects)
  - impact.
- Traditional structures or elements of M+E should serve as a basis for an improved system, well integrated in the socio-economic framework.
- **Assurance of conformity of activities with project objectives (efficiency and effectiveness)**
- Optimal planning and steering of processes (Figure 26); **learning from positive and negative experiences** (feedback); to reduce the magnitude of the trial and error process; recognition of needs, structural or management problems when they start to develop
- **Intra- and inter-sectoral as well as inter-institutional co-operation**, co-ordination and exchange (local, regional, provincial and national level)
- Better management of transition periods and of staff changes
- **Sensitisation of stakeholders or users** to:
  - necessary activities
  - preventive maintenance
  - ecological implications and limits
- **Dialogue, confidence, understanding, willingness of partners to participate** (self reliance) and the ability to express and to accept constructive criticism, preparedness to learn
- **Each evaluation must bear concrete results**, e.g., the initiation of management decisions, clear target recommendations, etc. Conclusions should be realistic with regard to volume, prioritisation, and scheduling of targets.
- The results of evaluations (internal or external) should be **available within a short time** (to avoid suspicion and to assure optimal efficiency and effectiveness).
- The influencability of certain problems/aspects should be considered.

## The actors and their roles

Water and sanitation projects tend to involve a wide variety of stakeholders. All of them are potential users and/or providers of information. MEPI will depend on all the actors knowing the decision and competence structure (who decides on what?) and on the different parties keeping each other informed.

By means of the Water and Sanitation Knowledge System (WSKS) which was developed at the AGUASAN workshop in 1992 the various actors and parties involved in a given water project can be identified ([Section 2](#)).

**The interest and willingness of the actors to participate in data gathering activities will depend to a large extent on how relevant and applicable the data are for them.** If they are involved in determining their own data needs and if the

results flow back to them as users this will act as an incentive to their participation in data gathering activities. Monitoring and reporting should be defined already in job descriptions.

The case of the Kibwezi Water Project in Kenya proves the importance of user engagement in M+E. A community Wells Committee initiated an evaluation which included a survey of water quality in people's homes. Committee members quickly learnt how to use bacterial dip-slides to test for water pollution. The visual evidence of the bacteria growing on the dip-slides made a lasting impression on the householders, and greatly supported their understanding of disease transmission. The committee was able to draw up a plan of action that included repairs, education of community members and appropriate chlorination.

### **Indicators / parameters**

**What are the important, observable parameters**, the right indicators of progress and problems to be monitored? In the different stages of a project (Figure 32) the requirements are not always the same. Figure 37 shows the basic elements for monitoring. **Once again it is emphasised that monitoring should be concentrated to the necessary minimum - short, objective and quantitative as far as possible.**

To facilitate the choice of suitable indicators, four criteria have been developed:

- valid
- reliable
- sensitive
- specific

**M+E of efficiency is part of the project implementation and of O+M** (B 4 and B 5). Effectiveness should primarily be evaluated on indicators related to the three overall objectives: sustainability, effective use of services and replicability (of projects, development models).

**Impact indicators, e.g., health or economic benefits are more difficult to define.** Often such indicators incorporate known and unknown causal links. Projects may have different impacts (health, socio-economic) which can complicate the isolation of specific benefits that are attributable to a better water supply situation. Determining the health impact of water and sanitation projects is complicated by the fact that the available indicators often do not meet the four criteria mentioned above. The basic principle is to monitor a variety of social and health indicators that are specific to water and water use together. So, for example, it is known that frequent face washing can reduce incidents of the eye disease trachoma. The relationship between these two indicators can be studied using case-control methodology which involves comparing data from a healthy group of respondents with an unhealthy group (trachoma victims) and analysing how their hygiene habits (face washing) differ. If the healthy group was found to have a higher incident of face washing and if this habit could be attributed directly to the availability of clean water from an improved water supply, then the project could be said to have a definite health impact.

**Financial monitoring** as a particular element of implementation is described in B 4.4. For environmental monitoring, see A 2.2, C 3.7 and 3.8.



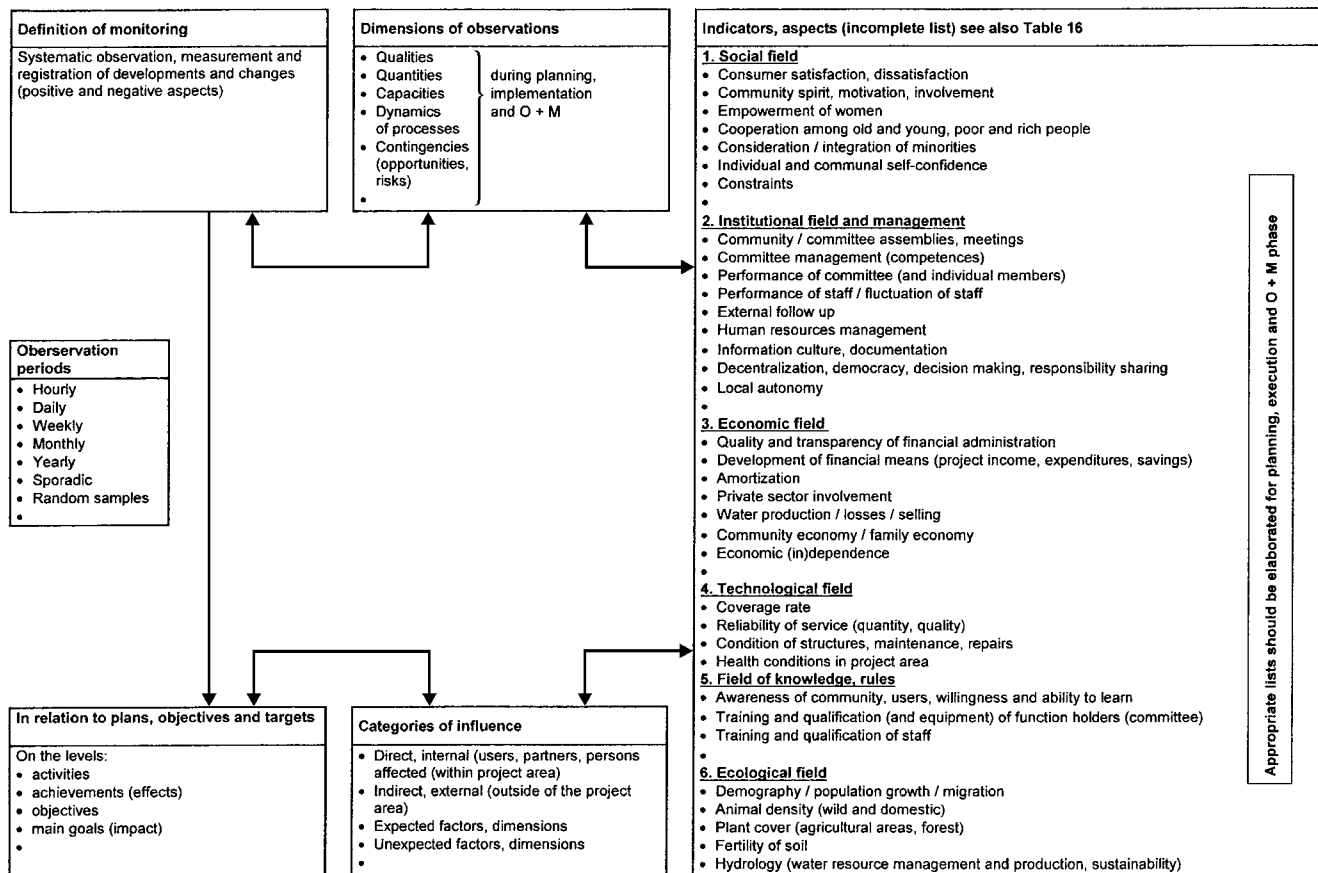


Figure 37: Basic elements of monitoring (Form Appendix M. 16)

**Types of evaluations**

There are *different types of evaluation* and different terms are used. The AGUASAN workshop in 1989 identified *five common types*:

- **Project Preparation**, which aims at appraising an existing situation and *evaluating the need for a project*
- **In-Built Evaluation** consists of continuous tasks that become an integral part of the project and provide regular information
- **External Evaluation**, which involves external independent specialists and usually takes place after certain changes have occurred
- **Ex-Post-Evaluation** takes place after the completion of a project or project phase to learn from its experience so that this may be incorporated into the formulation of new projects
- **Cross-Analysis** involves comparing the results of external evaluations of different projects in the same sector.

**Planning and implementation of MEPI**

A clear and accepted project framework with defined aims and objectives is a pre-condition for MEPI. The key actors including the users should define what role M+E could play in ensuring the achievement of the aims and objectives.

The first step is to make an initial *assessment of the availability of existing M+E concepts and systems* in the project and of how these may be improved upon. This will involve examining the whole decision making process and considering who needs what information when, to initiate corrective measures.



The actors should then consider *MEPI at the three different levels* of the project framework: *efficiency, effectiveness and impact* (Figure 32). *At each one of these levels they will need to formulate:*

- the *key issues* to be addressed
- the *relevant indicators* to be used
- the *methodologies* to be employed

Then the data and information to be monitored and evaluated need to be specified. In order to reduce data collection time the monitoring process must be carefully co-ordinated. Organisationally the following options can be considered for the setting up and implementation of MEPI:

- the project employs external experts to support the team in setting up a MEPI system
- the MEPI system can be set up by the project team in the course of regular work
- the project has its own MEPI unit
- the project employs external experts to conduct certain elements or aspects of the data collection or evaluation
- combinations of the above options as required

### **Monitoring technique**

*Three basic questions* should be considered when developing a monitoring concept:

- *What data and background information*, in what quantity and quality, are needed for an assessment of achievements and for optimal project management?
- *How can the data be collected and by whom?* Is information already available from other institutions?
- *How must the data be conditioned to become useful*, practicable information, transferable to operational plans?

These three questions must be answered systematically and objectively in a democratic and transparent process in which the people concerned are involved. *People involved in monitoring are contributors and recipients of information at the same time.* Using some of their time for monitoring they are at the same time learning more from their own experiences.

Basic elements of monitoring are listed in Figure 37, which can be of help in developing appropriate systems.

*The collection of information can consume a significant amount of time and working capacity.* If a high degree of precision is not required, it might be possible to use simpler methods like sample surveys. It is also quite important to identify appropriate observation intervals. Decentralisation of observation work, based on reliable local partners, can also contribute to cost reduction. Sometimes visual observation might give even better and more correct results than complicated, work-intensive surveys with questionnaires (e.g. type, size and quality of houses can indicate the economic situation of people).

The applied monitoring objectives and the strategy for acquiring information should be verified periodically. Often it is not enough to observe and measure a certain indicator; it might be necessary to monitor the boundary conditions, too, which can influence the parameters. A clear concept and standards are essential, particularly where several observers or groups are working.

In particular cases, photography can serve as a valuable instrument to explain complex situations or show changes to a place or an object. Clear indications are indispensable: numbering, date, time, location etc.

**Impact monitoring and its evaluation is a long-term process.** Should it be done in water projects? A few key parameters that indicate the possible impact of water projects should be observed. Such parameters depend normally not only on a water project but on conditions and activities in various sectors. Therefore it might be difficult to allocate the different effects of a project to a particular impact. However, a rough allocation might be possible and of vital interest. Impact monitoring should be done in inter-sectoral and inter-departmental co-operation, e.g. health statistics from health services can be of interest to the water authorities and the health workers might need information on water supply.

**Each project needs its own individual monitoring system.** M+E should not develop by chance; rather a concept should be worked out systematically. A draft model can be implemented and refined during application. In major projects it can be very useful to work out a manual for MEPI. Checklists too can be of help; however, they should not lead to unnecessary floods of data or to the illusion of completion.

### **Reporting - a monitoring instrument**

(refer to Table 24)

**Reporting (in oral or written form) is the element linking monitoring with evaluation.** Reports are the most common source of information (B 4). The creation of project documents means that experience, findings, recommendations and proposals have to be translated into a written form which is understandable to the intended readers. Reports are useful instruments not only for the project partners who receive and read them but also for the people who write them.

#### **Principal checklist for reporting:**

- Title, indicating the content and the report period, date, author's name, number, etc.
- What are the important messages in the view of the author?
- What information do the recipients need (substance, quality, reliability, form, volume, frequency)?
- What degree of precision is appropriate? (For example, the daily water consumption of a village is 18 m<sup>3</sup>, and not 17.891 m<sup>3</sup>).
- Is it possible to use the same reports (entirely or in part) for different purposes?
- What explanations and interpretations are useful or necessary in addition to statistical monitoring data, tables and graphs?
- What reporting items can easily be presented in graphs or tables? Such presentations make reports more understandable and shorter.
- Would it be helpful to use standard lists of contents?
- Sources used and location should be mentioned.

Table 24 is a list of different types of reports used in a rural water supply programme in Cameroon. Financial reporting is discussed in [B 4.4](#).

Document, report	Before implemen- tation	During implemen- tation	O + M phase	Remarks
Report on catchment area, 1 <sup>st</sup> visit	x			
Report on catchment area, 2 <sup>nd</sup> visit		x (End)		
Socio-economic questionnaire	x			
Minutes of 1 <sup>st</sup> project visit	x			
Feasibility study report	x			
Technical report	x			
Village quarterly report		x (3 months)		
Executing body quarterly report		x (3 months)		
Checklist and minutes of project visits		x		Frequent
Monthly expenditure account by executing body		x (1 month)		
Helvetas quarterly statement of account		x (3 months)		
Final settlement of account		x (End)		
Evaluation of performance executing body		x		Periodically
Project final report		x (End)		
Data base for water supply project		x (End)		Form
Handing over letter and duty sheets for MC + CT		x (End)		
Instruction manual (pumps, turbines, filters)		x (End)		
Legal documents and map of catchment area		x (End)		
Project file (drawings, documents)		x (End)		
O + M checklist		x (End)	x	
Form for monitoring data + rating			x	

Table 24:

*Reporting system - an example from Cameroon*

**SWPO** is a method with a very simple structure to evaluate results, as successes and failures (Review of past activities), opportunities or potentials and threats or problems (Future perspectives). All the activities are set in order of hierarchy, from base to top or from community to institution.

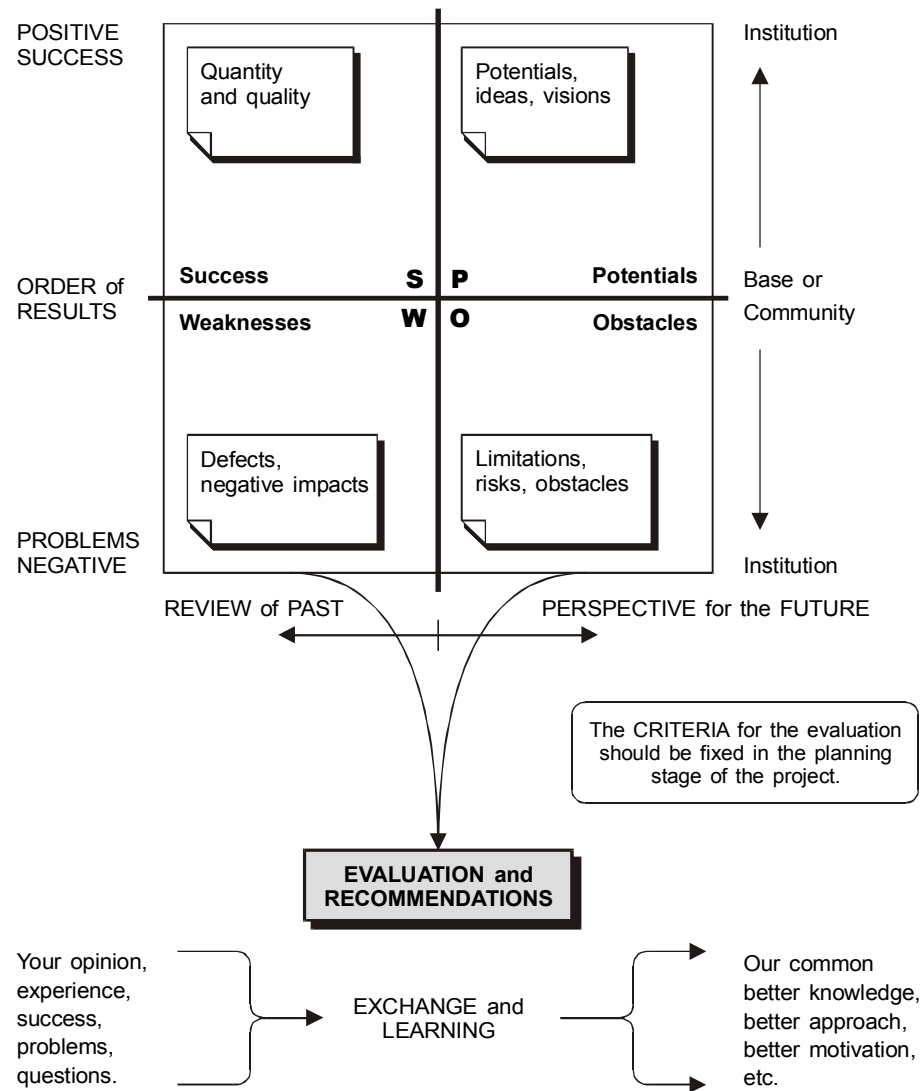


Figure 38: The SWPO method (Form Appendix M.17)

**SWPO-method**

*The easy and highly participative SWPO method (Appendix F.2) is a successful, simple and effective evaluation technique which is applicable to internal and external evaluations. The structuring of aspects/topics in the four quadrants Successes and Weaknesses (in the past) and Potentials and Obstacles (in the future) help to clarify the nature and dimensions of problems and the strategies to follow.* Dialogue and the direct participation of the people concerned are easy, especially when the discussion develops with the help of visual aids, e.g. a pin-board. The starting point should always be with **S**uccesses: then the failures and problems should be defined and brought to the board. After that the future is envisaged (potentials/obstacles).

*The principles of this tool can be summarised as follows:*

- build on what the actors know
- use their knowledge and abilities to conduct a self-evaluation

- encourage the actors to see the effect of their work on the project's objectives
- assess how balanced expenditures and measures have been
- encourage visions beyond immediate objectives
- strengthen awareness of joint responsibility

The 'SWPO' method is illustrated in Figure 38.

SWPO is applicable to single activities with different actors/evaluators or to groups of activities. The periods of consideration (backwards and forwards) must be discussed and defined.

The clear and comprehensive link from monitoring, through analytical, objective evaluation to pertinent steering/management is a remarkable advantage of the SWPO method. This evaluation instrument is also helpful in the promotion of motivation and autonomy.

### **Participatory rural appraisal (PRA)**

The so-called Participatory Rural Appraisal method (PRA), developed *for rapid project or problem evaluation in co-operation with the population* concerned, is explained in [Appendix F. 1](#).

### **Practical hints for M+E**

- ***As a first step it is important to find out what data and information have already been collected.*** This information can be obtained from relevant institutions, reports, other publications, maps, etc.  
The collection of quantifiable and precise data usually requires a lot of time and is appropriate only for M+E of efficiency. However, for M+E of effectiveness, where qualitative aspects have to be considered, it is recommended to use only a few indicators which will provide hints regarding the order of magnitude and trends. This can be complemented by regular in-depth studies (PRA).  
Besides information received in written form (reports, questionnaires, etc.), verbal and more informal channels are equally important.
- ***The selection of the monitoring method depends on the aspects to be observed and on the socio-cultural context of the project.*** The application of certain data collection methods requires experience more than specific knowledge. Such experience is usually acquired by the project team during the day-to-day M+E.  
There are, on the other hand, methods which require specific knowledge to conduct a conceptually and methodologically sound data collection. In this case a project might consider employing external consultants with the relevant expertise who can then train project staff accordingly.
- The assessment, evaluation and documentation of information covering various aspects of the project should be done on the day of collection.
- ***It is important to distinguish between evaluation and decisions.*** During the evaluation process experiences are being discussed which thereafter form the basis for the formulation of proposals for discussion. However, decisions are not yet made at this point.
- The existence of a MEPI system does not guarantee the success of a project. ***The limits of MEPI have to be clearly seen in order to make realistic use of it.*** M+E does not replace decisions but provides the basic information to observe the efficiency and effectiveness of the project. Nevertheless, based on the evaluation, decisions on whether or not corrective measures need to be introduced should be made.
- ***M+E must remain simple, limited to the required dimensions and affordable.*** In many cases it is advisable to concentrate on a few really important parameters. (The time and effort necessary to analyse the data and to put them into a suitable form for presentation should not be underestimated).

- Inputs and outputs (results) of MEPI need to be balanced. Never forget to apply common sense. Regular visits to the field and meeting villagers can be more effective and informative than extensive data collection and trials of interpretation.
- ***It is better to be approximately correct and on time with a reasonable input, than to be precise, costly, late and perhaps even wrong.***

### 5.3 Documentation and filing system

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#### Preparation of data and information

**Monitoring data need to be put into the appropriate form (quantitatively and qualitatively)**, in order that the recipients (management, committee, partners, donors, etc.) of such information can access the message and understand the situation.

**Good, accessible documentation** is useful for:

- efficient organisation of work
- reference in case of problems
- planning of project extensions, etc.

To make data processing and reporting efficient and effective, monitoring forms, caretaker logbooks, etc. should be worked out under consideration of the future handling of data. **Presentations in graphical form are easier to read than large tables (Figure 39)**. Photography (with good comments) can also facilitate understanding and help to keep reports short and more meaningful.

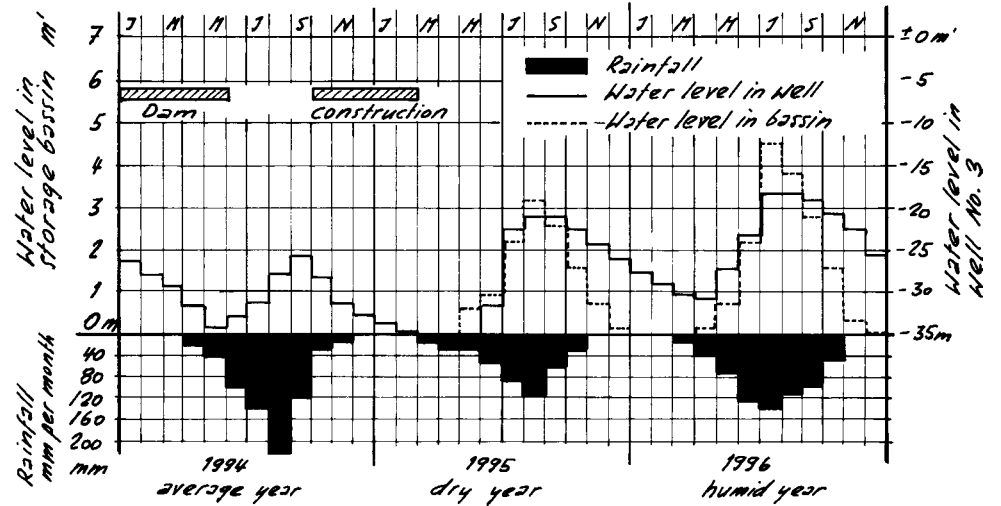
In cases where computers and Electronic Data Processing (EDP) are used a data management concept including a data backup system as well as proper software handling, service and maintenance facilities should be available.

#### Documentation and filing

**Systematic, practical documentation is necessary** not only for the secretary who looks after the filing, but also for the chairperson, treasurer, caretaker, etc. The development of a good documentation system normally requires external assistance, which should also guarantee standardisation within a department or regional institution. The development and implementation of such systems should involve local participation and support. Documents should be kept in safe, dry places. **Co-ordination and compatibility with external documentation** (departmental headquarters, technical office, etc.) is essential for decentralised programmes.

Beyond a certain size of project, simple chronological filing is no longer practical. **Table 25 shows a filing system proposed for a major water supply project in Kenya**. Within the files, chronological order is advisable in most cases. Each drawing, letter, report, guideline, contract, etc. must contain a date and the name of the author, and usually also a registration number. If a document is revised, the new date must be added.

For committee members, caretakers and other collaborators it is adequate to transfer periodically the main part of the individual documentation (raw material, logbooks, forms, statistics, reports, etc.) which is more than about two years old to the main archive, which is normally kept by the secretary.



GRAPHIC PRESENTATION (easier to understand)

Development / comparison of precipitation and water levels in the dammed basin and in the groundwater well No. 3

PRESENTATION IN FORM OF A TABLE

Period	Precipitation in mm/month	Water level in the basin (gauging station) m	Water level in well No. 3 (m from top)
1994			
January	---		-26
February	---		-27
March	---		-29
April	20		-32
May	40		-34
June	100		-33
July	140		-31
August	220		-28
September	120		-26
October	30		-28
November	15		-32
December	---		-33
1995			
January	---		-34
February	---		-35
March	15		-36
April	30		-37
May	30	0.60	-35
June	50	0.90	-32
July	90	2.40	-23
August	120	3.20	-21
September	60	2.60	-21
October	30	1.60	-23
November	---	0.60	-24
December	---	0.20	-26
1996			
January	---		-28
February	---		-29
March	15		-30
April	40	0.20	-31
May	75	0.70	-27
June	125	2.40	-23
July	135	4.60	-18
August	115	3.80	-18
September	100	2.90	-19
October	45	1.60	-21
November	---	0.40	-23
December	---	---	-25

Figure 39: Graphs, diagrams instead of tables

Filing system	Tertiary files (horizontal combinations possible)		G GENERAL	DM DIOCESE MERU	MC MUKULULU CAMP	LC LARE CAMP	KS KANGETA SUPPLY AREA	LS LARE SUPPLY AREA	MS MUTUATY SUPPLY AREA
	Main files	Secondary files							
Administration General	01	General							
	02	Staff (see also F03, M03)							
	03	Legal matters (laws, court cases)							
	04	Information, public relations							
	05								
	06	Other water projects within TWS							
	07	Government contracts (MOWO)							
	08								
	09	Climatic data, water flows (natural)							
	10								
Development General	01	Generalak (+ policy, visions)							
	02	Development coordination							
	03	Health, hygiene							
	04	Agriculture, erosion control							
	05	Social development							
	06	Schools, education							
	07	Population growth							
	08	Community mobilization							
	09								
	10								
Construction	01	General							
	02	Standards, regulations, laws							
	03	Projects general							
	04								
	05	Individual project files, main structures							
	06	Individual project files, local distribution							
	07								
	08								
	09								
	10								
Financial Administration	01	General							
	02	Project financing							
	03	Salaries (see also A02)							
	04								
	05	Water rates, tariffs							
	06	Sale of water							
	07	Budgets TWS							
	08	Bookkeeping TWS							
	09								
	10	Petrol station (see also O10)							
Meetings	01	General							
	02	TWS-Board							
	03	Staff meetings (see also A02)							
	04								
	05	Development meetings							
	06								
	07								
	08								
	09								
	10	Other meetings							
Operation Maintenance Repairs (incl. Monitoring)	01	General							
	02	Water statistics (production+ sale + free)							
	03	Consumer contacts							
	04	Intakes							
	05	Mukululu camp + workshop + stock							
	06	Lare Camp + stock							
	07	Distribution							
	08	Storage							
	09	Vehicles and houses							
	10	Petrol station (see also F10)							

Table 25: Filing system - an example from Kenya (Form Appendix M. 18)



### **Photographic documentation**

Photographic documentation needs particular consideration and attention. For financial and technical reasons it is in many cases not advisable for small projects to have their own camera and photo documentation. The external support agency (governmental or non-governmental) that follows a local programme should use periodic visits to take representative photographs. This more centralised solution has several advantages:

- It is more economical and professional.
- There is a possibility of learning from others (distribution, exchange of photos).

Copies of the important photos, with exact date, location, comments and recommendations should be forwarded to the project. The systematic filing of films, slides, photos and discs requires special care.

### **Practical hints**

- If possible the initial records should be the definitive monitoring material which is filed. (Rewriting bears the risk of mistakes).
- Monitoring data and other papers should be integrated properly into the files on a daily or weekly basis, depending on the importance and volume of material. Reports and drawings should be copied in order to have working copies, which can be taken to the field while the originals remain in the files.
- The secretary should keep all papers or data until they are at least 10 years old. A good portion of statistical data that are over 10 years old normally can be thrown away.

In any case, the following documents should be retained for a much longer period:

- minutes of meetings and assemblies
- technical reports and drawings (as-built plans)
- periodical reports and financial statements
- contracts, agreements and other legal documents (in force and expired)
- important correspondence and other key documents

- Collaborators who bring material to the project archives (about every 2 years) could classify the bundles not only according the filing system, but also in the two clearly marked categories:

L: Long-term archives

T: Temporary archives ('to be thrown away after 10 years without looking at it again').

- Authors and suppliers of raw information e.g. a caretaker, must have access to their previously supplied data. Material from the archives can be given out only temporarily and against a receipt.

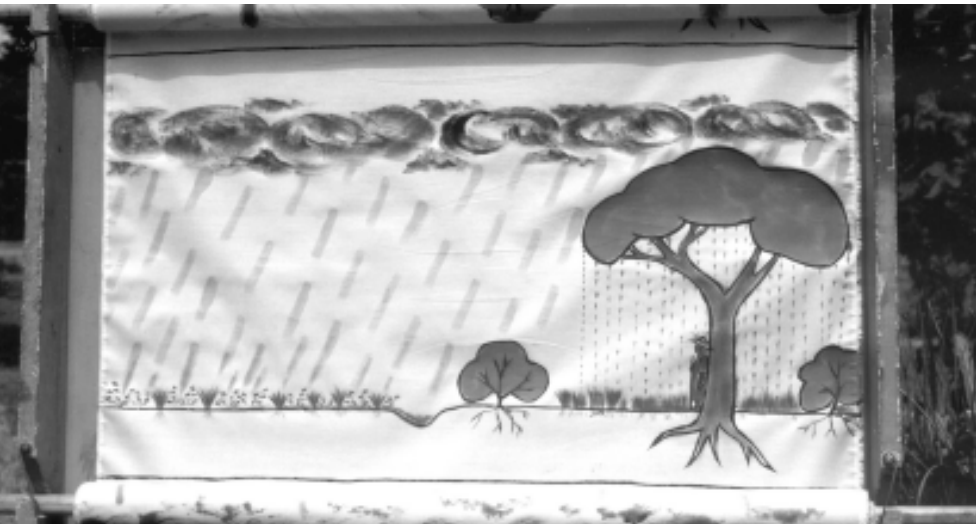
If the main archives have to be cleared out (throwing away other than expired 'T-documents') this should not be done by the secretary alone. With him/her, the president and one other member of the committee have to make the final decisions.



On the job training



Appropriate training tools



Democratic learning processes

## 6. HUMAN RESOURCE AND INSTITUTIONAL DEVELOPMENT (HRD + ID)

### 6.1 Introduction

#### *Purpose - Scope*

The aim of comprehensive Human Resource Development (HRD) and Institutional Development (ID) is to enhance the capacity of local communities and of local institutions and agencies to plan, design, construct and maintain sustainable water supply and sanitation systems. HRD and ID are indispensable in achieving two key objectives:

- ***Sustainable services, facilities***
- ***Sustainable organisations to maintain the services and facilities.***

In traditional life (social organisation, agriculture, craftsmanship, etc.) HRD and ID are very common. If we talk about it in connection with water and sanitation projects, it might be helpful to relate it to the past experiences of a society.

The principles of rules and knowledge are fundamental to HRD and ID. The whole of [A 3](#) (Basic principles) discusses external conditions which promote an environment for optimal learning.

***The success of projects depends on personal efficiency and motivation.*** Professional training builds both competence and confidence. A well-planned national programme of HRD, based on an assessment of needs, should be at the core of any country strategy. It should reflect the need for partnership in sustainable sector development between government, communities, the private sector, and NGOs, and should develop appropriate skills at all levels. It should also recognise the particular needs of women, and ensure equal training and employment opportunities.

HRD means not only training of people but includes also their career development and is therefore closely linked to ID and to long-term staff requirements.

#### *Main ideas of HRD and ID*

***HRD and ID need to be well-defined elements of sector strategies and long-term project plans. Training must be based on clear objectives. Learning follows a process which leads to more awareness (knowledge transfer → skills → behavioural change).***

Technical assistance and training on project level are extremely important and must be provided to communities. Originally it was assumed that if communities had access to favourable credit, they could finance and build water and sanitation systems with minimal external assistance and supervision. This assumption has been proved false. Where technical assistance, training, and supervision to communities have been minimal, quality of construction management, and hence the reliability of projects, have suffered. ***Training is necessary not only for technicians, caretakers and mechanics, but also for system managers, committee members, facilitators in health and hygiene, and for all others involved in project implementation and operation.*** Refresher training is fundamental since the actors may come to realise the importance of training only through confrontation with problems in practice. This is the case with many water committees. They may require periodic training inputs over five or even more years after the completion of a project. Individual training is important, but the success of projects depends even more on how individuals co-operate within institutions. Therefore, local institutional development towards team spirit and transparency (knowing each other's tasks and opinions) among the project partners is important. The consumers need also to be trained in order to use systems optimally, with care and in solidarity.

Although some training may be required from external sources, community members themselves should be trained to pass on their skills to others. Trainers, capacity builders, and facilitators need to be adequately trained before they are able to transfer knowledge and skills to trainees. Apart from specific subject-oriented know-how, they need good background knowledge in cultural, social and teaching aspects.

### Key objectives

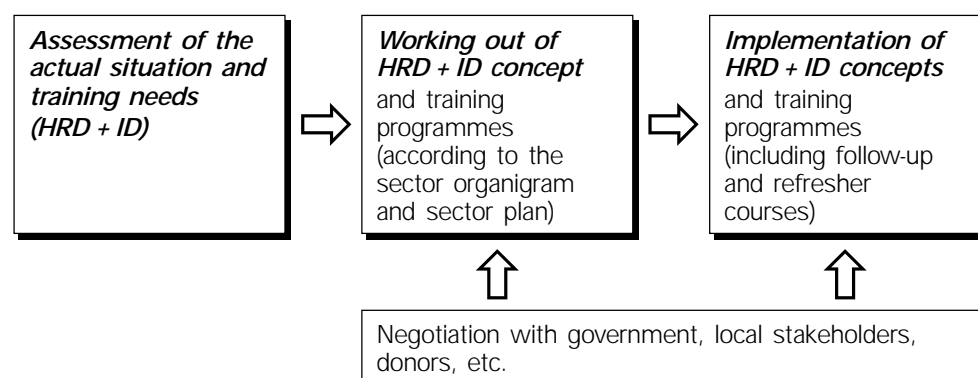
- **Independence and autonomy** (individual responsibility and community self-reliance) *through HRD and ID*
- Formal teaching, short courses, learning-by-doing and all intermediate forms of training are relevant; **learning from experience** is most effective (reality awareness). Allow different learning methods, e.g. teaching and demonstration. Participative methods are most effective.
- Training should relate to the trainees' practical situation and cultural context (**job-relevance**).
- **Continuous and 'preventive' training before problems arise**; allow and promote learning processes (with errors, too)
- **Defined, written and approved concepts** (objectives, targets, programmes, duty sheets, entrance conditions, institutional concepts, syllabuses, exams, etc.)
- Training should also promote the **ability to realise limitations** and to mobilise and to accept assistance.
- **Use synergies**, e.g. combination of health and sanitation message with literacy campaigns
- **Qualified committed trainers** who are professionally and socially accepted, familiar with the project and with the local context and open to new situations (**improvisation capability, ability to listen to and integrate the participants' ideas**).
- Qualification of trainees: fulfilment of entrance conditions, **ability and preparedness to learn independently and individually**. Trainees should also act as trainers (multiplication effects).

## 6.2 Concepts for HRD and ID

### Analysis of the existing situation and training needs

Too often, training needs are only considered at the level of immediate requirements at the job site. This can lead to ignorance of the sector plan goals and to an underestimation of long-term requirements.

**Strategies for formal training and institution building follow a three-step path:**



**Assessment of HRD + ID needs**

- Specification of training capacity requirements according to mid- and long-term sector goals
- Availability (quantity and quality) of existing training services, skills and capacities (public, NGOs, private sector)
- Needs assessment, both institutionally (incl. staff requirements), as well as for specific training
- Review of job descriptions and duty sheets of trainers and potential for outsourcing
- Assessment of quality and efficiency of existing training, identification of additional local resources and of gaps to be filled by external assistance

**New approaches require new skills**

**With decentralisation and local management, the training of community members has become more important.** During the planning stage agency workers should help the community to identify and train people required for all the relevant functions of community management. The community will know reliable and qualified people. Therefore, they are responsible (with some external assistance) for selecting the right people for the various jobs.

An evaluation of tasks, responsibilities and workload of each community worker, such as caretakers, scheme attendants, treasurers and community hygiene educators, makes it easier to choose the right candidates for the appropriate training.

**The partnership approach also calls for new skills and techniques for agency staff and external workers,** which are not generally part of their prior training. New staff may have to be recruited, or existing staff may be retrained in motivating and assisting communities in the development of community-based approaches.

Where the follow-up of communities or the execution of projects is delegated to the private sector, the quality of service depends directly on the private sector's own training and qualifications. It remains the government's responsibility to guarantee and supervise such training.

**Checklist for working out of training programmes**

Based on the above-mentioned needs assessment:

- Formulation of **training plans** (syllabus, programmes and budgets)
- **Liaison, co-ordination and collaboration** with the relevant national and regional training institutions and programmes to utilise synergies and to enhance (cost-)effectiveness
- **Assessment of trainers' needs**, followed by development and implementation of training of trainers (TOT)
- Preparation of **manuals for trainers** (courses, lessons, teaching material, etc.). The involvement of the trainers is absolutely necessary at this stage for reasons of commitment and identification.
- Definition of the most effective **training methods** for the different subjects (Section 6.4)
- Establishing **administrative routines for the organisation of courses**; including recruitment procedure, entrance criteria, course fees, scholarships, etc.
- Implementation and **supervision of training** courses including practical stages, study tours, M+E of training activities
- Setting up the necessary **infrastructure for training**

Figure 40 shows the usual steps of a training programme.

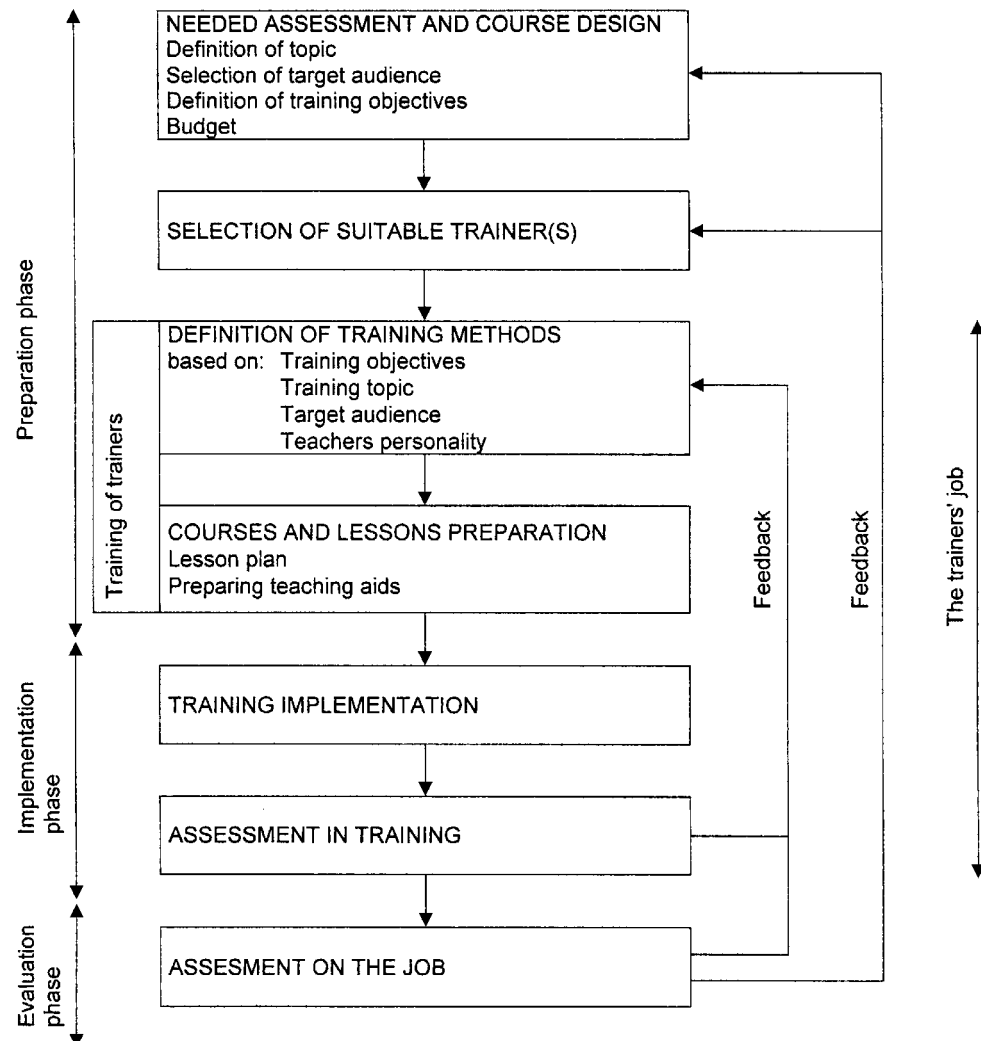


Figure 40: The steps of a training concept/programme

### Community training

For community management training activities particular aspects need to be considered:

- The **village development vision** is an important motivator (historical development, experiences, expectations, needs, concepts and strategies).
- **Social organisation** and culture (processes yesterday - today - tomorrow, work organisation, flow of information, administration, mobilising the community, problem awareness)
- **Leadership** (identification, nature and characteristics of leaders, traditional versus modern leaders, need for education of leaders)
- **Group dynamics** (nature and type of groups, gender balance, dynamics that work in the groups, diagnosis of group needs, identification and resolution of group problems and conflicts, motivation and decision-making processes)
- **Education by individual subject or integrated for specific audiences**
- **Developing and introducing a suitable system for optimal legal and democratic functioning of committees** (constitution, (re)elections, information, transparency).

Various training courses and the respective target audience are summarised in a matrix diagram (Table 26). It provides an overview that helps to define appropriate community education. The diagram is very general; it should be adapted to specific situations.

Types of training		Target audience	Regional participants						Local participants														
			Parastatal institution	Private sector	NGOs (staff and leaders)	Government			Project committees, population						Government Officials								
						Territ. administration	Water sector auth.	Members of parliam.	Chair person	Secretary	Treasurer	Caretaker, operators	Users	Women	Farmers	Old / young people	Local leaders	Social workers	Water authorities	Health workes	Administrators		
Formal Training	Indepth training (certificate)	Courses																					
		Basic trades (apprenticeship) 3 - 4 years Masonry / caprentry / social advisor ...		●	●			●											●	●	●	○	
		Engineering		○	●			●												○			
		Management		○	○	●		○	○														
		Administration			●	●		●	○														
	Trainers training		●	○			○																
	Short courses	Basic training for function holders in committees			○	○		○	○		●	●	●	●					●	●	●	●	
		Sectoral training, initial		○	●	●			●	○	●	●	●	●	●	●	●	●	●	●	●	○	
		Sectoral training, follow up		○	●	●			●		●	●	●	●	●	●	●	●	●	●	●	○	
		Intersectoral cooperation		●	●	●		○	●	○	●	○	○	●	○	○	○	○	○	●	●	●	●
Communication			●	●	●		○	●	○	●	●	○	○				○	●	●	●	●		
Management		●	●	●		○	●		●	●	●	○					○	●	○	○			
Informal, sporadic	Monitoring / evaluation / steering		●	●	●		●		○	●	○	●						○	●	○	○		
	On the job training		●	●	●			○		●	●	●	●	●	●	●	●	●	●	●	●		
	Meetings / reporting		○	●	○		●			●	●	●	●				○	●	●	●	●		
	Visits / exchange of experiences		●	●	○		○	●	○	●	●	●	●	●	○	●	○	●	●	○	○		
	Competitions			●	○			○		●	○	●	●	●		○	●	○	○	○	○		

Table 26: Types of training and target audiences

### 6.3 Moderation technique

#### Purpose - Scope

The participation of the people concerned, a sense of ownership, decision making and self-reliance cannot be sufficiently promoted using traditional teaching methods. Nowadays, *institutions are in a process of democratisation. Hierarchical structures are no longer accepted* because they do not allow the solution of problems in optimal ways. *Participation in learning requires new, or modified teaching methods.* What trainees are going to do in their daily work they should practice already during training.

*Moderation is a visual method allowing the facilitation and structuring of group processes* (learning, management, decision-making). The moderator is neither the boss nor the teacher who knows better and who is familiar with the 'essentials'. He or she is a methodological helper, a catalyst or a 'midwife' in a problem situation. *The moderator/facilitator is a creative specialist in the 'how' of communication.*

The moderation method is a mixture of planning and visualisation techniques, of group dynamics and guided discussion in a creativity-promoting social atmosphere of transparency, openness and trust. The moderation techniques allow illiterate and literate people to participate in the process equally and to generate collective knowledge and know-how.

Moderation and facilitation is a working style that can be applied to different learning methods. SWPO is a typical tool that requires good moderation. It is also very suitable for structuring and promoting conventional meetings and managing conflicts towards more effective and efficient results.

### Objectives of moderation

- **Better communication**, self-motivation and team spirit
- So-called **decision-makers are brought together with people affected by their decisions** - to find creative solutions together.
- To find clear results and conclusions within an appropriate period
- Moderation makes **training processes learner-centred**. The participants become aware of problems and conflicts in the learning process.
- Comparison of subjective views and promotion of openness, **inter-disciplinary and holistic views**; people with different opinions should find compromises
- To promote the preparedness to **accept and include uncertainty**
- **Stimulation of people's memory** about past and present situations; to get participants to reflect on the constraints of their own organisations and to discuss them openly in the group
- Moderation techniques should not be followed in a slave-like manner. With **creativity and improvisation** the moderators and the participants should develop their own procedures.
- Clear **priorities and easily remembered key messages**, information inputs and conclusions through visual presentation (few words and figures)
- **Positive and informed opinion development** through fair moderation (not manipulation) of group dynamics

### Determining factors

- **Who is the target group?** Is it made up hierarchically, functionally, according to interests? What do participants want, what do they know? Do they have experience with the moderation method?
- **What conditions and objectives are already fixed?**
- **What conflicts and problems could arise?**
- **Moderators should refrain from expressing their own opinion and values.** During sessions they do not judge opinions. They are inquisitive, and ask questions to activate and to open up the participants. The moderator does not discuss the method, but uses it. Normally, the moderation is done by a team of two persons. Where a moderator is personally involved with the group and their problem, they must make clear at all times when they are functioning as a moderator and when they are expressing their own opinion as a member of the group.
- **The trainers'/moderators' level of engagement varies during a workshop session** (Figure 41). In the initial phase basic information is needed, conditions for learning and methodological tools must be transmitted, problems and objectives defined, etc.

Increasingly, the group develops its own dynamism and creativity. Group work allows the moderator to give room for group initiatives. His/her function shifts more to that of a controller/facilitator. In the third phase of a session the moderators begin to reassert initiative and authority in order to lead the participants from action to reflection: drawing of conclusions, lessons learnt, strategies to follow, etc.

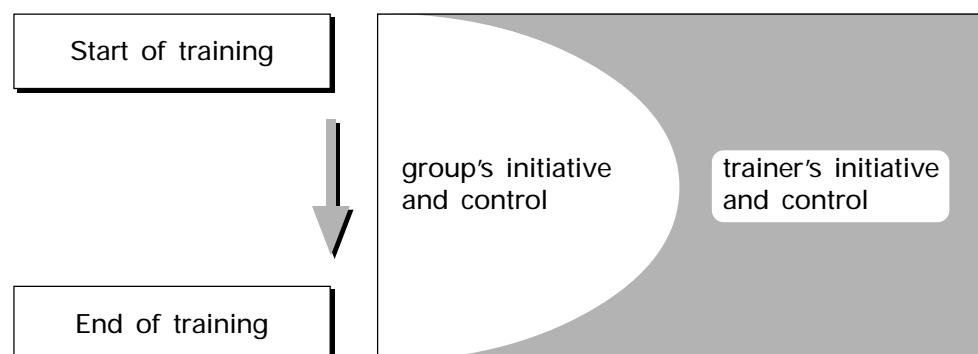


Figure 41:

*Development of (inter-)action and control during a training session*



## 6.4 Training and teaching-techniques and methods

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### *Purpose - Scope*

**Both theoretical knowledge and practical skills have to be taught.** Learning is understood as a participative process and hence is much more than attending lectures. Three particular activities/situations facilitate effective and lasting learning:

- **Learning by doing**
- **Learning through individual experiences**
- **Mutual learning through exchange of experiences.**

Participatory training techniques, where people learn through group involvement, are particularly important when dealing with socio-cultural issues. In technical training too, group work and exchange of experience are helpful and necessary.

Capacity building within the community may benefit from specialised learning techniques, among which conventional training is only one element. Community management can be supported through the development of a learning process which reinforces the partnership between agencies and communities by acknowledging everyone as both a learner and a teacher, and also by encouraging the development of learning relationships within and between communities.

Apart from training activities, other ways to learn include the establishment of monitoring and evaluation systems, the development of participatory problem-solving methods, the holding of meetings, and the pooling of resources through networking systems.

Training methods are the tools of the trainer as well as of the trainees. It is not possible to specify a particular method and to define readymade recipes that would be best for a particular subject. The selection of the right method depends on the one hand on the training target and on the other hand on the trainees and the personality of the trainer(s).

### *Principal methods*

**The most common and successful teaching methods and interacting forms are:**

- Frontal teaching (formal training)
- Individual work and partner work
- Discussions, meetings
- Group learning, workshops
- Demonstrations, instructions, on-the-job training
- Excursions.

During a session more than one method may be used. Each has its advantages and disadvantages, and none of them is completely adequate for each learning objective and content.

Table 27 is a general view of teaching methods and their application.

	Frontal teaching A	Individual working Partner work B	Discussions Meetings C	Group learning D	Demonstrations, Instruction, On-the-job training E	Excursions F
"Rules of the game"	<ul style="list-style-type: none"> <li>- Traditional method</li> <li>- Trainer in front, centre of attention</li> <li>- Trainer speaks, leads, controls</li> <li>- Media: blackboard, overhead projection, flipcharts</li> </ul>	<ul style="list-style-type: none"> <li>- Working alone or with one partner</li> <li>- Assignments must be clearly formulated (written form)</li> <li>- Trainer watches, helps when and where necessary</li> </ul>	<ul style="list-style-type: none"> <li>- One person is the moderator, the others participants</li> <li>- Debate, panel discussion, dispute</li> </ul>	<ul style="list-style-type: none"> <li>- Can be used to break the monotony of frontal teaching</li> <li>- After introduction forming of small groups</li> <li>- Assignments clearly formulated, written form</li> <li>- Individual group work</li> <li>- Selection of a group leader (moderator)</li> <li>- Clear time schedule</li> <li>- Results compiled and presented in plenary</li> </ul>	<ul style="list-style-type: none"> <li>- Step by step approach (each step needs teaching, practising, checking)</li> <li>- Enhancing trainees independence (learning by doing)</li> <li>- Make clear the key-points</li> <li>- Many activities need to be practised again and again</li> <li>- Theory and practice should go hand in hand</li> </ul>	<ul style="list-style-type: none"> <li>- One to one contact with institutions, construction sites, etc.</li> <li>- Excursions are part of the curriculum, linked to other teaching topics</li> <li>- The three important steps:                             <ul style="list-style-type: none"> <li>° Planning and preparation</li> <li>° Implementation</li> <li>° Final assessment (reports, evaluation)</li> </ul> </li> </ul>
Advantages	<ul style="list-style-type: none"> <li>- Appropriate for presentation of facts, problems, new information and theoretical know-how</li> </ul>	<ul style="list-style-type: none"> <li>- Stimulates independence of thinking (if trainees have a certain maturity)</li> </ul>	<ul style="list-style-type: none"> <li>- Good method for real work in daily life</li> <li>- Development of persuasive power</li> </ul>	<ul style="list-style-type: none"> <li>- Learning of interaction patterns and of team work</li> </ul>	<ul style="list-style-type: none"> <li>- High learning effect</li> </ul>	<ul style="list-style-type: none"> <li>- Link to other real work situations</li> </ul>
Disadvantages (or conditions)	<ul style="list-style-type: none"> <li>- Does not stimulate independent thinking and acting</li> <li>- Inappropriate for mediation of practical skills</li> </ul>	<ul style="list-style-type: none"> <li>- Requires highly qualified trainer</li> <li>- Must be combined with formal teaching lessons</li> </ul>	<ul style="list-style-type: none"> <li>- Not suitable for the mediation of comprehensive know-how and data</li> </ul>	<ul style="list-style-type: none"> <li>- Not suitable for the mediation of comprehensive know-how and data</li> </ul>	<ul style="list-style-type: none"> <li>- Method is time consuming. Requires careful preparation and guidance</li> <li>- Not suitable for mediation of complex know-how</li> </ul>	<ul style="list-style-type: none"> <li>- Time consuming</li> <li>- Expensive</li> <li>- Not suitable for mediation of comprehensive know-how</li> </ul>
Main fields of application	<ul style="list-style-type: none"> <li>- Theoretical subjects</li> <li>- Introduction to subjects</li> </ul>	<ul style="list-style-type: none"> <li>- Deepening of knowledge which has been taught earlier</li> </ul>	<ul style="list-style-type: none"> <li>- Planning sessions</li> <li>- Management sessions</li> <li>- Discussion of alternative solutions</li> </ul>	<ul style="list-style-type: none"> <li>- Deepening of knowledge which has been taught earlier</li> </ul>	<ul style="list-style-type: none"> <li>- Indispensable in teaching practical skills</li> </ul>	<ul style="list-style-type: none"> <li>- Useful for most topics</li> </ul>

Table 27: Teaching methods (Form Appendix M. 20)

General rules for teaching/training

Active, participative learning

In the modern educational approach, the trainer acts as a guide to mediate relevant know-how and skills. She or he organises exercises which help the trainees to gain routine.

**Trainees learn very little when they are just listening to a trainer talking.** Writing on a board improves the learning process a little. What is more effective is to give the trainees some task to perform (Figure 42). Invite trainees to ask questions and to apply information in solving problems. Arrange for trainees to practice thinking, talking, explaining ideas and doing practical work. Summarise from time to time what you are teaching. Use resource persons from the village and from outside as much as possible, for capacity building and to strengthen inter-institutional links.

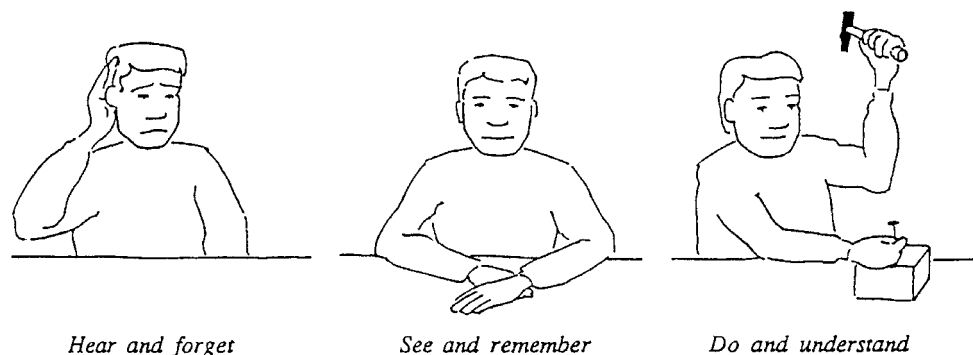


Figure 42: How to maximise the learning effect

**Feedback**

**Trainees need encouragement and advice.** Explain the errors they make and how they could do better. Feedback usually consists of three parts:

- Encouragement for what has been done well
- Objective indication of the overall standard (exams, tests)
- Pointing out any errors and ways of improvement

**Individuality**

Talking to and working with trainees individually is one possible way of responding to individual differences.

- Talk to trainees and find out what their personal interests, ambitions and comments on the training are. Promote a culture of positive, constructive criticism
- Show that you care by detailed preparation of the training and by starting sessions in time. Expect and demand work of a high standard from the trainees
- Allow and encourage trainees to work at different speeds, in different ways
- Let the trainees know that you care that they do well

**Logical framework for HRD-concept**

Table 28 is a simple tool for structuring a training concept and programme in a logical framework. An example is presented in Appendix M (logical framework for village water supply training in Lesotho).

<i>Description</i>	<i>Verifiable indicators</i>	<i>Means of verification</i>	<i>Critical assumptions</i>
Development objectives			
Immediate objectives			
Main outputs			
Activities			
Inputs <ul style="list-style-type: none"> <li>■ Community</li> <li>■ Government</li> <li>■ Donors</li> <li>■ Training institutions</li> <li>■ Participants, students</li> </ul>			

**Table 28:**

**Logical framework for HRD-activities, from GOPP/ZOPP (Form Appendix M. 19)**

**Course and lesson preparation**

Based on the training target and adapted to the characteristics of the trainees and their trainer, the most suitable teaching method or a combination of different methods can be chosen. After the methods have been selected, the courses can be prepared and, in a second step, each session worked out in detail.

**Structuring courses and lessons** makes it easier for trainees to learn and recall a topic. This applies to a course as a whole as well as to the details of each session. The following simple structure is recommended:

- Review of the last session
- Introduction (overview, main aspects)
- Core contents (details, practice)
- Summary

To avoid courses being monotonous, it is advisable to use different teaching methods, e.g. mixing theoretical and practical aspects, demonstrations, site excursions, discussions, and question-answer sessions. In spite of the importance of proper planning, it is also important that a trainer is able to respond to specific situations by improvising.

Table 29 is a checklist for training preparation (after having a clear formulation of teaching topics and objectives).

- 
- Familiarisation with training objectives (needs assessment, expectations of trainees, employers, etc.)
  - Collection of information and relevant literature (teaching aids, source material)
  - Who does the teaching? (outside consultants, local training institutions, qualification of trainers)
  - Description and scheduling of training programmes and lessons (what / when / how / where?)
  - Who are the trainees (background, needs, learning capacity, etc.)
  - Preparation of teaching aids and material including certificates
  - Facilities required (equipment, rooms, etc.)
  - Logistics, accommodation and feeding of trainees and trainers
  - Finances: who pays what?
  - Leisure: possible activities during free time (e.g. sightseeing, picnic, etc.)
  - Other arrangements required
- 

**Table 29:** *Checklist for training preparation*

### **Teaching aids**

#### **Board and flipcharts**

The board is a traditional element of teaching and is still useful and widely used today:

- to present an informative introduction into the topics, to show the structure of the session, etc.
- as a supporting instrument to note down key words, important aspects, difficult expressions, formulas, etc.
- as a medium for drawings which are not too complicated

The information on the board should, whenever possible, be written or drawn in front of the trainees and during the session. The main advantage of the board is that the information can be written step-by-step and in relation to the teaching, and trainees' remarks can be integrated. While talking to the trainees, the trainer should face them and not the board. Writing and drawings should be accurate, without mistakes, structured clearly and easily legible to all the trainees. The board information is the basis for trainees' notes.

**Overhead projection**

Where the required equipment and electricity is available, overhead projection can be a valuable visual aid. It combines the advantages of the board with the possibility of preparing material in advance, e.g. writing the text properly, or copying excerpts, drawings and diagrams from manuals and other sources. During the session it is possible to complement the prepared presentation with writing. Compared to the board, however, less information is visible at any one time. A general danger is that there may be too much text, in too small a font, on the presentation.

**Hand-outs, manuals**

Handouts are written papers distributed to the trainees before or during a session. They may be short notes which form the main points of a lecture, sets of questions which trainees are asked to answer, or leaflets or manuals with drawings, pictures and text (as much as necessary, as little as possible). Handouts can help trainees to learn more easily and the need to take notes from the board can be reduced. They can also be used later in practical work.

The following questions may help in developing the hand-outs and manuals:

- Is the material needed? No other suitable material exists? What form is most attractive?
- How, by whom and under what conditions will the material be used (as training material, as reference material)?
- What reading and understanding ability (texts, diagrams) do the users have?

**Slides, videos, films**

These media can present a very realistic picture of the topics and can provide a welcome change in the training pattern. A danger is that they can be used exclusively and for too long a time, making a session monotonous. It is advisable to use them in short sequences showing clearly defined and specific topics and to alternate them with other teaching methods.

Compared to videos and films, slide shows have the advantage that the time frame is not rigidly fixed. This allows explanations and short discussions on and between slides.

**Characteristics of visualisation**

- **Visualisation is an irreplaceable component of the moderation technique (6.3).** We have five senses with which to perceive, and yet most group communication processes make use of only one channel: the ear. However, concentration and attention levels are raised considerably by simultaneous visual and oral presentation.
- Presentation of several pictures/aspects simultaneously (complicated network-scenarios)
- Visualisation forces the presenter to choose between significant and insignificant information
- Statements, controversies and results are made visible to all and recorded immediately.
- Furthermore it helps the participants to identify with the result: everyone can see their own contribution and the way the result emerged.
- Visualisation for group work means the charts must be prepared in such a way that a group can work with them: the chart can consist of questions, grids, memories, scenarios or information. Examples of charts which can be used often are shown in Figure 43.

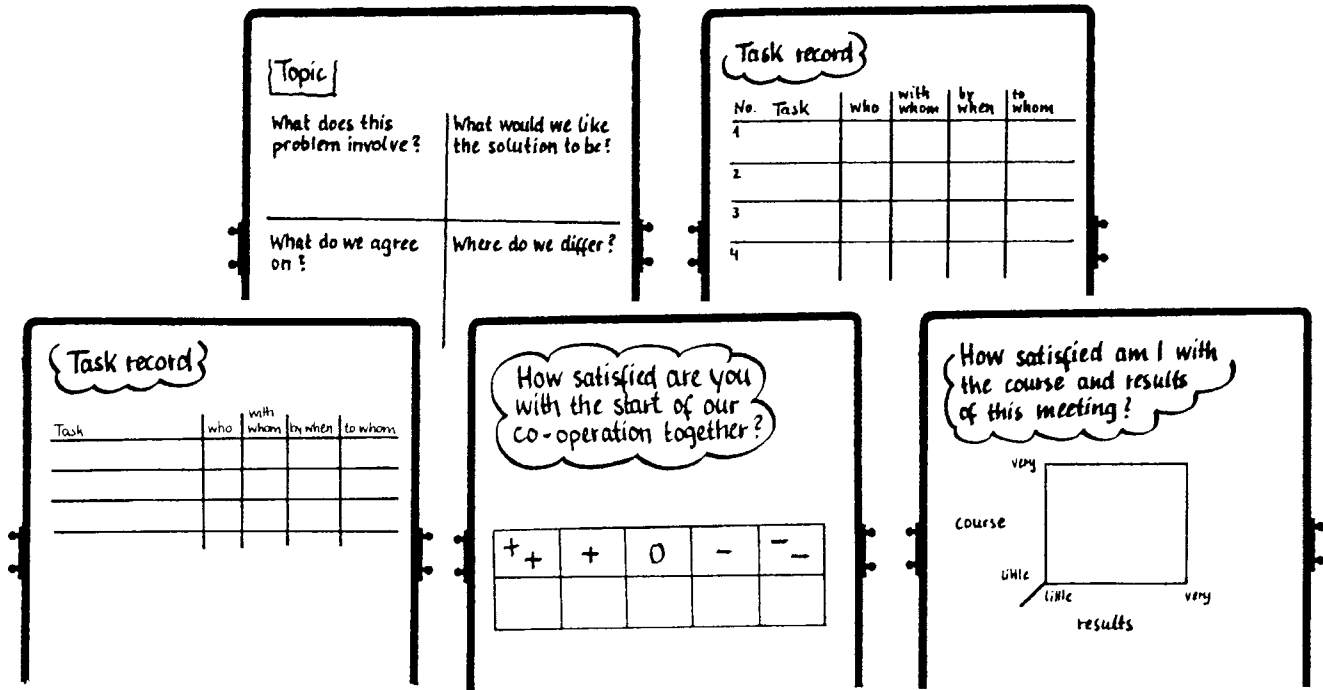


Figure 43: Examples of charts [26]

- The handwriting on charts and on cards must be clear, with a good marker. The script size for cards should be about 2.5 cm high, that for headings about 5 cm high. In group work such script should be readable up to a distance of about 6 to 8 m.

■ Elements of visualisation:



- cards in different colours, 10 x 21 cm (1/3 A4-size) to write down text and comments. Cards can be stuck on the charts.



- discs, oval cards to emphasise statements, for conclusions, etc.



- differently coloured adhesive dots for grouping, evaluation, rating procedures.



- arrows to mark conflicting statements.

**PRA-method**

The PRA method ([Appendix F.1](#)) and other tools presented in Section 3 and 4 are helpful in planning and structuring processes and facilitating progress in systematic and continued learning.

**Informal methods**

In many cases and circumstances, learning is very specific. Groups and individuals face a great variety of opportunities to have experiences and to learn from each other through exchange. Individual learning too is highly effective when it is done efficiently and continuously. Books, home courses, individual working documentation, etc. are useful tools.

**Follow-up**

**Training without adequate follow-up has little chance to be effective.** Frequent staff meetings are occasions where staff and committee members talk about their work, ask questions and get answers from others, professionals or laypersons. Such meetings can boost the morale of discouraged workers and reinforce the lessons discussed in training. As trainers know, it is the follow-up that provides the real educational growth. **When theoretical learning is taken to the field for application, then brought back to be questioned, shared and discussed with peers and superiors, it is transformed into understanding and well-rooted knowledge.** Feedback allows improvement of further courses. Optimal follow-up needs to be planned. Refresher courses can be regarded as an important form of follow-up.

Formally trained project committees can be effectively followed up by interactive participatory workshops, by site visits allowing exchange of experiences, by community meetings, etc. Project managers must realise that the consolidation of a new community management system requires a follow up of about three to five years after project completion.

## 6.5 **Practical hints / Checklist for HRD and ID**

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- Discussion of proposed training programme and concept with the participants
- Consideration of the existing knowledge and experience of the participants
- Application of clear, simple language (if necessary, local language)
- Planning of exercises and group work, in order to limit lecturing
- Ensure that everyone participates actively in each session
- Encouragement of participants not to use the methods mechanically
- Anticipate potential conflicts and how to deal with them
- Prepare appropriate debriefing questions for each session
- Allow sufficient time in the programme for feedback
- Ensure appropriate evaluation of training

## 7. ECONOMIC RESOURCE MANAGEMENT

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### 7.1 Introduction

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Economic and non-economic resources must be managed in an integrated manner. This chapter deals with the question of how to acquire and allocate project finance. The handling of large sums of money, and financial management in general, may be new tasks for many communities. Therefore, optimal information, transparency and proper handling are necessary.

***For all public money (and material), whether it comes from the community, from the government or external donors, professional management including proper book keeping and auditing are indispensable.***

The South African MVULA Trust approach proves how the delegation of power for financial management to the communities has a remarkable empowering effect. However, the external partners/donors must maintain a certain degree of control.

This chapter concentrates on basic considerations and methods, while applied financial management is discussed under [B 4.4](#).

### 7.2 Willingness and ability to pay

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#### ***Purpose - Scope***

#### ***Assessment of willingness and ability to pay***

'Willingness To Pay' (WTP) and 'Ability To Pay' (ATP) are key terms for sustainability and are defined in [A 3.4](#). Relevant surveys operate with a series of structural questions to determine the amount of money a household is willing/able to pay for goods or services. Methodological alternatives range from simple interviews, numerous appraisal methods to more traditional studies. However, WTP studies have limited value.

#### ***WTP and ATP are susceptible to change***

The preparedness and the decision to pay for a service is at each level linked through complex mechanisms to the ability to pay. Both willingness and ability to pay are affected by external and internal factors that are susceptible to change.

WTP and ATP relate to all project partners: community, government and donors. And WTP/ATP for investment and operation should be defined for and by each stakeholder category in the early stages of project planning.

WTP/ATP of local users cannot be measured exactly. Rough estimates may be made from observing the local and regional economy and from assessing individual households. Close observation and general discussion of household economic behaviour may contribute to a fuller picture of the real situation. The real interest in water and the priority given by the people themselves are decisive factors for water system and for water price considerations.

Peoples' awareness about the relationship between water/sanitation/health and water economy is a precondition for the preparedness to contribute financially or in kind. Therefore good background information on socio-economic characteristics and water/sanitation will be a precondition for WTP assessment.



**Key objectives**

Through community-based, participative WTP/ATP surveys, promotion/achievement of:

- **Financial sustainability of water and sanitation projects** and programmes (minimising the risks of failure) through effective and economic use of available funds
- Based on a pre-evaluation of alternatives (including the existing situation): **identification of real demand**, preferences of the users
- **Understanding that water and sanitation service cannot be free** (anymore). Awareness creation about cost-benefit relations. Stimulation of community's willingness to pay a substantial amount for investment costs and almost the full amount of operation & maintenance costs
- Finding out the importance and priorities of socio-economic aspects and of policy issues. **Negotiation of appropriate, realistic levels of local participation** (avoidance of under/overloading)
- **Finding out WTP for the different project alternatives** (service levels), including the zero option, an improvement of the situation and other low cost options. Results of WTP studies should facilitate appropriate joint decisions by users, government and donors
- **Finding out the credit-giving capacity/potential and the reputation of the local private sector**

**Tools for WTP/ATP assessment**

There are a number of tools used to assess the willingness to pay:

- **A general assumption** on the part of the programme designers that people will and can pay. This is often based on a false confidence of 'knowing the people'. This non-user-based approach is being overtaken currently by more logical methods.
- Using **broad generalisations**, for example, that a family with a specific income should spend X percent of its income on water and sanitation. This is not really an indicator of willingness to pay and the danger is that people are not told the real costs but only what is demanded as a contribution. This can result in choices that are not sustainable.
- **Questionnaires, limiting the choice to pre-selected alternatives** that may or may not be realistic. These may be improved upon by using open questions and not relying only on closed and multiple-choice questions.
- **Community participatory approaches** that are a mix of community involvement, promotion and information gathering. These can give indicators as to whether the community wants to and is able to participate and contribute in both cash and kind.

**Steps of a WTP/ATP study**

A WTP/ATP survey is a process that needs preparation and planning. **Such a survey is part of the assessment of the local context** (B 3.2)

- Forming a well-qualified **focus group** (with government participation, if possible)
- Formulation of **goals and objectives** of the study
- Calculation of **time and required means (budget)** for the study
- Working out of a **handy questionnaire** (adapted to the local conditions: sociology, technology, economy, policy, language, etc.). Pre-testing and adaptation by the focus group
- **Careful selection, training and testing of enumerators and supervisors**
- **Implementation of main survey:** interviews with a representative segment of the population
- **Data analysis (evaluation), conditioning and presentation**
- **Decision making process** / translation of results and recommendations

## Questionnaire and interviews

A good questionnaire can help to clarify the expectations, needs and capacities of individuals and groups of users. The questionnaire must relate to the specific geographical, socio-economic and cultural situation of a village or region. A combination with the general 'assessment of the local context' (B 3.2) is advisable.

### *The different categories of questions:*

- Basic questions: situation and priorities in the related socio-economic fields of employment, income, living conditions, costs, training and knowledge, health, etc.
- Questions relating to water and sanitation
- Specific WTP/ATP questions.

Through the introduction and explanation of various project alternatives, and their financial implications through visualisation of options regarding water and sanitation projects, the willingness and ability to pay should become assessable.

### *Checklist for the creation of a questionnaire (for WTP/ATP assessment):*

- **General identification** (number of questionnaire and of each individual question, date, name of respondent and of interviewer, location, territorial administration unit, etc.)
- **Introduction/explanation** (declaration to be read in detail, explanation of objectives and fields of interest)
- **Actual water and sanitation situation** (analysis in co-ordination with the assessment of the local context (B 3.2):
  - User inputs for maintenance (labour, finances, others, who in the family contributes?)
  - payment models and financial administration
  - economic importance of water
- **Technical options** (including actual situation and zero option)
  - Introduction of different solutions and supply standards (B 3.6)
  - Financial implications and expected contribution for investment and O+M
- **WTP for water and sanitation services** (different options):
  - How much is the family (the quarter, the village) prepared to pay or to work for the investment phase?
  - What is the degree of WTP for the water itself (for O+M)?
  - Amount per family and period
  - Economic priorities and rating of different water and sanitation alternatives and other development projects
- **Economic capacity and potential of families (ATP):**
  - Income of family members (separately)
  - Family expenditure during previous years.

## Practical and methodical hints

### *Preparation of the assessment*

- Building up a study team (director, research assistant(s), field supervisor(s), team of enumerators); Enumerators, a mix of male and female, must be respected persons, familiar with the local communities, economy and culture (local school teachers, secondary school graduates, government employees, etc.)
- Working out of programme and schedule (activities, objectives, timetable)

- Resource requirements (personnel, working periods, vehicles, travel, accommodation, office equipment, paper, publications, etc.). Cost estimation.

**Introduction to the local community**

Before the enumerator asks the WTP questions, the respondent(s) must clearly understand both the water service that is being discussed and the terms under which it could be provided. The enumerators read a defined opening statement or preface to the WTP questions, which describes the institutional arrangement and the system of charging for water. Because the amount a household is willing to pay may well depend upon such factors, it is extremely important for the enumerator to communicate exactly what is being proposed.

**Question formats**

- Each WTP question must concentrate on one option only (no accumulation).
- The problem of **open questions**, for example: ‘What is the maximum you would be willing to pay for ...?’ Such questions are difficult to understand. And people may give wrong answers, because they try to meet the enumerator’s expectation.
- **Yes/no questions** with clearly specified choices proved to work better. Typically the enumerator would ask two or three such yes/no questions, each time changing the price. Such a sequence of questions is termed the **bidding game** (Figure 44). They can help to identify realistic tariff categories (intervals into which the true WTP falls).
- **Ask simple questions** (a substantial part of the population may be illiterate). An example: to ask about the education level of members of the household may initiate long and confusing discussions. A simple question whether the head of a household can read a newspaper easily, with difficulty or not at all may subdivide the sample just as effectively and with less potential confusion about grade level and type of schools.

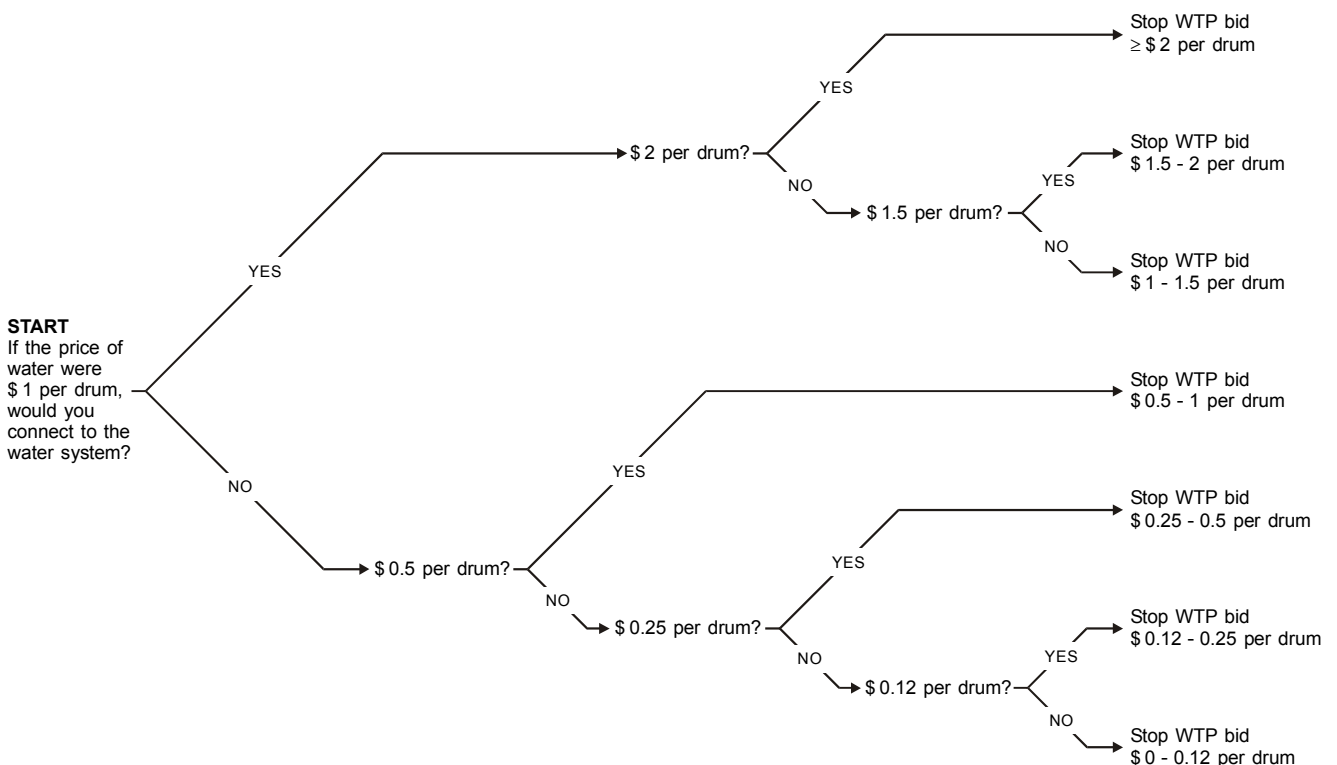


Figure 44: Flow chart of willingness to pay - bidding game

### ***Testing for biases***

For a variety of reasons, respondents may not provide reliable answers to the questions. Strategic bias may occur when the respondent believes he or she can influence a decision or plan by not answering the questions honestly. Other (hypothetical) biases may occur for several reasons: the respondent may not understand exactly the exercise or may not bother to think seriously about the questions because he or she believes the answers will not actually influence the outcome of a decision or planning process.

To the extent that it is possible, the questionnaire should be designed to test for biases (for greater confidence). The reliability of responses can be tested by introducing the following modification to the WTP/ATP questionnaire: if respondents are uncertain about their own valuation of the improved water system, or want to please the enumerators, they may be influenced by the first price used in the WTP questionnaire because they may believe this is a 'reasonable' answer. One way to test whether the initial price in the bidding game influences the respondent's final bid is to administer different versions of the questionnaire to different randomly selected subsets of the sample. Therefore in one version the bidding game should start with a high price and the bidding would move down; in another version the bidding game would start with a low price and the bidding would move up. The analyst would then test to see whether the final bids of the two sub-samples were statistically different.

The questionnaire can sometimes be designed to minimise strategic bias by attempting to convince the respondent in the opening statement that his or her best strategy is to answer the WTP questions honestly. Interviews must be combined with observations (the answer spaces should have room for relevant remarks).

### ***Compilation of data and analysis of investigations***

- tabular/graphical presentation of WTP/ATP results
- Interpretation of the results
- Evaluation/analysis/discussion of results with stakeholders
- Conclusions and recommendations (for feasibility study see [B 3.6](#) and for decision-making [C 1](#))

### ***Limitation of WTP/ATP studies***

- They give indicators only, they are open to methodological errors; bidding is complex and should be crosschecked.
- They are vulnerable to manipulation by government, communities, researchers, donors, etc.
- Usually the local solution (home made, simple) has no status and may even seem unacceptable to officials or to some decision-makers.
- Hidden agendas and motivations can influence the study.
- Danger that unsuitable or excessively expensive assessment methods will be used
- Willingness and ability to pay are not constant; their dynamic development should not be underestimated.
- Questions and questionnaires tend to be too long (how much time are respondents willing to spend in the interview process?)
- Using pictures of technology with verbal explanation to an illiterate audience could cause problems as generally illiterate people may interpret pictures differently. A picture test is therefore essential.

### 7.3 Water pricing and tariff models

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#### Purpose

**Cost benefit relations must be discussed with, understood by and decided with the population in the early stages of a project planning process.** Economic conditions are described in A 3.4.

The price of a good or a commodity can only be judged in relation to the benefits. Prices and benefits include financial and non-monetary, positive and negative components. The price of a water supply depends highly on the service level required. Costs and benefits and their ratio determine to a great deal the achievement of sustainability.

**The specific investment and operation costs (per head) are very much influenced by factors such as:**

- Service level (allocation of taps)
- Population density within the supply area; distances between quarters and taps
- Specific water consumption per person (10 - 150 l/day)
- Additional water consumption for income generation: animals, plant watering, industrial production, etc.
- Distance between source and supply area (200 m - 10 km)
- Water treatment (condition of untreated water, quality requirements)
- Water yield (if it is very high, a reservoir might not be necessary)
- Water lifting requirements (energy)
- etc.

#### Cost Recovery

Depending on the above factors the amount of **cash investment per head for a rural water supply (consumption unit of 30 l/day) can vary between about US\$ 10 and 50** and in extreme cases exceed even US\$ 100 and more.

**The operational costs too depend mostly on the complexity of a system.** A well-constructed community-managed small gravity scheme can be operated for about **US\$ 1 to 2 cash per person per year**, caretakers' compensation included. For a more complex system with some full-time staff, raw water treatment and pumping, water metering etc. the specific cash costs per year might be five to ten times as high or more.

If possible, **replacement provisions should be included in the cost calculation.** This causes water rates to increase considerably. Assuming a medium life-span for pipelines and concrete structures of 30 to 35 years, **3 % of the initial investment should be deposited yearly** (if the interest rate is able to compensate for inflation). For example, in a simple gravity system, where the initial investment works out at US\$ 50 per head of population, an amount of US\$ 1.50 (i.e., 3 % of US\$ 50) per head per year should be saved to cover replacement costs. This doubles the annual cost of water for each individual.

#### Tariff options

Annex N is a summary presentation of tariffs out of the comprehensive study 'What price water?' [23]. Specific conditions, advantages and weak points of the options are shown in the same table.

### Higher price for yard and house taps

In rural areas a basic supply system consists of properly distributed public stand-pipes, water points for the schools, welfare centres, etc. Yard and house taps represent an important next step in the improvement of living conditions. *The daily consumption practically doubles with the change from public stand posts (20 - 30 l/person) to private yard connections (approx. 40 - 70 l/person.).* If natural resources allow, the distribution networks should be planned so as to enable future upgrading including private connections. Before starting the promotion of private connections, strict rules and a realistic tariff policy must be established. Corresponding to the greater convenience and higher consumption, private connection holders should contribute more to the investment and running cost of the water supply system. It has been observed that in systems with private connections the reliability of the supply improves significantly. The reason behind this is improved management because of a greater demand/pressure for constant supply.

Despite the critical remarks in Annex N, *the consumption of private house connections should be measured with water meters and billed accordingly* as soon as distribution to this consumer category exceeds 20 - 30 % of the total water production. A promising new meter system with rechargeable taxcards (chips) is being tested in pilot projects. High costs and initial weaknesses must be overcome before such technologies can be recommended.

### Credits

Basic considerations of credits and deposits are given in A 3.4. Table 30 indicates the real costs of credits.

Credit variant	Initial loan financial units	Annual interest to pay	Repayment within y years (periods)				
			y = 2	y = 5	y = 10	y = 20	
I	100 U	5% = 5 U	A	107 U	115 U	127 U	152 U
			B	110 U	125 U	150 U	200
			C	110 U	128 U	163 U	265 U
II	100 U	10% = 10 U	A	115	130	155	205
			B	120	150	200	300
			C	121	161	259	672
III	100 U	15% = 15 U	A	122	145	182	257
			B	130	175	250	400
			C	132	201	405	1'637
<p>A) Repayment in equal yearly instalments, + interest ( gradual amortisation)</p> <p>B) No amortisation; yearly payment of interest only, full loan repayment after the period</p> <p>C) Repayment of the full credit and of the accumulated interest debts after the period</p>							

Table 30:

*The real costs of credits*

## **TABLE OF CONTENTS APPENDICES**

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<b>A</b>	<b>BIBLIOGRAPHY</b> .....	<b>163</b>
<b>B</b>	<b>ABBREVIATIONS</b> .....	<b>173</b>
<b>C</b>	<b>INTERNATIONAL NETWORK FOR WATER AND SANITATION</b> .....	<b>174</b>
<b>D</b>	<b>APPROPRIATE TECHNOLOGY CHECKLIST</b> .....	<b>177</b>
<b>E</b>	<b>WATER AND SANITATION KNOWLEDGE SYSTEM (WSKS)</b> .....	<b>179</b>
<b>F</b>	<b>PLANNING TOOLS - "COOPERATION PLANNING" [31]</b> .....	<b>183</b>
	1. Participatory rural appraisal (PRA) .....	186
	2. Successes - weaknesses - potentials - obstacles (SWPO) .....	188
	3. Goal oriented project planning (GOPP / ZOPP) .....	190
<b>G</b>	<b>IMPLEMENTATION TOOLS [31]</b> .....	<b>193</b>
	1. Operational plan .....	194
	2. Operational management .....	195
	3. Task charts .....	196
	4. Bar charts .....	197
	5. Flow charts .....	198
	6. Brainstorming .....	199
<b>H</b>	<b>GOVERNMENT ENGAGEMENT IN VILLAGE WATER SUPPLY - LESOTHO</b> .....	<b>200</b>
<b>I</b>	<b>WHITE PAPER ON A NATIONAL WATER POLICY FOR SOUTH AFRICA [34]</b> .....	<b>201</b>
<b>K</b>	<b>PROJECT AGREEMENT (Example of Community Development Programme, Cameroon)</b> .....	<b>206</b>
<b>L</b>	<b>SOCIO - ECONOMIC QUESTIONNAIRE (Assessment of local context)</b> .....	<b>210</b>
<b>M</b>	<b>FORMS</b> .....	<b>213</b>
<b>N</b>	<b>SUMMARY TABLE OF TARIFF OPTIONS [27]</b> .....	<b>234</b>





# Appendices

## APPENDIX A

## BIBLIOGRAPHY

This short bibliography (see below) is periodically updated and its paper version can be requested from SKAT. It also exists as a html file on the SKAT homepage under [http://www.skat.ch/ws/publ/online/20books/20books\\_2001.htm](http://www.skat.ch/ws/publ/online/20books/20books_2001.htm), and as a downloadable pdf-file under [http://www.skat.ch/ws/publ/download/20\\_Books\\_on\\_DWS\\_2001.pdf](http://www.skat.ch/ws/publ/download/20_Books_on_DWS_2001.pdf).

### *Drinking Water Supply, Sanitation and Wastewater 20 Basic Books*

for planning and executing technicians and engineers (updated January 2001)

This document contains a brief list of relevant books for Water Supply, Sanitation and Wastewater. The books have been selected according to the following categories:

1. General Literature on Water Supply and Sanitation
2. Health, Hygiene Behaviour, Education and Promotion of Sanitation
3. Water Supply and Treatment Technologies
4. Sanitation and Wastewater Technologies
5. Emergency Water Engineering
6. Operation and maintenance

We have added to this list two interesting publications in French.

The potential user should keep in mind that the books included in this list give an overview/introduction of the various subjects/topics.

This list has been elaborated by SKAT in collaboration with EAWAG/SANDEC (Swiss Federal Institute for Environmental Science and Technology/Department for Water and Sanitation in Developing Countries). Inputs were also received from various other sector specialists in the water supply and sanitation sector.

The list is being regularly revised and updated. SKAT is therefore interested in receiving your comments and suggestions for new books.

Most of the books can be ordered from:

ITDG Publishing  
103-105 Southampton Row  
London WC1B 4HL, UK  
Tel: +44 20 7436 9761  
Fax: +44 20 7436 2013,  
e-mail: [orders@itpubs.org.uk](mailto:orders@itpubs.org.uk)  
URL: <http://www.oneworld.org/itdg/publications.html>

For specific problems and questions, the potential user of the books is advised to contact SKAT for detailed assistance:

SKAT  
Swiss Centre for Development Cooperation in Technology and Management  
Vadianstrasse 42  
CH-9000 St. Gallen  
Switzerland  
Phone: + 41 71 228 54 54  
Fax: +41 71 228 54 55  
e-mail: [info@skat.ch](mailto:info@skat.ch)  
URL: <http://www.skat.ch>

## 1. *General Literature on Water Supply and Sanitation*

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### ① *Guidance Manual on Water Supply and Sanitation Programmes*

---

author: Batteson Helen, Davey Kay, Shaw Rod 300/100664  
 year: 1998 pages: 338pp  
 language: english isbn: 0 906055 58 X  
 publisher: WEDC, Loughborough, UK

abstract: The primary purpose of this outstanding manual is to set out principles, procedures, and practices that should guide decisions on the choice, design, and management of appropriate WS&S projects. Because the effectiveness and sustainability of such projects do not only depend on technology choice, but also, critically, on user involvement, the right gender approach, innovative community based financing, and the promotion of behavioural change, the guidance includes discussion of social, financial, and institutional aspects as well as engineering and health concerns.

keywords: water supply, sanitation, technology, social aspects, health aspects, environmental aspects, financial aspects, institutional issues, project preparation, project management, project evaluation

## 2. *Health, Hygiene Behaviour, Education and Promotion of Sanitation*

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### ② *Environmental Health Engineering in the Tropics: an Introductory Text (2<sup>nd</sup> ed.)*

---

author: Cairncross S, Feachem R G 361/96111  
 year: 1993 pages: 306pp  
 language: english isbn: 0 471 93885 8  
 publisher: John Wiley & Sons Ltd., Baffins Lane, Chichester, West Sussex PO19 1UD, UK

abstract: This book describes the infectious diseases in tropical and developing countries and the measures that may be used effectively against them. The second edition includes information on composting, the safe re-use of wastes, and low-cost sewerage, as well as policy and the strategies for implementing water and sanitation programmes.

keywords: environmental health, sanitation, water quality, infectious disease, water supply, water treatment, latrine, wastewater treatment, drainage, waste collection, waste disposal, composting, health aspects

---

### ③ *Guidelines For Drinking-Water Quality Vol.1: Recommendations (2<sup>nd</sup> ed.)*

---

author: - 350/1050/E1  
 year: 1993 pages: 180pp  
 language: english isbn: 92 4 154460 0  
 publisher: WHO, 1211 Geneva 27, Switzerland

abstract: This volume contains the guideline values themselves, together with an explanation of how they should be used, the criteria used in selecting the various contaminants considered, a description of the approaches used to derive the guideline values.

keywords: drinking water, guidelines, parasitic disease, water quality, water treatment

- 
- ④ ***Vol.2: Health Criteria and Other Supporting Information (2<sup>nd</sup> ed.)***
- author: - 350/1050/E2  
year: 1996 pages: 973pp  
language: english isbn: 92 4 154480 5
- abstract: This volume explains how guideline values for drinking-water contaminants are to be used, defines the criteria used to select the various chemical, physical microbiological, and radiological contaminants included in the report.
- keywords: health aspects, parasitic disease, infectious disease, water quality, water supply, water treatment
- 
- ⑤ ***Vol.3: Drinking Water Surveillance and Control of Community Supplies (2<sup>nd</sup> ed.)***
- author: - 350/1050/E3  
year: 1997 pages: 238pp  
language: english isbn: 92 4 154170 9
- abstract: This volume describes the methods used in the surveillance of drinking-water quality in the light of the special problems of small-community supplies, particularly in developing countries, and outlines the strategies necessary to ensure that surveillance is effective.
- keywords: drinking water, education, hygiene, spring, survey, water, water analysis, water quality, water supply, water testing, treatment, well
- 
- ⑥ ***Together for Water and Sanitation - Tools to Apply a Gender Approach: the Asian Experience***
- author: Bolt E (Ed.) 300/95098  
year: 1994 pages: 107pp  
language: english isbn:   
series: Occasional Paper 24  
publisher: IRC, PO Box 2869, NL-2601 CW Delft, Netherlands
- abstract: Part I of this manual gives a theoretic framework about women's involvement and applying a gender approach. Part II provides tools to apply a gender approach based on consolidated field experience for the various phases of a project.
- keywords: gender, water supply, sanitation, women in development, project management
- 
- ⑦ ***Studying Hygiene Behaviour: Methods, Issues and Experiences***
- author: Cairncross S., Kochar V. (ed.) 820/95021  
year: 1994 pages: 334pp  
language: english isbn: 81 7036 387 X  
publisher: Sage Publications India PV Ltd., 32 M-Block Market, Greater Kailash-I, New Delhi 110 048, India
- abstract: This book deals with general theoretical and empirical issues relating to research methods for studying hygiene behaviour, educational interventions to change hygiene behaviour, and the responses of communities to such programmes.
- keywords: hygiene, education, research, case study

---

⑧ ***Sanitation Promotion - WSSCC Working Group on Promotion of Sanitation***

---

- author: Simpson-Hébert Mayling, Wood Sara 360/100107  
 year: 1998 pages: 277pp  
 language: english isbn: -  
 publisher: WHO, 1211 Geneva 27, Switzerland
- abstract: This publication includes articles on new ways of approaching sanitation issues, guidance articles, checklists to guide the planning of particular programme elements, worksheets, lists of guiding principles, and lists of the features that characterize better programmes.
- keywords: guidelines, health aspects, hygiene, latrine, project management, project preparation, sanitation, wastewater treatment

### 3. ***Water Supply and Treatment Technologies***

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⑨ ***Hand-dug Shallow Wells***

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- author: Collins Seamus 321/101222  
 year: 2000 pages: 92pp  
 language: english isbn: 3 908001 97 8  
 series: Manuals on Drinking Water Supply Vol. 5  
 publisher: SKAT, Vadianstrasse 42, CH-9000 St. Gallen, Switzerland
- abstract: This manual deals with the planning, construction, management, operation and maintenance of hand-dug wells for water supply to communities in the South. It is intended to be used by planners, engineers and technicians in the water sector, with the aim of facilitating the decision on the type of technology to use in a given situation and, where relevant, to outline the implementation of that technology.
- keywords: water supply, construction, well, hand-dug well, management, operation and maintenance, planning, community

---

⑩ ***A Handbook of Gravity-Flow Water Systems for Small Communities***

---

- author: Jordan Th D 341/0517  
 year: 1984 pages: 224pp  
 language: english isbn: 0 946688 50 8  
 publisher: ITDG Publishing, 103-105 Southampton Row, London WC1B 4HL, UK
- abstract: Originally written for the construction of gravity-flow drinking water systems in Nepal, this is equally applicable for other locations around the world. Organized for quick reference, it is quickly and easily understood.
- keywords: water supply, hydraulics, hydraulic ram, intake, construction, nepal

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⑪ ***Water Lifting***

---

- author: Baumann Erich 330/101247  
 year: 2001 pages: 78pp  
 language: english isbn: 3 908001 99 4  
 series: Manuals on Drinking Water Supply Vol. 7  
 publisher: SKAT, Vadianstrasse 42, CH-9000 St. Gallen, Switzerland
- abstract: Demand Responsive Approaches give the village communities the power to choose which type of technology they want for their water supply facilities. They are also responsible for the management of the systems and have to take into consideration costs for operation, maintenance and major repairs as well as the reliability. To arrive at a sensible choice it is necessary that the communities are aware of the technical, financial and institutional implications of their technology choice. This book gives information on the differ-

ent technology options for pumping water (point sources or piped systems) in an easy-to-read format. It lists possible managerial models for provision of services and O&M through the private sector. Technical fact sheets catalogue the most common handpumps used in rural water.

keywords: water supply, water lifting, water pump, handpump, technology, community participation, technology, operation and maintenance, private sector participation, case study, india

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⑫ ***Rainwater Catchment Systems for Domestic Supply***

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author: Gould John, Nissen-Petersen Erik 311/101085  
 year: 1999 pages: 335pp  
 language: english isbn: 1 85339 456 4  
 publisher: ITDG Publishing, 103-105 Southampton Row, London WC1B 4HL, UK  
 abstract: This book provides a state-of-the-art review of practice in the collection of rainwater. It presents case studies with numerous examples from around the world which will help anyone intending to design or construct a rainwater catchment system.

keywords: water supply, rainwater harvesting, design, project management, case study, australia, botswana, china, germany, japan, kenya, new zealand, thailand, unites states

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⑬ ***Surface Water Treatment by Roughing Filters: a Design, Construction and Operation Manual***

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author: Wegelin M 353/97010/E/F  
 year: 1996 pages: 167pp  
 language: english and Spanish (exists also in French) isbn: 3 908001 67 6  
 series: Sandec Report No. 2/96  
 publisher: SKAT, Vadianstrasse 42, 9000 St. Gallen, Switzerland

abstract: This publication presents the concept, design and field experience of roughing filters applied as pretreatment prior to slow sandfilters. It describes treatment processes that convert turbid surface water into safe drinking water.

keywords: water supply, water treatment, slow sand filtration, water filtration

---

⑭ ***Multi-stage Filtration: an Innovative Water Treatment Technology***

---

author: Galvis Gerardo, Latorre Jorge, Visscher Jan Teun 353.50/101725  
 year: 1998 pages: 165pp  
 language: english isbn: 90 6687 028 1  
 series: Technical Paper Series 34-E  
 publisher: IRC, PO Box 2869, NL-2601 CW Delft, Netherlands

abstract: This book introduces multi-stage filtration as a sustainable technology that is in harmony with local conditions and available management capacity of most communities. The community can operate and maintain the system with a minimum of external support at an affordable cost to the users. It is a combination of coarse gravel pre-filtration and slow sand filtration (SSF) and can treat water with levels of contamination well above the levels than can be treated by SSF alone.

keywords: water treatment, water filtration, slow sand filtration, roughing filtration, water quality, design, financial aspects, community participation

#### 4. Sanitation and Wastewater Technologies

---

##### ⑮ *Low-Cost Urban Sanitation*

---

author: Mara Duncan 360/97044  
 year: 1996 pages: 223pp  
 language: english isbn: 0 471 96163 9  
 publisher: John Wiley & Sons Ltd., Baffins Lane, Chichester,  
 West Sussex PO19 1UD, UK

abstract: This book covers the public health, technical, socioeconomic, sociocultural and institutional aspects of sanitation in towns in developing countries. The sanitation technologies covered are VIP latrines, pour-flush toilets, septic tanks, settled sewerage.

keywords: latrine, parasitic disease, pour flush toilet, sanitation, septic tank system, sewage collection, sewage disposal, sewerage system, urban region, vip latrine

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##### ⑯ *Low-Cost Sewerage*

---

author: Mara Duncan (ed.) 361.14/97209  
 year: 1996 pages: 225pp  
 language: english isbn: 0 471 966916  
 publisher: John Wiley & Sons Ltd., Baffins Lane, Chichester,  
 West Sussex PO19 1UD, UK

abstract: This book which is the result of contributions to the International Conference on Low-cost Sewerage in England in July 1995 describes low-cost sewerage technologies and their applications in both developed and developing countries.

keywords: low-cost, sanitation, sewerage system, latrine, drainage, technology, case study, south asia, ghana, greece, africa, united states, colombia

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##### ⑰ *Design Manual for Waste Stabilization Ponds in India*

---

author: Mara Duncan 361.224/97241  
 year: 1997 pages: 125pp  
 language: english isbn: 0 9519869 1 0  
 publisher: Lagoon Technology International Ltd., Leeds, UK

abstract: This book gives a description of waste stabilization ponds, an appropriate method of wastewater treatment in India. Guidance is given on pond monitoring and evaluation.

keywords: india, south asia, stabilisation pond, wastewater, wastewater treatment

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##### ⑱ *Small and Decentralized Wastewater Management Systems*

---

author: Crites Ron, Tchobanoglous George 361/101246  
 year: 1998 pages: 1084pp  
 language: english isbn: 0 07 289087 8  
 publisher: WCB McGraw-Hill, USA

abstract: Recognizing the need to provide effective wastewater management for small flow systems, the focus of this textbook is on small community treatment plants and decentralized systems, as small as individual home systems. Included is a thorough discussion of the constituents found in wastewater and their fate in the environment; process design considerations including risk assessment; the design of alternative collection systems; a detailed consideration of the basic principles involved in the biological, chemical and physical treatment of wastewater; the design of conventional biological treatment processes as well as lagoons, land and aquatic treatment systems, intermit-

tent and recirculating packed beds, the design of individual onsite systems, the reuse and recycling of treated effluent; and the management of septage and biosolids.

keywords: sanitation, wastewater treatment, wastewater analysis, wastewater reuse, wastewater collection, wastewater disposal, biological treatment, lagoon system, wetland, management

## 5. *Emergency Water Engineering*

- 
- ① ***Engineering in Emergencies: a Practical Guide for Relief Workers***
- author: Davis J., Lambert R. 124/96006  
 year: 1995 pages: 715pp  
 language: english isbn: 1 85339 222 7  
 publisher: ITDG Publishing Ltd., 103-105 Southampton Row, London WC1B 4HL, UK
- abstract: This book treats in depth topics like the provision of water, sanitation, and shelter, needs of refugees, managerial skills, and personal effectiveness.
- keywords: water supply, sanitation, shelter, disaster, refugee, environmental health, infrastructure
- 
- ② ***Managing Water Supply and Sanitation in Emergencies***
- author: Adams John 300/100939  
 year: 1995 pages: 190pp  
 language: english isbn: 0 85598 378 7  
 series: Skills and Practice  
 publisher: Oxfam, 274 Banbury Road, Oxford OX2 7DZ, United Kingdom
- abstract: This book is based on a public-health approach to the provision of water and sanitation in emergencies, i.e. information-based (drawing on reliable, relevant data) and people based (aiming for maximum impact on the health of the whole population).
- keywords: emergency aid, water supply, sanitation, solid waste disposal, excreta disposal, hygiene education, drainage, site selection
- 
- ③ ***Out in the Cold – Emergency Water Supply and Sanitation for Cold Regions***
- author: Buttle Mark, Smith Michael 300/100771  
 year: 1999 pages: 99pp  
 language: english isbn: 0 906005 62 8  
 publisher: WEDC, Loughborough University, Leicestershire LE11 3TU, United Kingdom
- abstract: Current events in the Balkans, and events in Bosnia, the former Soviet Union countries, Afghanistan and Northern Iraq throughout the 1990s, demonstrate that humanitarian disasters are not limited to “the South”, Africa, or the Tropics, but may strike anywhere in the world. Relief agencies have been tested in ways previously unimaginable. Aid workers have to be even more adaptable in order to provide life-saving water supplies and sanitation facilities in areas where freezing conditions occur.
- keywords: emergency aid, water supply, water distribution, water storage, water treatment, sanitation, solid waste disposal, excreta disposal, wastewater treatment, sewerage, health, infrastructure, construction

## 6. Operation and Maintenance

### ②② *Linking Technology Choice with Operation and Maintenance*

author: Brikké François, Bredero Maarten, de Veer Tom, Smet Jo 300/100075  
 year: 1997 pages: 166pp  
 language: english isbn: 0 906005 62 8  
 series: Resource Training Package  
 publisher: WHO, Geneva, Switzerland

abstract: This guidance manual is designed to help planners and project staff in the selection of rural and low-income water supply and sanitation technologies. It is divided into two main parts: Part I: Operation and maintenance and technology choice, Part II: Fact sheets on water supply and sanitation technologies.

keywords: water supply, sanitation, technology, operation and maintenance, low-cost

### *Additional Publications (in French) - Publications en français*

#### ②③ *Promotion de l'hygiène du milieu - une stratégie participative*

auteur: Ousseynou Guène, Touré Cheikh S., Maystre Lucien Yves 300/100587  
 année: 1999 pages: 192pp  
 langue: français isbn: 2 88074 390 7  
 série: Collection Gérer l'environnement 17  
 éditeur: Presses polytechniques et universitaires romandes, Lausanne, Suisse

résumé: Ce livre offre une introduction aux diverses démarches participatives permettant d'impliquer la population dans la planification, la mise en oeuvre et l'évaluation de mesures visant à promouvoir l'hygiène de l'environnement. A l'aide de nombreux exemples et comparaisons, les auteurs démontrent que la durabilité des programmes est tributaire à la fois des facteurs technique, social, économique et institutionnel.

mots-clés: water supply, sanitation, planning, management, evaluation, hygiene, hygiene education, community participation, infrastructure, sustainability

#### ②④ *Alimentation en eau des populations menacées*

auteur: Drouart Eric, Vouillamoz Jean-Michel 300/101066  
 année: 1999 pages: 565pp  
 langue: français isbn: 2 7056 6386 X  
 série: Action contre la faim  
 éditeur: Hermann, 293 rue Lecourbe, F-75015 Paris, France

résumé: Depuis vingt ans, Action contre la Faim engage des programmes de recherche et d'exploitation permettant d'approvisionner des populations en situation de famine. Cet ouvrage est issu de son expérience et présente les méthodes et techniques d'intervention en matière d'accès à l'eau: exploitation des eaux souterraines, traitement et distribution des eaux de surface, collecte des eaux de pluie, mesures d'assainissement, formation et éducation des partenaires locaux, réactions aux situations d'urgence. etc. Ce livre de l'est est destiné aux acteurs impliqués dans les programmes d'alimentation en eau, d'assainissement, de développement et d'intervention humanitaire.

mots-clés: water supply, sanitation, technology, operation and maintenance, low-cost



With reference to the water management guide the following additional titles are recommended:

- 
- (25) ***PARTICIPATORY LEARNING AND ACTION; A TRAINER'S GUIDE***
- authors: Jules N Pretty, Irene Guijt, Jan Scoones, John Thompson  
 year: 1995 isbn: 1 899825 00 2  
 pages: 267 language: english  
 publisher: IIED, International Institute for Environment and Development, London
- 
- (26) ***WINNING GROUP RESULTS***
- authors: Karin Klebert, Einhard Schrader, Walter G. Straub  
 year: 1992 pages: 162  
 language: english isbn: 3 922789 36 6  
 publisher: Windmühle GmbH, Hamburg
- 
- (27) ***WHAT PRICE WATER?***  
***User participation in paying for Community - based water supply***
- author: Christine van Wijk-Sijbsma  
 year: 1988 pages: 82  
 language: english isbn:  
 series: Occasional Paper 10:  
 publisher: IRC, P.O.Box 93190, 2509 AD The Hague, Netherlands
- 
- (28) ***SDC - SECTOR POLICY ON WATER SUPPLY AND SANITATION***
- author:  
 year: 1994 pages: 52  
 language: English  
 publisher: SDC, Swiss Development Cooperation, Berne
- 
- (29) ***WATER AND SANITATION KNOWLEDGE SYSTEM***  
***An Instrument for the Evaluation of Interacting Processes in Water and Sanitation Projects***
- author: Werner Fuchs  
 year: 1994 pages: 36  
 language: english isbn: 3 908001 45 5  
 publisher: SDC, Swiss Development Cooperation, Berne and SKAT, St. Gallen
- 
- (30) ***GUIDANCE MANUAL ON WATER SUPPLY AND SANITATION PROGRAMMES***
- author:  
 year: 1998 pages: 338  
 language: english isbn: 0 906055 58 X  
 publisher: DFID, Department for International Development, London
- 
- (31) ***COOPERATION PLANNING, a Working Aid for Beginners and for more experienced Planners***
- author:  
 year: 1993 pages: 62  
 language: english isbn:  
 publisher: SDC, Swiss Development Cooperation, Berne (Evaluation Service)
- 
- (32) ***COMMUNITY MANAGEMENT TODAY, The Role of Communities in the Management of Improved Water Supply Systems***
- authors: Phil Evans, Brian Appleton  
 year: 1993 pages: 35  
 language: english isbn:  
 series: Occasional Paper 20  
 publisher: IRC, P.O. Box 93190, 2509 AD The Hague, Netherlands

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③③ **TOOLKITS FOR PRIVATE PARTICIPATION IN WATER AND SANITATION**

---

authors:  
 year: 1997 isbn: 0 8213 4003 4  
 publisher: The World Bank, 1818 H Street, NW, Washington, DC 20433 USA

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③④ **WHITE PAPER ON A NATIONAL WATER POLICY FOR SOUTH AFRICA**

---

author: Department of Water Affairs and Forestry, South Africa  
 year: 1997 language: english  
 isbn: 0 621 17707 5  
 publisher: Directorate Communication Service, Department of Water Affairs and Forestry, Private Bag X313, Pretoria 0001, South Africa

---

③⑤ **SKAT/Helvetas/AGUASAN Regional Workshop Lesotho: MONITORING AND EVALUATION OF WATER AND SANITATION PROJECTS**

---

authors: David Hall, Karl Wehrle, Jürg Christen  
 year: 1993 pages: 110  
 language: english isbn:  
 publisher: SKAT, Swiss Centre for Development Cooperation in Technology and Management St. Gallen

---

③⑥ **SKAT / AGUASAN Workshop: TRANSFER OF OWNERSHIP IN WATER SUPPLY AND SANITATION SYSTEMS**

---

author:  
 year: 1996 pages:  
 language: english isbn:  
 publisher: SKAT, Swiss Centre for Development Cooperation in Technology and Management St. Gallen

---

③⑦ **SKAT / AUGASAN Workshop: LESS WATER FOR MORE PEOPLE**

---

author: Bruno Strebel  
 year: 1997 pages: 95  
 language: english isbn:  
 publisher: SKAT, Swiss Centre for Development Cooperation in Technology and Management St. Gallen

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③⑧ **SKAT / AUGASAN Workshop: TECHNOLOGY AND BALANCED DEVELOPMENT**

---

author: Stephan Niederer  
 year: 1998 pages: 84  
 language: english isbn:  
 publisher: SKAT, Swiss Centre for Development Cooperation in Technology and Management St. Gallen

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③⑨ **SKAT / AGUASAN Workshop: PRIVATE SECTOR - JUST A (NEW) HOPE?**

---

author: Urs Fröhlich  
 year: 1999 pages: 88  
 language: english isbn:  
 publisher: SKAT, Swiss Centre for Development Cooperation in Technology and Management St. Gallen

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## APPENDIX B *ABBREVIATIONS*

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ATP	Ability to pay
CBM	Community based Management
CT	Caretaker
DEZA	Direktion für Entwicklungszusammenarbeit (SDC)
DFID	Department for International Development, London
DWSS	Drinking Water Supply and Sanitation
EIA	Environmental Impact Assessment
ESA	External Support Agency
GOPP	Goal-oriented Project Planning
GTZ	Gesellschaft für Technische Zusammenarbeit (Technical Cooperation, Federal Republic of Germany, Eschborn)
HELVETAS	Swiss Association for Development Cooperation, Zurich
HRD	Human Resource Development
ID	Institution Development
IDWSSD	International Drinking Water and Sanitation Supply Decade
IIED	International Institute for Environment and Development; London
IRC	International Water and Sanitation Centre; The Hague / Netherlands
IRED	Development Innovations and Networks (Secretariat General, Geneva)
M + E	Monitoring and Evaluation
MC	Maintenance Committee
MEPI	Monitoring, Evaluation, Planning and Implementation
NETWAS	Network for Water and Sanitation
NGO	Non-Governmental Organisation
O + M	Operation and Maintenance
PRA	Participatory Rural Appraisal
PROWWESS	Promotion of Role of Women in Water and Environmental Sanitation Services
SDC	Swiss Agency for Development Cooperation (DEZA), Berne
SKAT	Swiss Centre for Development Cooperation in Technology and Management, St. Gallen
SWPO	Successes-Weaknesses-Potentials-Obstacles
TOT	Training of Trainers
USAID	US Agency for International Development, Washington
VHW	Village Health Worker
VLOM	Village Level Operation and Maintenance
VWC	Village Water Committee
W + S	Water Supply and Sanitation
WASH	Water and Sanitation for Health Project (USAID)
WATSAN	Water and Sanitation
WHO	World Health Organisation
WSKS	Water and Sanitation Knowledge System
WTP	Willingness to pay
ZOPP	Zielorientierte Projekt-Planung [=GOPP]

## APPENDIX C

**INTERNATIONAL NETWORK FOR WATER AND SANITATION**

The table below allows a quick overview of some organisations and their field of activities. For more comprehensive information, you can visit WatsanWeb, a website developed by SKAT ([http://www.skat.ch/ws/link/watsan/www\\_index.htm](http://www.skat.ch/ws/link/watsan/www_index.htm)). WatsanWeb intends to provide professionals with up-to-date information on various aspects of the Water and Sanitation sector.

Name	Address	Resource centre	Technology consulting	Management consulting	Capacity building / training	Project implementation	Funding agency
<b>CINARA</b>	A.A. 25 157 Cali Colombia web: <a href="http://cinara.univalle.edu.co">cinara.univalle.edu.co</a>	×	×	×	×		
<b>CREPA</b> Centre Régional pour l'Eau Potable et l'Assainissement à Faible Coût	03 B.P. 7112 Ouagadougou 03 Burkina Faso web: <a href="http://www.oieau.fr/crepa/">www.oieau.fr/crepa/</a>	×	×	×	×		
<b>CSIR</b>	P.O. Box 395 Pretoria 0001 South Africa web: <a href="http://www.csir.co.za">www.csir.co.za</a>		×	×	×		
<b>FAKT GmbH</b> Consult for Management, Training and Technologies	Gänsheidestrasse 43 D-70184 Stuttgart Germany web: <a href="http://www.fakt-consult.de">www.fakt-consult.de</a>	×	×	×	×		
<b>GATE / GTZ</b> German Appropriate Technology Exchange	Postfach 5180 D-65726 Eschborn Germany web: <a href="http://www.gtz.de/gate">www.gtz.de/gate</a>	×					×
<b>Helvetas</b> Swiss Association for International Cooperation	Postfach CH-8042 Zürich Switzerland web: <a href="http://www.helvetas.ch">www.helvetas.ch</a>				×	×	×
<b>ICRC</b> International Committee of the Red Cross	19, avenue de la Paix CH-1202 Geneva Switzerland web: <a href="http://www.icrc.org">www.icrc.org</a>			×	×		×
<b>IHE Delft</b> I.H.E. Infrastructure, Hydraulics, Environment	P.O. Box 3015 Westvest 7 NL-2601 DA Delft Netherlands web: <a href="http://www.ihe.nl">www.ihe.nl</a>	×	×	×	×		
<b>IRC</b> International Water and Sanitation Centre	P.O. Box 2869 NL-2601 CW Delft Netherlands web: <a href="http://www.irc.nl">www.irc.nl</a>	×	×	×	×		

Name	Address	Resource centre	Technology consulting	Management consulting	Capacity building / training	Project implementation	Funding agency
<b>ITDG</b> Intermediate Technology Development Group	Bourton Hall Bourton on Dunsmore GB-Rugby CV23 9QZ United Kingdom web: <a href="http://www.itdg.org">www.itdg.org</a>	×					
<b>ITN Training Network</b>	4th Floor Lwua Bldg. Katipunan Avenue Balara Quezon City Philippines web: <a href="http://www.itnphil.org.ph">www.itnphil.org.ph</a>	×	×	×	×	×	
<b>IWSD</b> Institute of Water and Sanitation Development	7 Maasdorp Avenue Alexandra Park Mount Pleasant Harare Zimbabwe web: <a href="http://www.icon.co.zw/iwspd/">www.icon.co.zw/iwspd/</a>	×	×	×	×		
<b>MSF</b> Médecins sans Frontières	MSF International Office Rue de la Tourelle, 39 B-1040 Brussels Belgium web: <a href="http://www.msf.org">www.msf.org</a>				×	×	×
<b>Mvula Trust</b>	PO. Box 32351 Braamfontein 2017 South Africa web: <a href="http://www.mvula.co.za">www.mvula.co.za</a>	×	×	×	×	×	×
<b>NETWAS</b> Network for Water and Sanitation International	PO. Box 15614 Magadi Road, off Langata Road Nairobi Kenya web: <a href="http://www.netwasgroup.com">www.netwasgroup.com</a>	×	×	×	×		
<b>OXFAM</b>	274 Banbury Road GB-Oxford OX2 7DZ United Kingdom web: <a href="http://www.oxfam.org">www.oxfam.org</a>	×					×
<b>pS-Eau</b> le programme Solidarité Eau	32, rue Le Peletier F-75009 Paris France web: <a href="http://www.gret.org/pseau/">www.gret.org/pseau/</a>	×	×	×	×		
<b>SANDEC</b> Water and Sanitation in Developing Countries	Postfach 611 CH-8600 Dübendorf Switzerland web: <a href="http://www.sandec.ch">www.sandec.ch</a>	×	×	×	×		
<b>SDC</b> Swiss Agency for Development and Cooperation	Freiburgstr. 130 CH-3003 Bern Switzerland web: <a href="http://www.sdc.admin.ch">www.sdc.admin.ch</a>				×	×	×

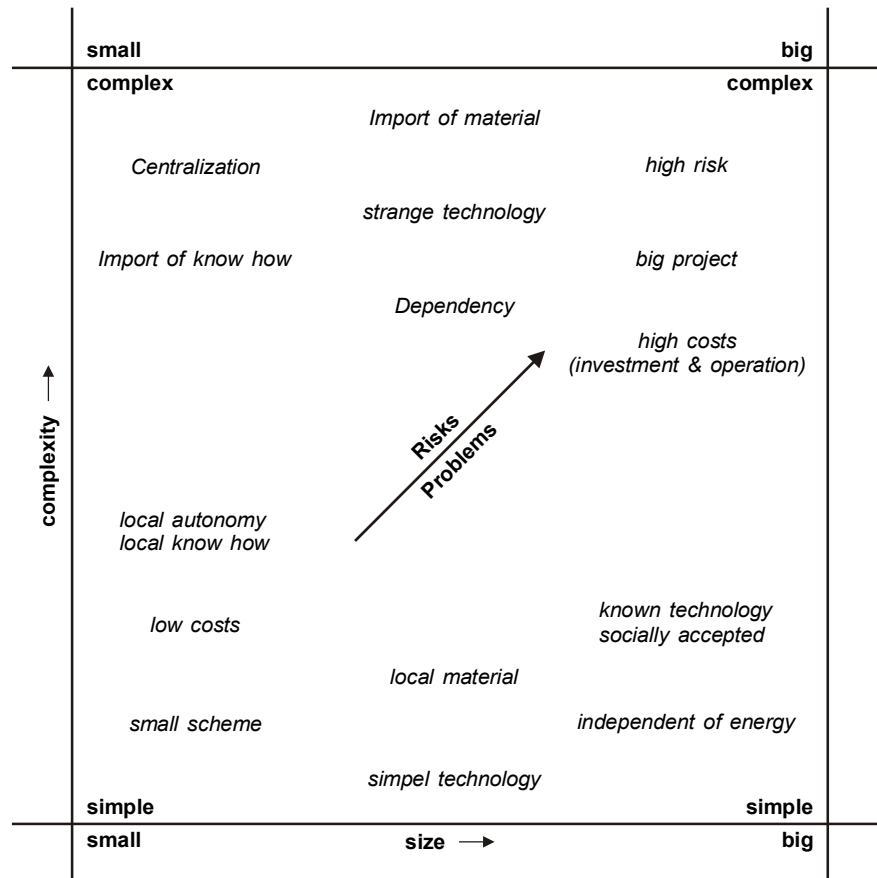
Name	Address	Resource centre	Technology consulting	Management consulting	Capacity building / training	Project implementation	Funding agency
<b>SKAT</b> Swiss Centre for Development Cooperation in Technology Management	Vadianstrasse 42 CH-9000 St.Gallen Switzerland web: <a href="http://www.skat.ch">www.skat.ch</a>	×	×	×	×	×	
<b>STI</b> Swiss Tropical Institute	Postfach CH-4002 Basel Switzerland web: <a href="http://www.sti.ch">www.sti.ch</a>	×	×	×	×	×	
<b>UNICEF</b> Water, Environment and Sanitation	3 UN Plaza, TA 26A New York, NY 10017 United States web: <a href="http://www.unicef.org/programme/wes/">www.unicef.org/programme/wes/</a>				×	×	×
<b>WaterAid</b>	Prince Consort House 27-29 Albert Embankment GB-London SE1 7UB United Kingdom web: <a href="http://www.wateraid.org.uk">www.wateraid.org.uk</a>				×	×	×
<b>WEDC</b> Water Engineering and Development Centre	Loughborough University of Technology GB-Loughborough LE11 3TU United Kingdom web: <a href="http://www.wedc.ac.uk">www.wedc.ac.uk</a>	×	×	×	×		
<b>WELL</b>	c/o London School of Hygiene & Tropical Medicine Keppel Street GB-London WC1E 7HT United Kingdom web: <a href="http://www.lboro.ac.uk/well/">www.lboro.ac.uk/well/</a>	×	×	×	×		
<b>WHO</b> Water, Sanitation and Health	World Health Organization CH-1211 Geneva 27 Switzerland web: <a href="http://www.who.int/water_sanitation_health/index.html">www.who.int/water_sanitation_health/index.html</a>	×	×	×	×	×	×
<b>World Bank, WSP</b> Water and Sanitation Program	1818 H Street, NW Washington, DC 20433 United States web: <a href="http://www.wsp.org">www.wsp.org</a>			×	×		
<b>WSSCC</b> Water Supply and Sanitation Collaborative Council	c/o WHO 20 Avenue Appia CH-1211 Geneva Switzerland web: <a href="http://www.wsscc.org">www.wsscc.org</a>		×	×	×		

## APPENDIX D      *APPROPRIATE TECHNOLOGY CHECKLIST*

Copies of this form can be filled for evaluation and relative comparison of various options.

No.	Factor	Problem -	Influencability, handling easy	Supportive, corrective measures needed	Project: ..... Option: ..... Date: .....
		Opportunity +	good + difficult -	Y N O	
<b>1)</b>	<b><u>Human resources and institutional capacity</u></b>				Y = Yes N = No - = Problem, negative + = Opportunity, positive O = Pronounced, strong aspect
11	Traditional experience, skills				
12	Availability of local skilled labour				
13	Availability of local unskilled labour				
14	Local institutional capacity				
15	Capacity for community management				
16	Government capacity				
17	NGO capacity				
19	Privat sector's capacity				
20					
<b>2)</b>	<b><u>Human resources development (HRD) and institution development (ID)</u></b>				
21	Requirements for HRD (deficits)				
22	Requirements for ID (deficits)				
23	Training facilities for HRD				
24	Training facilities for ID				
25					
<b>3)</b>	<b><u>Physical, natural and commerical resources</u></b>				
31	Local material for construction				
32	Local fabrication				
33	Imported goods (problem?)				
34	Equipment for construction				
35					
<b>4)</b>	<b><u>Development and environmental aspects (± impact)</u></b>				
41	Impact on water cycle				
42	Impact on soil, land and vegetation				
43	Other environmental impacts				
44	Impact on health				
45	Economic impact				
46	Legal and political impact on users				
47	Legal and political impact on third parties				
48	Other impact on users				
49	Other impact on third parties				
50					
<b>5)</b>	<b><u>Finances</u></b>				
51	Investment in local currency				
52	Investment in foreign currency				
53	Running costs (O + M)				
54	Depreciation / replacement				

No.	Factor	Problem - Opportunity +	Influencability, handling easy good + difficult -	Supportive, corrective measures needed Y N O	Project: .....
					Option: .....
					Date: .....
56	Local financing (WTP / ATP)				
57	Economic impact				
58					
<b>6)</b>	<b><u>Technology, concept</u></b>				
61	Standard of project technology				
62	Familiarity with technology / dependency on external assistance				
63	Project size				
64	Local material, spare parts, services				
65	Duration of planning and implementation				
66	Duration of exploitation (lifetime)				
67	Pilot project experience available?				
68	Realisation in stages possible				
69	Energy for operation needed, affordable?				
70	Transport, infrastructure				
72	Reliability, repairability				
73	Risks, unforeseenable problems				
74					

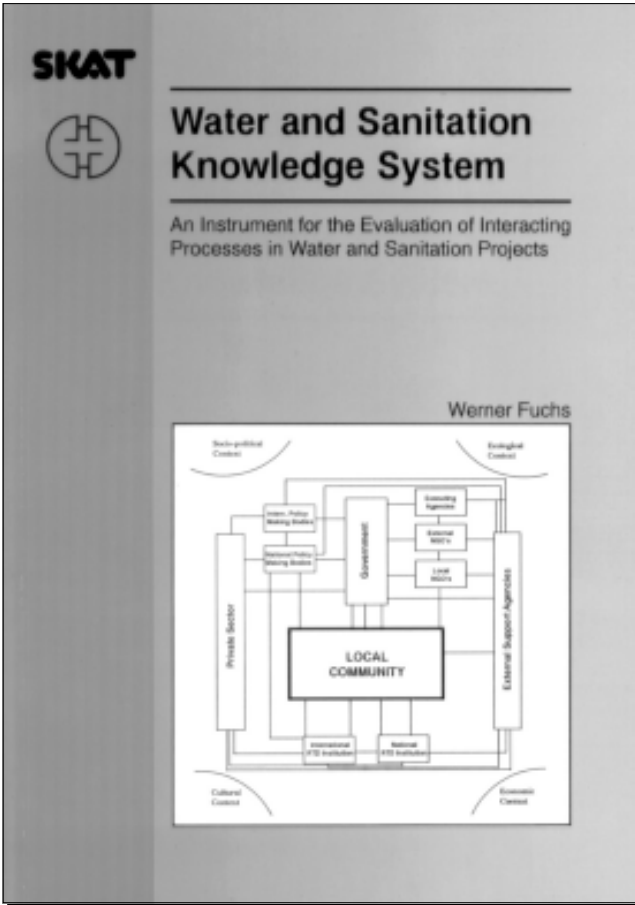


Risks depend on size and complexity of a project



APPENDIX E

**WATER AND SANITATION KNOWLEDGE SYSTEM (WSKS) [29] (see also B 1.3 and C 2)**



*Water and Sanitation Knowledge System*

**Table of contents**

1. Introduction
2. **The starting situation: Water and Sanitation projects are of complex nature**
  - 2.1 Water and sanitation are of global dimension
  - 2.2 Water and sanitation projects/programmes are based on local participation
  - 2.3 The demand for a balanced development
3. **Various actors, diverse interests, multiple relations**
  - 3.1 The contextual conditions
  - 3.2 Diverse interests and focal points meet
  - 3.3 Interacting processes in W&S projects
4. **The Water and Sanitation Knowledge System**
  - 4.1 The structure of the model
  - 4.2 The WSKS initiates a thinking process
5. **Using the WSKS**
  - 5.1 Possibilities to employ the WSKS
  - 5.2 Practical application of the WSKS
    - 5.2.1 The first step: Who takes which place in the WSKS?
    - 5.2.2 The second step: Which relationships are important for the project?
  - 5.3 Practical examples
6. **Further Reading**

*Water and Sanitation Knowledge System*

W+S systems modify the natural water cycle. The resulting secondary effects may hinder other uses of water which are sometimes far away from the water and sanitation system in question. So, ecological aspects of W&S systems are considered transsectorial.

**3. Various actors, diverse interests, multiple relations**

**3.1 The contextual conditions**

Projects and programmes in the area of W&S take place in a field of activity that strongly influences the behaviour, relationships, and conditions of cooperative work of the individual actors, on the macro and micro levels.

Analysing project conditions, it is important to distinguish the different areas according to how a specific actor can influence these conditions. Three areas can be recognized:

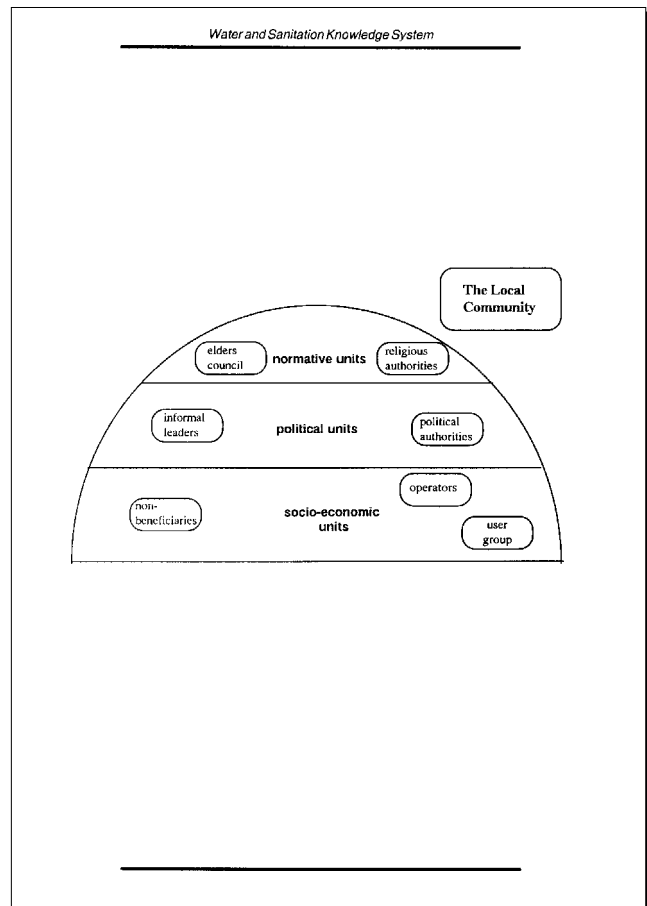
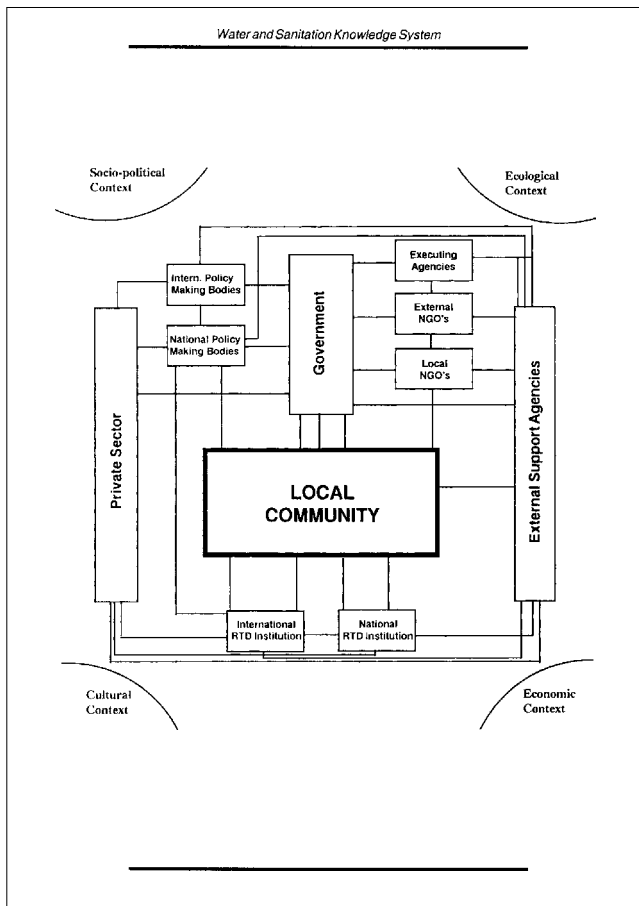
*Water and Sanitation Knowledge System*

Personal sphere of activity	: taking influence, action
Field of activity	: taking position
Framework conditions	: taking notice of

**Framework Conditions**

Water and Sanitation projects/programmes are influenced through the following framework conditions. They may have the same or different effects on the different actors:

- Sociopolitical context
- Cultural context
- Economic context
- Ecological context



*Water and Sanitation Knowledge System*

**Conditions of the Context**

Projects and programmes in the area of W&S take place in specific conditions of a specific context, that strongly influence the behaviour, relationships, and conditions of cooperative work of the individual actors, on the macro and micro levels. Specially important are the factors of sociopolitical, cultural, economical and ecological context. It is noteworthy that the contextual conditions can have quite different effects on the various project partners.

**3.2 Different interests and focal points meet**

The actors of a W&S project/programme can be categorized in three overlapping levels:

Area Actors	local level	regional/national level	international level
Beneficiaries Implementers	User group Operators	Local NGOs Executing Agencies	Executing Agencies
Normative units	Trad. leaders Religious authorities	Policy making bodies Research, Training & Documentation inst.	Policy making bodies Research, Training & Documentation inst.
Political units	Political authorities Informal leaders	Government	External Support Agencies
Socioeconomic units	Private sector Contributors	Private sector Government	Private sector External Support Agencies

**3.3 Interacting processes in W&S projects**

The interactions that occur in and between the various levels of a W&S project are essential requirements of success. Different “channels” can be observed. Decisive for the success of the project is the identification and elimination of “bottlenecks” in key places.

- *The channels of knowledge*

- a) How does the technical, institutional, organizational know-how flow from the international to the national and local level?
- b) How does the knowledge of the users about indigenous technical solutions, the local conditions, necessary adaptations, and specific local situation flow from the local level to the national and international level?
- c) How is the flow of knowledge and information within the user community?

- *Training*

Where does a teaching/learning and training process occur? How is the transition from one level to another and from one actor to the other achieved?

- *The channels of finance and material*

Where does the money within the different levels come from, and how does the money flow between the levels?

- *Other processes and channels within a project-situation*

The question regarding the actors, their positions, and their relationship remains open during all phases of a project (from the planning through realization, and up to the operation and maintenance).

**4. The Water and Sanitation Knowledge System (WSKS)  
Making relationships transparent**

The Water and Sanitation Knowledge System is a model, tool to make transparent the relationships and “channels” of the different actors in W&S projects/programmes. It is an attempt to overcome the simple linear relationship models, and make possible a more complex observation of the mutual influences and feedback. The system helps to identify key actors in the system of relationships of a project/programme and allows to derive plans of action which are possible to incorporate into the practical work.

The basic WSKS model has to be adapted to the specific project/programme, by naming the actors in the actual situation, by defining the concrete issues, be it financial flows, decision making processes, maintenance planning etc.

The model is flexible and new actors and relationships can be integrated without problem.

**4.1 Structure of the model**

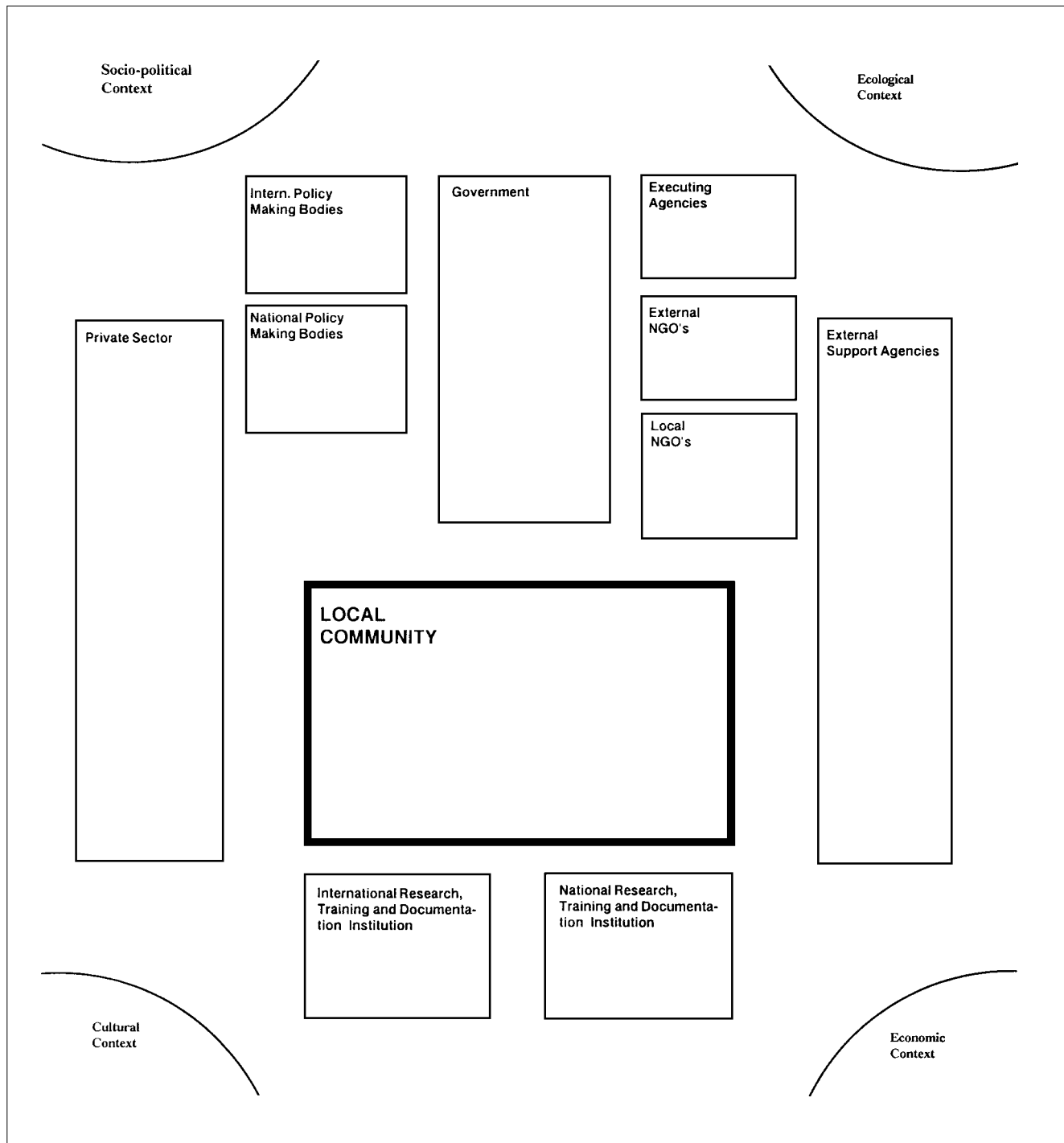
*Local community*

*Government*

*Policy making bodies*

*External Support Agencies/Executing Agencies (ESAs)/NGOs external or local*

*Private Sector*



## COOPERATION PLANNING

A Working Aid for Beginners and for more experienced Planners



Swiss Development Cooperation (SDC)  
Evaluation Service  
CH - 3003 Berne



Theme brochure in the series Working Instruments  
for Planning, Evaluation, Monitoring and  
Transference into Action (PEMT)

December 1993

### *An Orientation Aid for Planning*

#### *How to ensure the project takes root:*

- What are the common, basic **denominators** behind the project request? What **visions** do we have? Why and for what shall there be changes?
- Do the planners recognize and understand the **forces and capabilities** present within the population concerned, their own experience, wishes, knowledge and the way they see themselves?
- What about **social justice**? Which groups are promoted by the project? What can we do to see that the differences between rich and poor, and men and women, do not grow even larger?
- Will the action planned lead to more **self-reliance** for the people concerned or to new dependencies on advisers, partner governments or donors?
- What are the **standards and values** of the various participating groups? How do they vary?

- Is the planning being organized in accordance with **local rules, rhythms, commitments and rituals**? Are we sufficiently circumspect and patient? DO we leave enough room for preparation and the following stabilization of the desired changes?

#### **Strengths of the project:**

- What is hoped to be the main result of the participant's planning? What purpose does their plan serve? What do they wish to achieve with this project? Are they succeeding in working out realistic and attainable goals?
- Is everyone clear that the hoped-for contribution to total development consists of, and what means and resources should be put to use?
- Are the planners taking **existing capacities** into consideration (education, motivation, own economic power, organization level)? Are the foreseen methods appropriate to local conditions technically, economically and ecologically? Can they be accepted, tied in with existing practices and maintained independently by the users?
- Does the project correspond to the **institutional strength and capacity** of the partner organization (realistic estimate of personnel, organization and financial prerequisites)?
- What minimum requirements are necessary for cooperation between the partner institutions? Are there practical possibilities of strengthening their organizational or operational effectiveness? What can be learnt from practical experience, and how can these findings be used for further organizational development?
- Can we profit from these **contrasting views and attitudes**?
- Can social networks or existing institutional connections be put to use? Can the planning be plugged into this **cycle of local energies**?
- How strong is the role played by **individual or group criteria** (e.g. political movements, ideologies, claims to power)? Which of these criteria will endure, which might be changeable, for instance when the important decision makers change?
- Should some **starting security** be offered (e.g. declaration of intent, letter of understanding, showing organizational, technical or financial contributions, etc.)?
- What background documentation (national development plans, sector policies, regional development strategies, country programmes, annual programmes, sector analyses, cross-section analysis, sector policies) serve as **guide lines**? Are our requirements compatible with general development, or do they diverge from these trends?

#### **Use and meaning of the project**

- **Who assesses future benefits?** Which **standards** are required by the participants in the project activities? What are the **standards** of those concerned? Why are there possibly differences in the evaluation of expected project effects?
- **How must the project results be obtained** so that they correspond to a "good and beneficial project performance"? Which is more important: increase in yield or improvement in quality, marketing or home consumption? What is more significant: growing ability to solve problems, or quantitative project aims?
- What **change** lies behind **assessment of benefit**? What criteria are of long-term permanent and general significance (e.g. covering basic living requirements, cultural and ethical values, social authorities)?
- **Does project benefit depend on actual general development** in the project area? Of what does the project contribution consist? When considering benefit, how are unforeseen changes regarded?
- Should the activity planned, or a part of it, be **self-supporting**, or should its usefulness consist of a contribution to the whole system? What is the whole system? In what measure and what period of time is the whole system favoured?

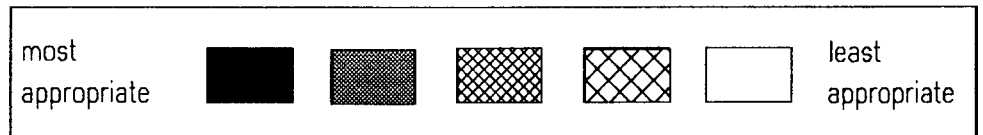
- Will **long-term costs** arise out of the project activities? Does it make sense for these to be borne by the partner country or others, or should they be recovered by the enterprise itself?
- Are **“external” costs** taken into account (e.g. use of official services or transport systems, pressure on the environment)? If not, who bears the costs of these? Is there surety that this happens?
- Are non-renewable, **natural resources** also used in the project? How can sustainable use of renewable resources be guaranteed?
- What **benefits** (e.g. prestige, increase of competence) does the **donor organization** draw from the project?

### Methods and tools

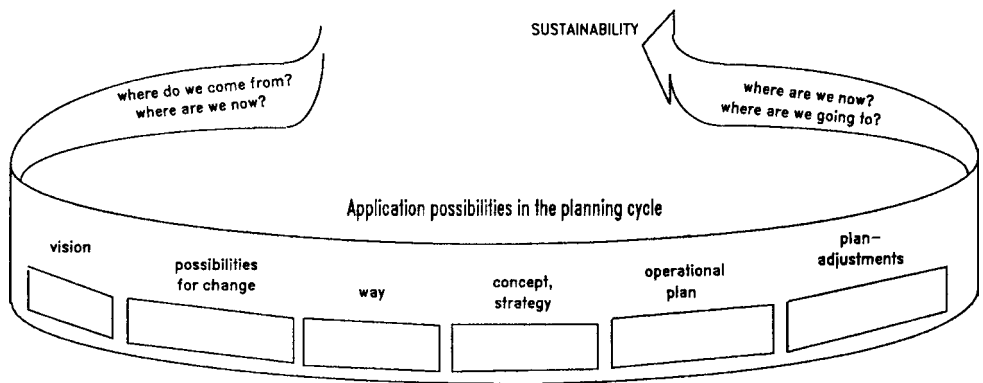
**Brief discussion of their application possibilities, advantages and disadvantages.**

By the term methods is meant the various approaches, ways of expression and forms of presentation that enable participants to become more open and to express their ideas in their own way.

The diagrams below depict the most appropriate application possibilities for each tool according to the followed key:

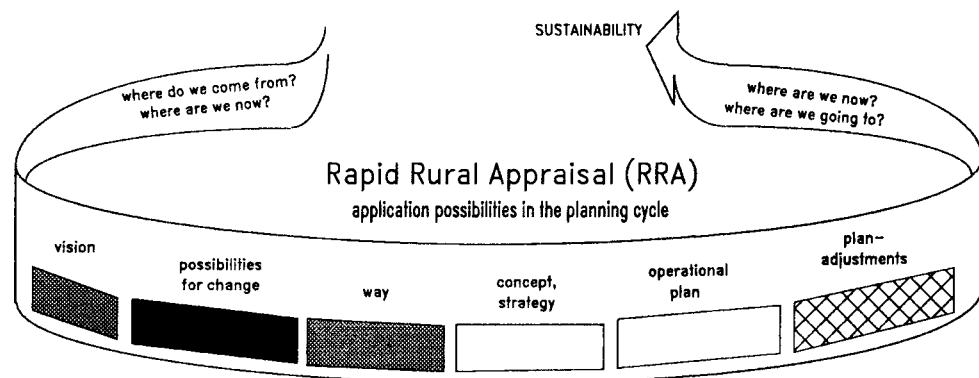


Each method is assessed according to six planning steps which can be represented in the form of a planning loop:



Unless indicated otherwise, the cited literatures can be consulted in the library/documentation centre at SDC, Freiburgstrasse 130, CH-3003 Bern, Switzerland.

## APPENDIX F.1 *Participatory Rural Appraisal (PRA)*



### *Similar/related approaches:*

Participative Rural Appraisal (PR)  
 Participative Learning Methods (PLAM)  
 Farming Systems' Research (FSR)

Farmers First  
 Approach Development  
 Action Research

### *Brief description*

The PRA approach enables us to rapidly and inexpensively assess the most important features of the living conditions of an urban or rural population. The assessment is done primarily by an interdisciplinary team (including at least one member with a social science background) and takes place in the field. A knowledge of and feeling for the local situation are the main criteria for assessment and the point of departure for finding solutions. PRA is designed as an ongoing learning process for both local as well as external participants. A conscious attempt is made to avoid misrepresentations with regard to staff selection, timing, season, route, etc. Tailor-made tools, some of which are developed locally at the time, are used: A few examples are:

- semi-structured interviews
- historical profile (historic milestones)
- ranking of value, priority, weighting, meaning
- seasonal charts, cultivation calendar
- field visit profile
- direct observation, etc.



### *Advantages*

- Related to both problems and potentials.
- Promotes competences and reinforces independence.
- Appropriately accurate – "optimal ignorance": sets the breadth, depth, accuracy and timeliness of information (best bets).
- Compares and takes into account different opinions.
- Evaluates local know-how and technology (confidence building).
- No special methodological knowledge required by local participants.
- Tools can be applied in a flexible fashion (encourages creativity).





### ***Problems in application, methodological limitations***

- Leads to overloading: too many steps in too short a time.
- Raises expectations in the community: are the planners prepared for this?
- Findings need to be elaborated further for practical implementation.
- Is situation-specific and thus cannot be compared to or repeated in other RRAs.
- Is adjusted to local time concepts and can therefore be very time-intensive.
- Requires openness, an ability to empathise, sincerity and an understanding for tradition on the part of the professional planner.

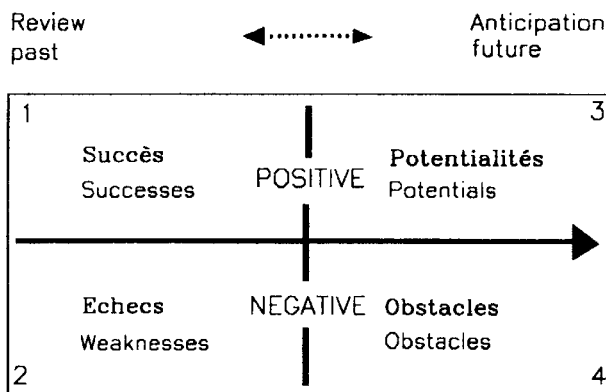
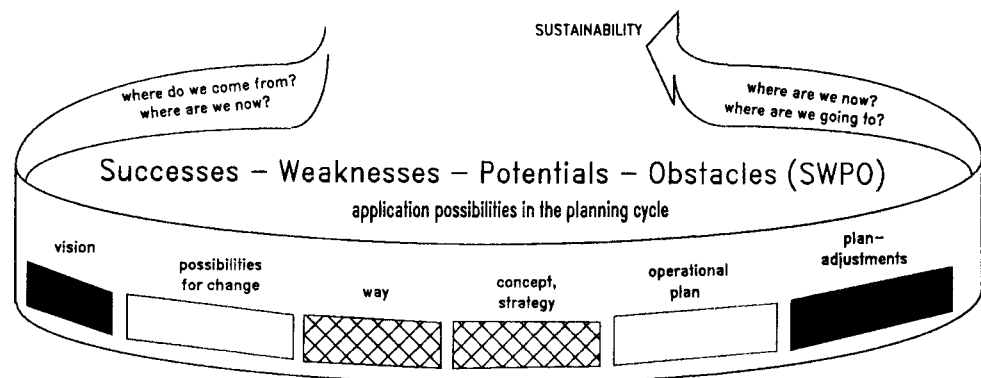
### ***Reference document***

- McCracken/Pretty/Conway: Introduction to RRA for agricultural development, IIED, 3 Endsleigh Street, London WC1H 0DD, U.K (1988)

### ***Additional reading material***

- Chambers, R.: Relaxed and participatory rural appraisal – notes on practical approaches and methods, Brighton. (1991)
- Chambers/Pretty/Thompson: RRA-training course Appenberg. (1992). Compilation of documents, Intercooperation, P.O. Box 1651, 3001 Bern
- RRA Notes Series, Sustainable agriculture programme, IIED, 3 Endsleigh Street, London WC1H 0DD, U.K. (Documents on practical PRA since 1988)
- Participatory Rural Appraisal (PRA) – ein Verhaltensansatz mit Werkzeugkiste, Evaluation Service, SDC.
- Forest, Trees & People Newsletter, c/o IRDC, Swedish University of Agricultural Sciences, Box 7005, S-750 07 Uppsala, No. 15/16 (1992).

## APPENDIX F.2 Successes – Weaknesses – Potentials – Obstacles

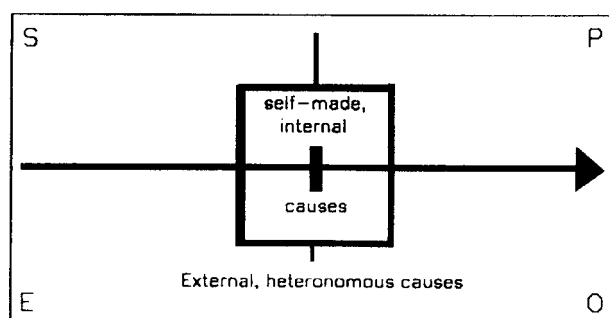


### Brief description

SWPO is a simple, flexible and versatile working tool for situational analyses in groups. It has the advantage that it can easily be understood in an intercultural setting. It records the positive and negative experience of the participants (successes-weaknesses), as well as their assessment of potentials and possible difficulties (potentials-obstacles) in a given situation.

It is important to begin the process positively with successes!

### External/internal causes

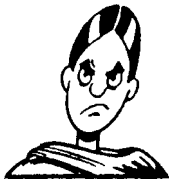


This tool is also suitable for more differentiated analysis of issues such as consensus/disagreement, internal/ external influences and factors which can/cannot be changed. It is also useful in time sequence analyses, assessment of indicators and role clarification.



### Advantages

- Simple (the partners can quickly apply the method themselves).
- Motivating character (positive approach, no previous methodological knowledge required).
- Versatile.
- The joint review provides clarity on different opinions.
- Enables the participation of socially weaker parties on an equal basis (illiterate persons can express themselves through pictures or symbols).
- No special materials are needed.

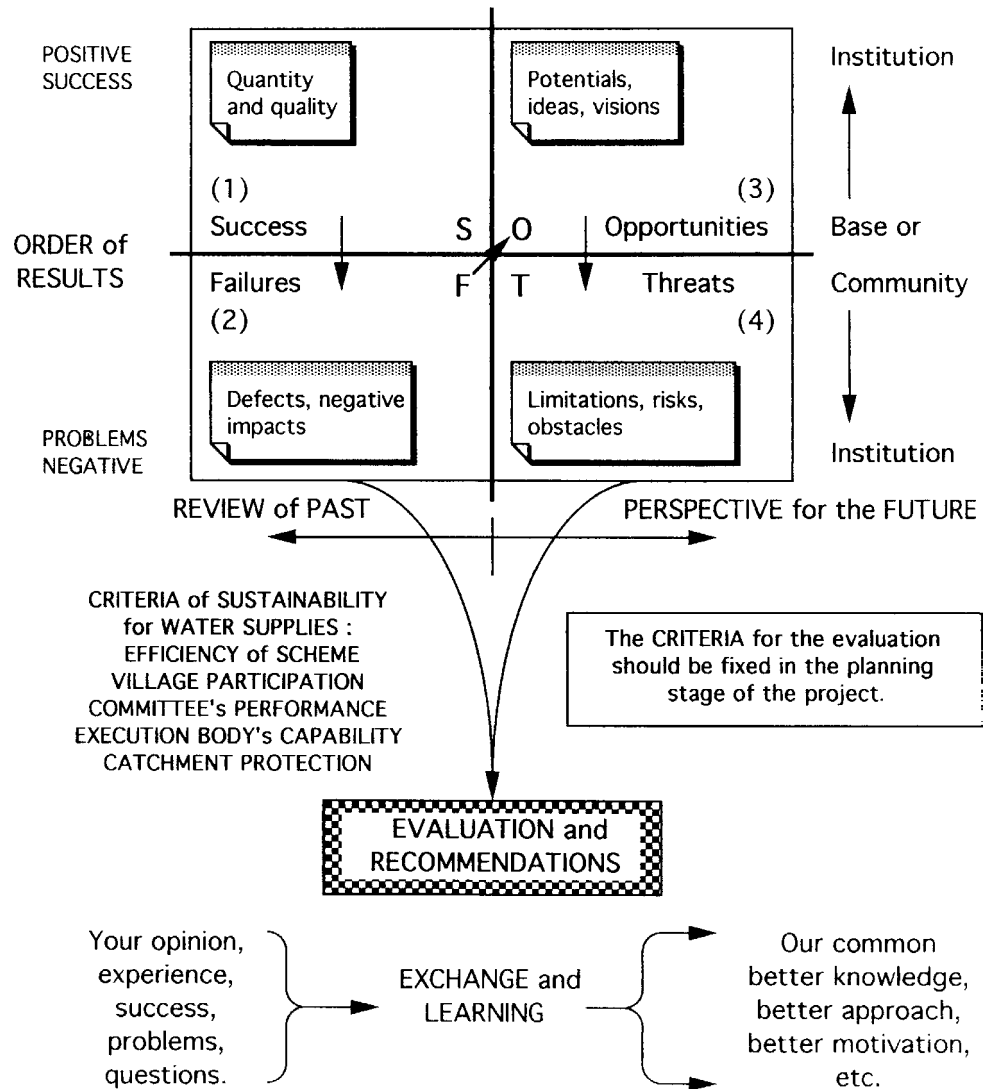


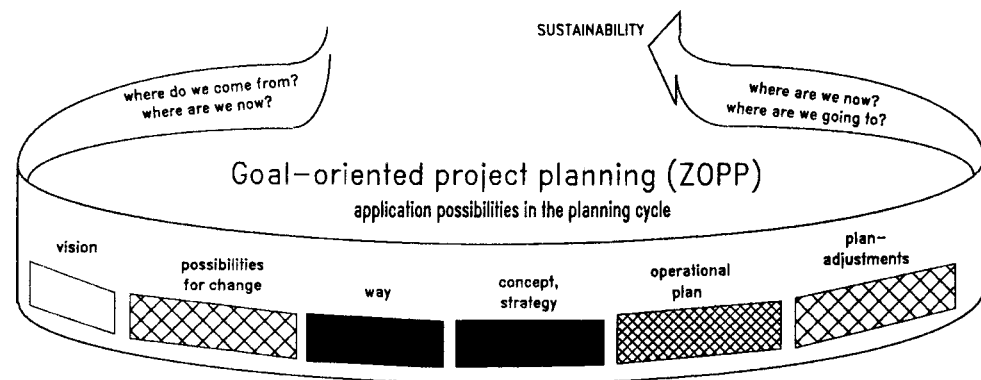
**Problems in application, methodological limitations**

- SWPO does not offer any solutions; it merely serves to provide clarification and to structure opinions, thereby disclosing first moves towards possible changes.
- There is a risk of self-censure.
- The moderator must have a basic knowledge of visualisation methods.

**Reference document**

- SWPO – a working tool; published as part of the series entitled “Working instruments for planning, evaluation, monitoring and transference into action (PEMT)”; SDC Evaluation Service (1992) (available in German, French, English and Spanish).



**Similar/related approaches:**

Logical framework approach (LFA)

**Brief description**

Objectives-oriented project planning is a systematic goal-directed planning method based on teamwork and visualisation. It essentially consists of five steps which can be divided into sub-steps.

1. **Participation analysis:** The participants and persons involved in the problem situation are identified and their positions described.
2. **Problem analysis:** The problems are arranged in a problem hierarchy or "problem tree": The point of departure is the jointly-identified core problem, which is expressed in terms of a cause and effect relationship.
3. The **objectives hierarchy** emerges from the conversation of the "problem tree" to a "tree of objectives": Cause and effect relationships are converted into "what – if hypotheses".
4. **Alternative solutions to problems:** This step consists of a critical examination of the analysis of the objectives by posing the leading question "are there also other ways?" At best the answers should lead to different approaches to solutions.
5. **Project planning matrix:** The project planning matrix shows which project activities should lead to which results and which project activities should help in reaching the project purpose. The relationship of this project purpose to the overall development goal is explained. The matrix summarises the following information on one page:
  - why the project should be implemented;
  - what does the project ultimately hope to achieve;
  - in which way does the project hope to reach its results;
  - which external factors/assumptions are important for attaining the objectives;
  - ways of measuring whether the objectives have been reached;
  - where can the information required for evaluating the project be found; and
  - how much will the project cost.

The format of the project planning is illustrated in the following pages. The numbering refers to the sequence in which individual aspects are dealt with.

Summary of objectives and activities	Objectively verifiable indicators	Sources of verification	Important assumptions
<p>The overall goal, to which the project makes a contribution</p> <p>1. How should we formulate the overall goal, taking the analysis of the objectives into account?</p>	<p>Indicators for achieving the overall goal</p> <p>9. How can specific objectives, i.e. steps towards reaching the overall goal, be defined in quantifiable terms (if necessary in goal phases)?</p> <p><b>Features:</b> Quality, quantity and time framework; if applicable, locality and target group.</p>	<p>12. What database or other information is available or accessible to prove the achievement of objectives?</p>	<p>In the long-term safeguarding of the objectives</p> <p>8. Which external factors are necessary to guarantee a long-term safeguarding of the achieved contribution to the overall goal?</p>
<p><b>Project purpose</b></p> <p>2. Which project purpose (other than the manageable factors of the project matrix) would contribute significantly to the achievement of the overall goal?</p>	<p>Indicators that confirm the successful achievement of the project purpose</p> <p>10. How can specific objectives for fulfilling the project purpose be defined in quantifiable terms (if necessary in goal phases)?</p> <p><b>Features:</b> Quality, quantity and time framework; if applicable, locality and target group.</p>	<p>13. What database or other information is available or accessible to prove the achievement of objectives?</p>	<p>In reaching the overall goal</p> <p>7. Which external factors are necessary so that the aimed-at steps for reaching the overall goal do actually take place?</p>
<p><b>Results</b></p> <p>3. Which results (as a total and with their combined effectiveness) are needed to achieve the anticipated effect (project purpose)?</p>	<p>Indicators which substantiate the results produced</p> <p>11. How can specific objectives for each individual result be defined in quantifiable terms (if necessary in goal phases)?</p> <p><b>Features:</b> Quality, quantity and time framework; if applicable, locality and target group.</p>	<p>14. What database or other information is available or accessible to prove the achievement of objectives?</p>	<p>In achieving the project purpose</p> <p>6. Which important assumptions which cannot be influenced by the project, or are purposely defined as external factors, must occur with regard to results 1 so that the project purpose is achieved?</p>
<p><b>Activities</b></p> <p>4. Which activities (also as a complex package of measures) must the project undertake / - implement so that the specified results 1 to x can occur?</p>	<p>Specification of inputs and costs for each individual activity</p> <p>15. What would it cost and what inputs (including personnel in months) would be required to implement each individual activity?</p>	<p>16. Which documents can verify the staff resources, expenses, inputs and use of material?</p>	<p>In producing results</p> <p>5. Which important assumptions which cannot be influenced by the project, or are purposely defined as external factors, must occur with regard to activities 1 to x so that the results are achieved?</p>
<p>Avoid extreme differentiation of results and activities</p>	<p>Qualitative features are to be increasingly taken into account; central trends are more important than exact and detailed information</p>	<p>The subjective assessment of the groups affected are also sources of information</p>	<p>Emphasise more strongly than usual; regularly check validity and if necessary make adjustments in the whole project planning matrix</p>

**Project planning matrix**

(Source: GTZ: ZOPP - Einführung in die Grundlagen der Methode, Eschborn 1987)

If project purpose - then overall goal

If results - then project purpose

If activities - then results

**Development hypotheses**

**Manageable factors**

Additional Comments of the authors: > > > >



### **Advantages**

- Promotes mutual understanding of problems
- Clarifies cause and effect relationships.
- The project planning matrix provides a clear and unambiguous working basis.
- Facilitates monitoring.
- Enables the participation of beneficiaries and persons involved.
- Standardises concepts and fosters consensus.
- Well-documented.



### **Problems in application, methodological limitations**

- "Reality" is not only accessible through a logical and rational approach; contradictions, intuition and feelings are not taken into account.
- Tendency to unacceptable over-simplification of complex problems (linear thinking): automatic conversion of problems into objectives.
- Fixating on problems hampers discovering creative potentials.
- Encourages the detailed description of uncertain developments as well as the drive to achieve objectives at all costs.
- Societies without a formalised analytical and abstract planning culture do not have easy access to the ZOPP method.
- The method forces a premature selection of "reality excerpts".
- Time-intensive, requires a high degree of logistics and involves a planning language which is specific for that form of moderation and material; not easily adaptable.
- A prerequisite for participation is that participants have a knowledge of the process involved.

### **Additional reading material and comments on the methodology**

- GTZ: Methoden und Instrumente der Projektplanung und -durchführung, Eschborn (1991)
- GTZ: Monitoring und Evaluierung in Projekten der Technischen Zusammenarbeit, Eschborn (1992)
- NORAD: The Logical Framework Approach, a Handbook, Oslo (1982)
- GTZ Abt. 012/Högger R.: Von Feen, Schlangen und Planern – ein Erfahrungsbericht zur Frage ZOPP oder Flopp?, Eschborn (1989)
- DEH Evaluationsdienst / Grosser E.: Anwendungsbereiche, Stärken und Schwächen der Zielorientierten Projektplanung, Feldafing (1989)
- Arbeitsgemeinschaft Entwicklungspolitischer Gutacher (AGEG): Erfahrungsaustausch über die Anwendung und Weiterentwicklung von ZOPP, Berlin (1991)
- Kohnert D. et al.: ZOPP in der Projektpraxis; Freie Universität Berlin, Manuskript, Berlin (1990)
- Lecomte B: Remarque sur la Methode „ZOPP“; Manuskript (1987)
- Stockmann R.: Erste Ergebnisse aus einer Untersuchung zur Nachhaltigkeit von Vorhaben der beruflichen Bildung; Manuskript Universität Mannheim (1992)

**APPENDIX G      *IMPLEMENTATION TOOLS* [31]**

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- G. 1      Operational plan*
- G. 2      Operational management, sector / fieldwise*
- G. 3      Task charts*
- G. 4      Bar charts*
- G. 5      Flow charts*
- G. 6      Brainstorming*

# APPENDIX G.1 Operational Plan

Project: ..... Date: ..... Revision: .....

**OPERATIONAL PLAN** Year: ..... Signature: .....

Ⓐ OBJECTIVES FOR THE YEAR		Ⓑ INPUTS			
		Assumed		Realized (until end of the year)	

Expected		Ⓒ OUTPUTS		Ⓓ MAJOR PROJECT CHANGES	
		Realized (until end of the year)			

Sectors/Fields	No.	Activity	Ⓔ MAIN ACTIVITIES DURING THE YEAR												■ Responsibilities ■ Remarks		
			1	2	3	4	5	6	7	8	9	10	11	12			
1)		Institution building and human resource development															
2)		Community action															
3)		Construction															
4)		<ul style="list-style-type: none"> <li>■ Mech. Workshop</li> <li>■ Vehides/ Equipment</li> <li>■ Tools</li> </ul>															
5)		Finances															
6)		Monitoring / Reporting Sector report Project report															
7)		Management Evaluation															
8)		Various															

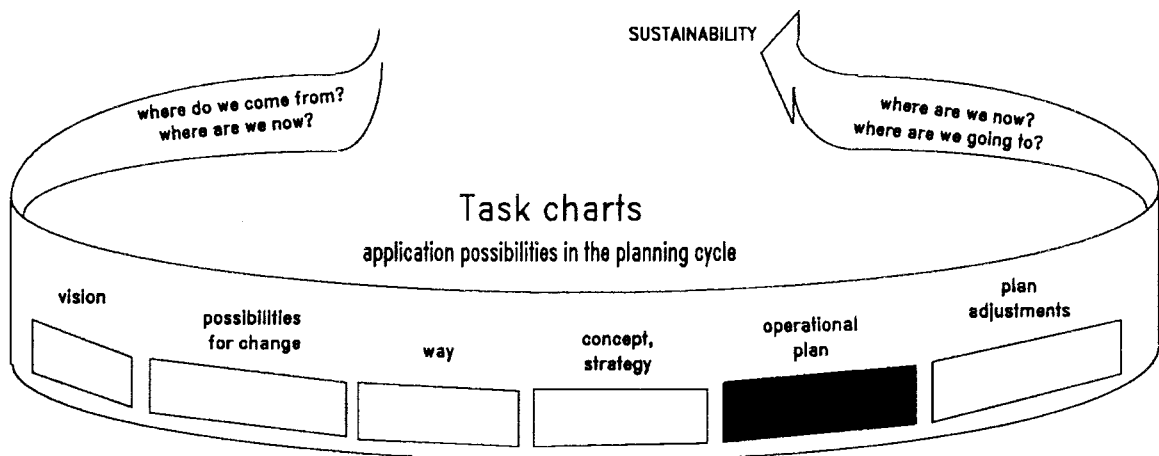
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Figure 21: Operational plan (section C 4.2)





## APPENDIX G.3 Task Charts



### Brief description

Task charts are used to organise work procedures. The functions of the staff at every step are indicated diagrammatically in a chart.

In its simplest form the compiling of an annual report can be depicted as follows:

Participants	Tasks Activities					
	local project leader	external consultant	section head	technical assistant	administrator	community beneficiaries
Review experiences	P/D	p/D	p/im	im	—	d/im
Organisation/structure Arrange report	d	D/im	im	im	i	—
Editing	P/im	p/im	im	im	im/c	—
Approval	Co					

P = Planning      D = Decision-making      im = Implementation  
 Co = Control      I = Information      C = Coordination  
 Capital letters indicate main responsibility; small letters indicate co-responsibility

### Advantages

- The organisational sequence becomes transparent
- Encourages allocation of responsibility
- Provides a good basis for job descriptions



### Problems in application, methodological limitations

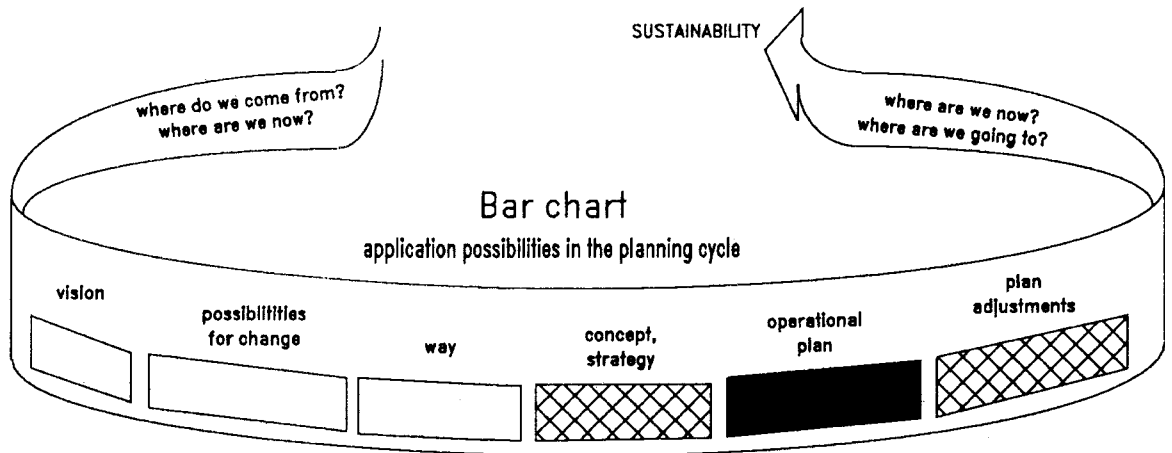
- Graphical over-simplification
- Leads to excessive details



### Reference document

- Dänzer W.F. (Hrsg.): Systems Engineering, Leitfaden zur methodischen Durchführung umfangreicher Planungsvorhaben, Zürich (1989), S. 139 ff.

## APPENDIX G.4 Bar Charts



### Similar/related approaches

Working programme      Gantt-chart

### Brief description

Gantt bar charts are used for the chronological planning of tasks. Individual working steps are listed on the activity axis of the chart. The duration of the activities is indicated on the time axis by bars.

For example: Programme evaluation

Activities	Duration (days)	Implementation time span (e.g. months)									
		1	2	3	4	5	6	7	8	9	10
Evaluation preparation	8	*****									
Evaluation	20			*****							
Workshop preparation	3			*****							
Workshop	1				*						
Follow up	3			*****							

### Advantages

- Graphic and simple
- Wide selection of PC-programmes



### Problems in application, methodological limitations

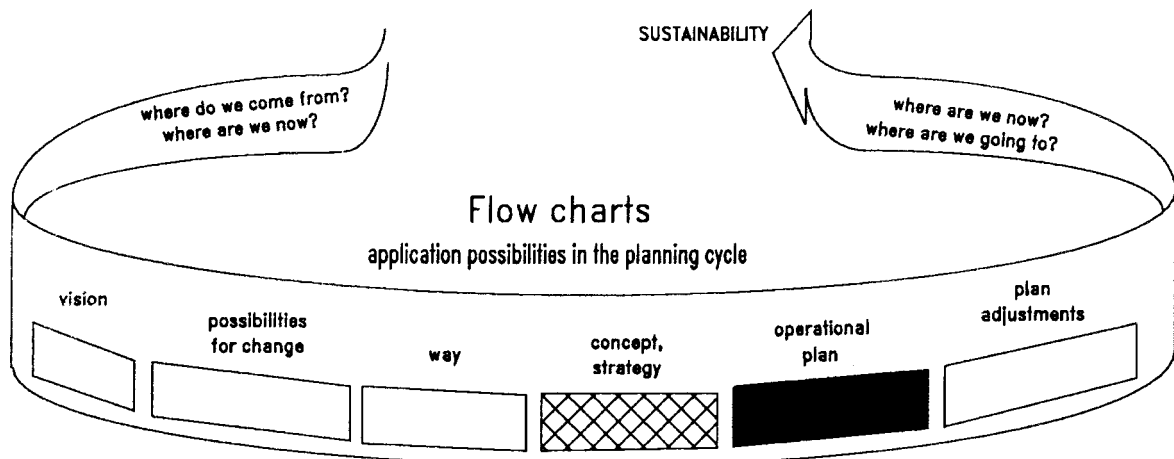
- Updating can be difficult
- Interconnections between activities may not be easily recognizable



### Additional reading material

- Dänzer W.F. (Hrsg.): Systems Engineering, Leitfaden zur methodischen Durchführung umfangreicher Planungsvorhaben, Zürich (1989), S. 191
- Voelkner J.: Planungsmethoden in Verwaltung und Wirtschaft, Regensburg-Berlin-Bonn (1992), S. 13 ff.

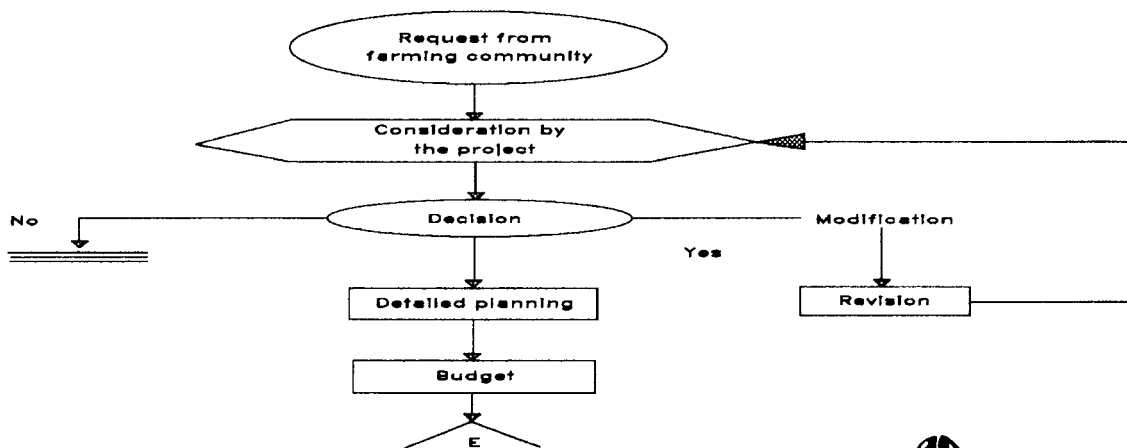
## APPENDIX G.5 Flow Charts



### Brief description

The sequence of the activities of a process is structured in a transparent way in a flow chart. The steps of each activity are represented by symbols such as "start", "develop", "check", "decision" etc.

For example: Request to subsidise erosion control measures



### Advantages

- Simple; easily learnt
- Suitable for planning and control of routine tasks



### Problems in application, methodological limitations

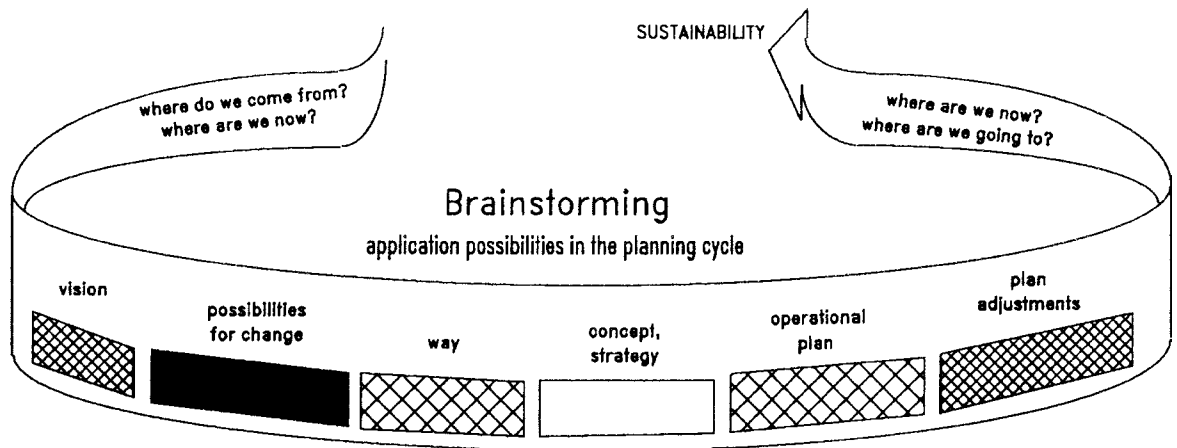
- Suitable only for single processes
- Unsuitable for time-related planning



### Additional reading material

- Dänzer W.F. (Hrsg.): Systems Engineering, Leitfaden zur methodischen Durchführung umfangreicher Planungsvorhaben, Zürich (1989), S. 189 ff.
- Voelkner J.: Planungsmethoden in Verwaltung und Wirtschaft, Regensburg-Berlin-Bonn (1992), S. 79 ff.

## APPENDIX G.6 *Brainstorming*



### Brief description

Brainstorming produces ideas, explanations and interpretations. In an organised "storming of thoughts", a small group of participants puts forward as many suggestions as possible about a precisely-formulated theme. The method stimulates intuitive seeking and spontaneous-creative association.

Hints on preparation: The topics must be formulated precisely; it must be clearly stated who is to participate and what the time limit is. For the actual brainstorming there are definite rules: no discussion, note every idea without criticising it, combinations and associations of ideas are encouraged. There is no patent on good ideas. The contributed suggestions are usually written on cards and put up on a poster or board. They are then sorted, analysed and evaluated by a small panel. Some sort of classification is useful such as "immediately feasible" and "needs to be developed more".

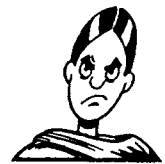
### Advantages

- Easy to moderate and can be quickly carried out.
- Stimulates the solution-seeking process.
- Encourages a chain of thought.
- Versatile in its application.



### Problems in application, methodological limitations

- Few of the suggestions are actually used.
- Only provides initial answers - no applicable solutions.
- The effort involved in analysing and evaluating is often underestimated.



Written variation: **Brainwriting**. Six people come together in a meeting to search for ideas. Three initial solutions are noted on a form which is then passed on to a neighbour for the next round. There are three rounds of five minutes each (variation 6-3-5). The rounds can be varied as required (4-3-6, etc.). Each subsequent round should be slightly longer to enable the participant to build on the ideas of the preceding participants.

### Reference document

Clark Ch.: Brainstorming, München (1970)

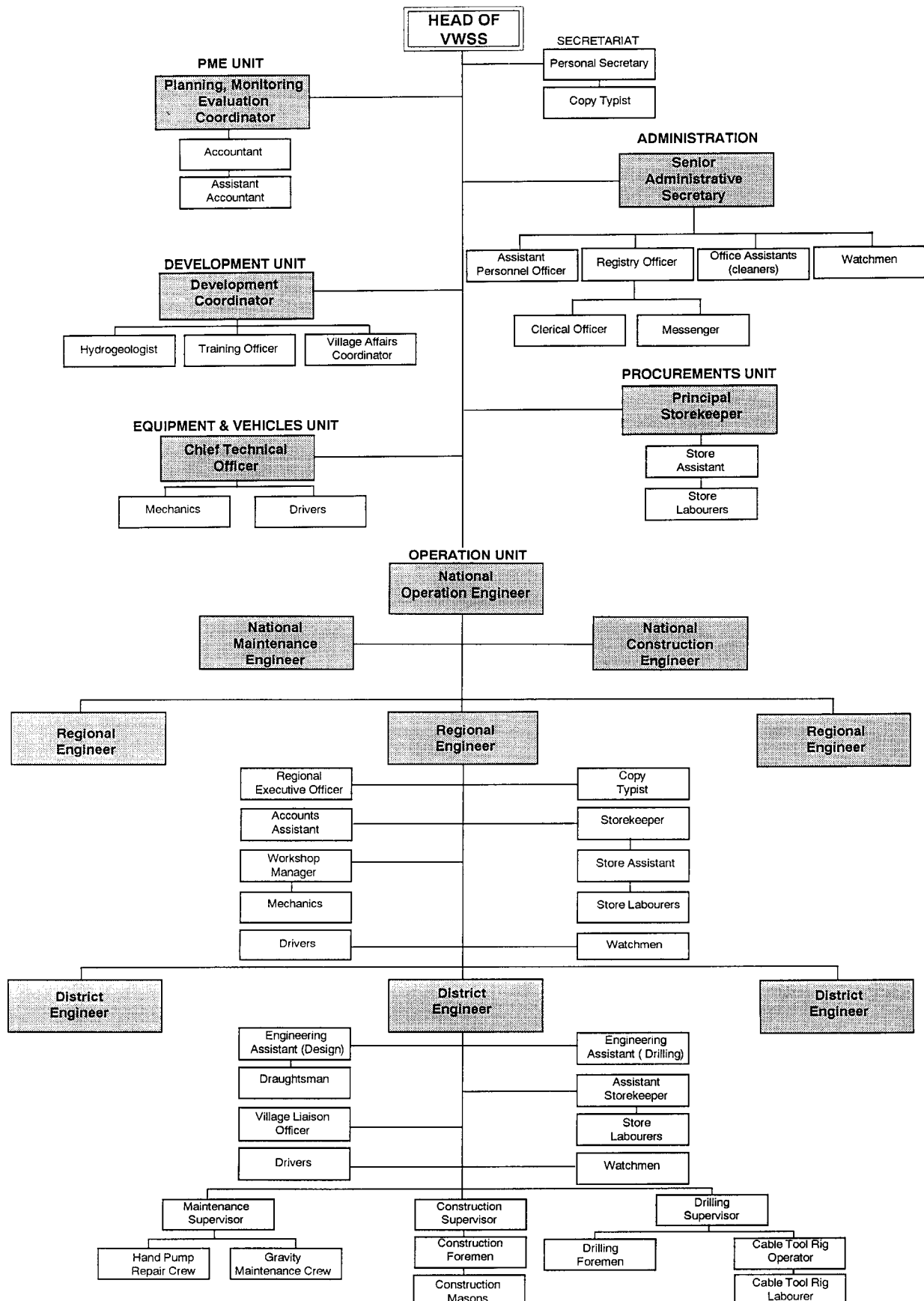
### Additional reading material

- Ulrich W.J.: Kreativitätsförderung in der Unternehmung, Bern-Stuttgart (1975)
- Voelkner J.: Planungsmethoden in Verwaltung und Wirtschaft, Regensburg, Berlin-Bonn (1992), S. 22 ff.

APPENDIX H

**GOVERNMENT ENGAGEMENT IN VILLAGE WATER SUPPLY - LESOTHO** (Backstopping report SKAT, 1991)

*MINISTRY OF INTERIOR, CHIEFTAINSHIP AFFAIRS AND RURAL DEVELOPMENT  
Village Water Supply Section  
Organisational Structure 1991*



(Department of Water Affairs and Forestry, April 1998: Extract)

*White Paper on a National Water Policy for South Africa**Department of Water Affairs and Forestry*

# CONTENTS

Preamble: Water in our lives	i
Introduction: A New South Africa and a New Water Law	2
Summary of Policy Approaches	3
<b>SECTION A: The New Context for Water Management in South Africa</b>	
1. Setting the Context	6
1.1 Scope and Purpose	6
1.2 Structure	6
1.3 The Process	6
1.4 Acknowledgements	6
2. The New South African Context	7
2.1 The Constitution and Water	7
2.2 Water and South Africa's Development Vision	8
3. The International Context	
3.1 Trends in International Water Policy	11
3.2 International Obligations and Agreements	11
<b>SECTION B: New National Water Policy</b>	
4. Water Resource Management in South Africa - Principles and Policy	12
4.1 The Objectives of Water Policy in South Africa	12
4.2 Optimum Resource Use and Protection	12
5. Water Resources Policy	14
5.1 The Legal Status of Water	14
5.2 Priorities - The basic needs and environmental reserve and international obligations	16
6. Water Resource Management Policy	
6.1 Water Resources Management Activities	17
6.2 Water Use Authorisations	17
6.3 Protection of Water Resources	18
6.4 Water Utilisation and Conservation	20
6.5 Water Pricing Policy	21
6.6 Development of Water Resources	23
6.7 Public Safety and Disaster Prevention	25
6.8 Monitoring Assessment and Auditing	26
6.9 International Co-operation	27
7. Institutions for Water Management	
7.1 Background and Discussion	28
7.2 Policy Statement on Institutions	29
7.3 Human Resource Development	31
7.4 Research	31
8. Way Forward	
8.1 A National Water Bill	33
8.2 Implementation of New Legislation	33
8.3 Conclusion	33
<b>APPENDIX 1: Fundamental Principles and Objectives for a New Water Law for South Africa</b>	
Introduction	34
Fundamental Principles and Objectives for a New Water Law in South Africa	35
<b>APPENDIX 2: Definition of terms</b>	37

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# PREAMBLE:

## WATER IN OUR LIVES

*Everyone has the right to have access to sufficient water.  
(Bill of Rights, Constitution of South Africa, Section 27 (1) (b) )*

*The dictionary describes water as colourless, tasteless and odourless - its most important property being its ability to dissolve other substances. We in South Africa do not see water that way. For us water is a basic human right, water is the origin of all things - the giver of life. The poet Mazisi Kunene has said: "From water is born all peoples of the earth".*

*There is water within us, let there be water with us. Water never rests. When flowing above, it causes rain and dew. When flowing below it forms streams and rivers. If a way is made for it, it flows along that path. And we want to make that path. We want the water of this country to flow out into a network - reaching every individual - saying: here is this water, for you. Take it; cherish it as affirming your human dignity; nourish your humanity. With water we will wash away the past, we will from now on ever be bounded by the blessing of water.*

*Water has many forms and many voices. Unhonoured, keeping its seasons and rages, its rhythms and trickles, water is there in the nursery bedroom; water is there in the apricot tree shading the backyard, water is in the smell of grapes on an autumn plate, water is there in the small white intimacy of washing underwear. Water - gathered and stored since the beginning of time in layers of granite and rock, in the embrace of dams, the ribbons of rivers - will one day, unheralded, modestly, easily, simply flow out to every South African who turns a tap. That is my dream.*

*Antjie Krog*





# APPENDIX 1.

## FUNDAMENTAL PRINCIPLES AND OBJECTIVES FOR A NEW WATER LAW FOR SOUTH AFRICA



### INTRODUCTION

*By Professor Kader Asmal, MP,  
Minister of Water Affairs and Forestry*

Water is a precious resource that belongs to us all. Our new water law must ensure that the way in which water is distributed and used brings maximum benefit to all South Africans.

Access to water has in the past been the privilege of those with access to land and those with access to economic power. In South Africa, more than 12 million citizens lack access to clean water. Every day infants die from diseases bred of the unavailability of clean and potable water. Among the historically privileged population, infant mortality rates are about 20 per 1000 births. In some water-deprived rural areas we lose 370 infants per 1000 births. We cannot allow such a situation to persist - especially in the presence of our Constitution and the Bill of Rights, signed into law in December 1996, and which require that all citizens should be treated equitably.

The Constitution is the supreme law of the land. All law, and this includes our country's water law, must comply with the Constitution. We must now join together to promote actively the values of our Constitution - amongst others, those values directed at ensuring equity, democracy and fairness.

The Preamble of the Constitution expresses a collective acknowledgement by the people of South Africa of "the injustices of our past". It commits

us to establishing "a society based on democratic values, social justice and fundamental human rights" through, among other things, "improv(ing) the quality of life of all citizens and free(ing) the potential of each person". The Preamble also acknowledges our respect for those South Africans "who have worked to build and develop our country".

As I have said on many occasions, South Africa's water law must reflect the principles of the Constitution. Our new water law must also ensure that the values of the Constitution are felt by all South Africans in their daily lives. The Constitution will be the medium with which we will work in order to achieve a number of important goals such as carrying clean and potable water to our nation's people, promoting economic development and establishing a new approach to the management of this precious resource. In order to achieve these goals, South Africa's water law requires far-reaching change.

All changes to the current water law will take place within the context of fulfilling the rights enshrined in the Bill of Rights of the Constitution. Such rights encompass not only the right to "sufficient water" to meet basic domestic needs. In addition, the Bill of Rights confers upon all citizens a right "... to have the environment protected for the benefit of present and future generations". National Government, as the custodian or public trustee of our water resources, is required to safeguard the integrity of those resources. This will mean not only protecting ecological processes, but also ensuring that allocations to use water are equitably and sustainably distributed. The increasing demands for water and the development of social and economic activities represent a threat to the environment which sustains our water resources. Provision must be made in the legal framework to mediate this conflict and to protect the environment without unnecessarily curbing activities directed at social and economic development.

It is important to ensure that the legal framework governing access to and use of water is supportive of the developmental needs of our nation. In order to achieve the goals that we have set for

ourselves in the Water Law Review process it is vital that we ensure the sustainable availability of water for economic development and growth.

For the reasons I have outlined above, the process of Water Law Review which I described in the April 1996 publication of the "Water Law Principles", will result in change to the existing regime of water law. However, this does not mean that those who presently enjoy access to water will be unable to continue to enjoy a reasonable share of water resources. What is intended is that the framework governing access to water resources is responsive to the needs of all South Africans who have a constitutionally enshrined right of access to sufficient water. These are not opposing objectives. There will neither be a surrender to vested interests nor a water grab.

The new water law will be based on a set of principles. These principles were first published for public comment at the beginning of 1996 and have undergone a number of revisions in order to incorporate the great number of comments received in an extensive programme of public consultation. In April 1996 we called again for comments and received a resounding response of valuable inputs which helped us to take the development of the principles even further. A number of formal consultative meetings were held in the nine provinces in 1996. Sectoral interest groups such as agriculture, industry, mining, municipal users, environmental groups and other advocacy groups have been able to present their views formally and later in bilateral meetings held with me.

The consultation process culminated in the National Water Law Review Conference held in East London on 17 and 18 October 1996. At this conference we discussed the Principles and practical approaches to their implementation. This conference also discussed and provided inputs for the finalisation of the Principles that will guide the drafting of our new water law.

The Principles were discussed and approved by our Cabinet and now carry the title Fundamental Principles and Objectives for a new Water Law in South Africa. The 28 Principles approved by our Cabinet are set out in this document. The process will now be

taken forward by teams appointed by me to assist in the preparation of a White Paper in respect of which I will once again call for your input and comments.

The voice and support of the majority of South Africans is crucial to the process of delivering a new water law and a new approach to water management which is accessible and easily understood.

## FUNDAMENTAL PRINCIPLES AND OBJECTIVES FOR A NEW WATER LAW IN SOUTH AFRICA

### LEGAL ASPECTS OF WATER

#### Principle 1

The water law shall be subject to and consistent with the Constitution in all matters including the determination of the public interest and the rights and obligations of all parties, public and private, with regards to water. While taking cognisance of existing uses, the water law will actively promote the values enshrined in the Bill of Rights.

#### Principle 2

All water, wherever it occurs in the water cycle, is a resource common to all, the use of which shall be subject to national control. All water shall have a consistent status in law, irrespective of where it occurs.

#### Principle 3

There shall be no ownership of water but only a right (for environmental and basic human needs) or an authorisation for its use. Any authorisation to use water in terms of the water law shall not be in perpetuity.

#### Principle 4

The location of the water resource in relation to land shall not in itself confer preferential rights to usage. The riparian principle shall not apply.

### THE WATER CYCLE

#### Principle 5

In a relatively arid country such as South Africa, it is necessary to recognise the unity of the water cycle and the

interdependence of its elements, where evaporation, clouds and rainfall are linked to groundwater, rivers, lakes, wetlands and the sea, and where the basic hydrological unit is the catchment.

#### Principle 6

The variable, uneven and unpredictable distribution of water in the water cycle should be acknowledged.

### WATER RESOURCE MANAGEMENT PRIORITIES

#### Principle 7

The objective of managing the quantity, quality and reliability of the nation's water resources is to achieve optimum, long term, environmentally sustainable social and economic benefit for society from their use.

#### Principle 8

The water required to ensure that all people have access to sufficient water shall be reserved.

#### Principle 9

The quantity, quality and reliability of water required to maintain the ecological functions on which humans depend shall be reserved so that the human use of water does not individually or cumulatively compromise the long term sustainability of aquatic and associated ecosystems.

#### Principle 10

The water required to meet the basic human needs referred to in Principle 8 and the needs of the environment shall be identified as "the Reserve" and shall enjoy priority of use by right. The use of water for all other purposes shall be subject to authorisation.

#### Principle 11

International water resources, specifically shared river systems, shall be managed in a manner that optimises the benefits for all parties in a spirit of mutual co-operation. Allocations agreed for downstream countries shall be respected.

### WATER RESOURCE MANAGEMENT APPROACHES

#### Principle 12

The national Government is the custodian of the nation's water resources, as an indivisible national asset. Guided by its duty to promote the public trust, the

National Government has ultimate responsibility for, and authority over, water resource management, the equitable allocation and usage of water and the transfer of water between catchments and international water matters.

*Principle 13*

As custodian of the nation's water resources, the National Government shall ensure that the development, apportionment, management and use of those resources is carried out using the criteria of public interest, sustainability, equity and efficiency of use in a manner which reflects its public trust obligations and the value of water to society while ensuring that basic domestic needs, the requirements of the environment and international obligations are met.

*Principle 14*

Water resources shall be developed, apportioned and managed in such a manner as to enable all user sectors to gain equitable access to the desired quantity, quality and reliability of water. Conservation and other measures to manage demand shall be actively promoted as a preferred option to achieve these objectives.

*Principle 15*

Water quality and quantity are interdependent and shall be managed in an integrated manner, which is consistent with broader environmental management approaches.

*Principle 16*

Water quality management options shall include the use of economic incentives and penalties to reduce pollution; and the possibility of irretrievable environmental degradation as a result of pollution shall be prevented.

*Principle 17*

Water resource development and supply activities shall be managed in a manner which is consistent with the broader national approaches to environmental management.

*Principle 18*

Since many land uses have a significant impact upon the water cycle, the regulation of land use shall, where appropriate, be used as an instrument to manage water resources within the broader integrated framework of land use management.

*Principle 19*

Any authorisation to use water shall be given in a timely fashion and in a manner which is clear, secure and predictable in respect of the assurance of availability, extent and duration of use. The purpose for which the water may be used shall not arbitrarily be restricted.

*Principle 20*

The conditions upon which authorisation is granted to use water shall take into consideration the investment made by the user in developing infrastructure to be able to use the water.

*Principle 21*

The development and management of water resources shall be carried out in a manner which limits to an acceptable minimum the danger to life and property due to natural or manmade disasters.

## WATER INSTITUTIONS

*Principle 22*

The institutional framework for water management shall as far as possible be simple, pragmatic and understandable. It shall be self-driven and minimise the necessity for State intervention. Administrative decisions shall be subject to appeal.

*Principle 23*

Responsibility for the development, apportionment and management of available water resources shall, where possible and appropriate, be delegated to a catchment or regional level in such a manner as to enable interested parties to participate.

*Principle 24*

Beneficiaries of the water management system shall contribute to the cost of its establishment and maintenance on an equitable basis.

## WATER SERVICES

*Principle 25*

The right of all citizens to have access to basic water services (the provision of potable water supply and the removal and disposal of human excreta and waste water) necessary to afford them a healthy environment on an equitable and economically and environmentally sustainable basis shall be supported.

*Principle 26*

Water services shall be regulated in a manner which is consistent with and supportive of the aims and approaches of the broader local government framework.

*Principle 27*

While the provision of water services is an activity distinct from the development and management of water resources, water services shall be provided in a manner consistent with the goals of water resource management.

*Principle 28*

Where water services are provided in a monopoly situation, the interests of the individual consumer and the wider public must be protected and the broad goals of public policy promoted.



## APPENDIX K *PROJECT AGREEMENT*

(Example of Community Development Programme, Cameroon)

Project.....

Agreement N° .....

### **AGREEMENT OF COOPERATION**

#### **between**

HELVETAS, Swiss Association for Development and Cooperation, P.O. Box 114, Bamenda, represented by its Programme Director or Technical Adviser (hereinafter called "HELVETAS")

#### **and**

.....  
represented by M..... Address:.....  
..... (hereinafter called "the Project Executing Body")

#### **and**

Village ..... in ..... Sub-Division of  
..... Division, represented by M.....  
and M..... Chairman and Member respectively of the  
Development or Project Committee. Address:.....  
..... (hereinafter called "the Project Holder")

#### **regarding**

the execution of the ..... project  
according to the feasibility study, the detailed technical plans, calculations and cost  
estimate and the plan of execution (see annex 1).

#### **1. Financial Contribution**

The cost estimate of the project amounts to FCFA.....  
Corresponding to the cost sharing calculation (see annex 2), the financment is  
provided as follows:

- 1.1 The Project Holder covenants to contribute
 

in kind	FCFA .....	to date .....
in cash	FCFA .....	to date .....
<b>Total</b>	<b>FCFA .....</b>	
- 1.2 Helvetas covenants to contribute in cash
 

FCFA .....
------------
- 1.3 Other funds given by .....  
and controlled by HELVETAS:
 

FCFA .....
------------

- 1.4 The grants mentioned under paragraph 1.2 and 1.3 shall be spent only after having received the cash contribution of the Project Holder.
- 1.5 The Project Holder covenants to refrain from external over-financing. If the Project Holder files applications for financial support with other donors, Helvetas must be informed in advance in writing. Any grants for the same project must be reported to Helvetas.
- 1.6 The Project Holder covenants to open a project account and to ensure proper book-keeping and auditing of such accounts.
- 1.7 All contributions under this agreement are non-refundable grants.

## **2. Commitments of the Project Holder**

Apart from the obligations mentioned under paragraph 1, the Project Holder covenants:

- 2.1 to be in charge of the project after final control/report and to make the project accessible to the entire village population
- 2.2 to engage in operation and maintenance of the project.
- 2.3 In case of a water supply, the Project Holder covenants further
  - to nominate one caretaker and one assistant
  - to organize and support a maintenance committee
  - to collect project maintenance taxes
  - to pay repairs and compensate the caretakers
  - to protect the catchment area

## **3. Commitments of the Project Executing Body**

The Project Executing Body covenants:

- 3.1 to be responsible for the execution of the project according to the approved project study, cost estimates and related plan of execution
- 3.2 to take full responsibility for the supervision of work and quality and to control frequently technicians and project workers on the site
- 3.3 to train the caretaker "on the job" who will be paid by the project during the construction
- 3.4 to receive advances from Helvetas and to furnish original receipts for all expenses
- 3.5 to submit proforma invoices for sums exceeding 100,000 FCFA to Helvetas who will issue their cheques to the order of the suppliers

- 3.6 to forward detailed progress and quality reports including schedule for the next period of six months to Helvetas and to the Project Holder every 30th June and 31st December
- 3.7 to forward a final report (including final inspection) not more than two months after completion of the project
- 3.8 to assist the Project Holder to operate and to maintain the completed project.

#### **4. Commitments of Helvetas**

Apart from the financial contribution mentioned under paragraph 1, Helvetas covenants:

- 4.1 to give technical and organisational advice
- 4.2 to participate in the final inspection of the executed project
- 4.3 to support a training course for a caretaker and an assistant caretaker two years after project completion at the latest.

#### **5. Reporting and Auditing**

- 5.1 Each party to this agreement shall forward a half-yearly report to the other parties, containing the following information:
  - its own half-yearly income and contribution to the project (kind and/or cash)
  - other funds received from or promised by government or other organisations and bodies for the same project
  - short report on the project situation and problems encountered.

5.2 Each party shall assure proper auditing of all its accounts.

#### **6. Communication and approval of major changes of project**

- 6.1 Any intention by any one party to this agreement to make any major change or variation of the project design and/or programme must be communicated to the other parties for mutual discussions.
- 6.2 In this regard, the written approval of the other parties concerned must be sought and received before the change or variation is effected.

**7. Completion of project**

- 7.1 The Project to be undertaken in this agreement shall be accomplished not later than the year .....
- 7.2 After completion the project shall remain at all times the property of the entire village and not belonging to any particular quarters or any group of individuals.
- 7.3 The Executing Body shall officially hand over the completed project to the Project Holder and issue a handing over note.

**8. Validity and termination of agreement**

- 8.1 This agreement shall begin after the signature of all the partners and remain valid until the project is realized.
- 8.2 In the event of a serious default by one of the contracting parties towards any commitment or obligation under this agreement, the other parties may terminate this agreement without delay by written notice. Beyond this, the agreement can be dissolved any time by any one party. In that case, prior written notice has to be given at least three months in advance of the intended termination of the agreement.

**For the Project Holder:**

..... (signature) ..... (place and date)

..... (signature) ..... (place and date)

**For the Project Executing Body**

..... (signature) ..... (place and date)

**For Helvetas**

..... (signature) ..... (place and date)

Annex 1: Plan of execution  
Annex 2: Cost sharing calculation

## APPENDIX L

**SOCIO – ECONOMIC QUESTIONNAIRE**  
**(Assessment of local context)**

(Example of Community Development Department, Cameroon)

**Socio-economic Questionnaire****Introduction**

This questionnaire is designed to provide information about any village requesting financial assistance for a project from Helvetas or through Helvetas/BOTA in the following fields:

- economic potentials
- development activities
- location and accessibility
- willingness and ability to contribute towards the realization of the project

It should also provide information on institutions, managerial capacities and any other knowledge that exists in the village that could be used to realize and manage the completed project.

Helvetas/BOTA will use the information obtained to process the villages' application for financial assistance only. So the decision on whether the villages' project should be assisted or not will be based on the information provided in the questionnaire; so it is very necessary that the information given should be precise and reliable. It is advisable that the questionnaire be completed in the village with the participation of the village development committee, the Fon, traditional council and other resource persons in the village.

**I. Location of the village**

Village ..... Local Council .....

Sub-Devison ..... Devison ..... Province .....

Distance to

1. Sub-Devisonal Headquarter .....

2. Divisional Headquarter .....

**II. Community**

1. Total population .....

2. Beneficiary population .....

3. Men .....

4. Women .....

5. Children .....

6. Villagers living out of the village .....

**III. Structure of the community**

1. Number of quarters .....

2. Number of chiefs .....

3. Number of quarter heads .....

4. Traditional council (attach list) .....

5. Village council (attach list) .....



**IV. Infrastructure**

1. Number of primary schools .....
2. Number of health centres .....
3. Number of cooperative societies .....
4. Number of churches .....
5. Number of secondary schools .....
6. Government services in the village .....
- .....
7. Market(s)..... daily or weekly .....
8. Water .....
9. Electricity .....
10. Accessibility of village by road .....

**V. Economy**

1. What are the main sources of income for the villagers? .....
- .....
2. What is the main occupation of the villagers? .....
- .....
3. Are there any farming groups or other income generating groups in the village? (If yes, name them) .....
- .....
- .....
4. Other sources of income for the villagers .....
- .....

**VI. Community development organization**

1. Does a Village Development and Cultural (committee) Association exist? .....
- Name: .....
2. Formed on the (date) .....
3. How many branches exist outside the village? .....
4. How many people are in executive functions? .....
5. How many of them are women? .....

**VII. Completed self-help activities**

1. Type of activities (names) .....
2. When started .....
- ..... completed .....

- 3. What was the contribution of the village in cash/kind? .....
- 4. Who else contributed and how much? .....
- 5. What problems did you encounter during the implementation? .....
- 6. Is there a management (maintenance) committee for these projects? .....

**VIII. How are women involved in development projects?**

.....

.....

.....

**IX. Information about**

- 1. On going self-help activities .....
- 2. The project for which assistance is requested .....
- 3. The project committee .....
- 4. How the village will be organized to handle its obligation during the execution should be included as annexes to the project report .....

**Person(s) responsible for this information:**

- 1. .... Date .....
- 2. .... Date .....  
name and signature
- 3. .... Date .....  
Chief of the village

## APPENDIX M      *FORMS*

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M. 1	Possible stakeholders	Table 1
M. 2	Project objectives and related targets	Table 6
M. 3	Project organization I / actual situation / starting position	Table 7
M. 4	Comparison and ranking of alternatives	Table 10
M. 5	The stakeholder's responsibilities (R) and duties (D)	Table 11
M. 6	Issues commonly covered in the statutes of a local water committee – an example	Table 13
M. 7	Job description for a water supply caretaker – an example for a small gravity system	Table 14
M. 8	Financial planning and financial management in infrastructure projects	Table 15
M. 9	Monitoring and rating for water supply projects – an example form Cameroon	Table 16
M. 10	The water and sanitation knowledge system, WSKS	Figure 29
M. 11	Project cycle – diagram	Figure 12
M. 12	The variety of planning tools / guidelines	Table 18
M. 13	A view of planning steps, conditions and respective tools	Table 20
M. 14	Relevance matrix of causes and effects – for environmental impact assessment or effects monitoring	Table 21
M. 15	Watershed management – supportive measures for a rural water supply programme in Cameroon	Table 22
M. 16	Basic elements of monitoring (example Burkina Faso)	Figure 37
M. 17	The SWPO method (see also Appendix F.2)	Figure 38
M. 18	The filing system – an example from Kenya	Table 25
M. 19	Logical framework for HRD-activities (from GOPP / ZOPP)	Table 28
M. 20	Teaching methods; characteristics	Table 27

APPENDIX M. 1

	Description	formal	informal	obligatory	optional	Functions, influences, effects
<u>Local</u> (Village, community)						
<u>Regional</u> (Watershed, district, ....)						
<u>External (beyond)</u> (province, nat. government, nat. NGO, foreign NGO, donor)						

Table 1: Possible stakeholders

APPENDIX M. 2

No.	Items, parameters	Targets, objectives		Remarks
		short-term (5 years)	long-term (25 years)	
1	<u>Demand-related items</u> – Population to be served (number) ..... – Institutions ..... – Irrigation / farming ..... – Animals ..... – Other activities ..... – .....			
2	<u>Local financing capacity / objectives</u> – Investment (%) ..... • population ..... • local institutions ..... • local government ..... – Running costs (%) ..... • population ..... • local institutions ..... • local government ..... – Proposed water tariff structure ..... .....			
3	<u>Organizational / institutional objectives</u> – Ownership ..... – Supervision ..... – Management ..... – Operation + maintenance ..... – Follow-up ..... – .....			
4	<u>Ecological objectives / targets</u> – Watershed management ..... – Spring protection ..... – .....			
5	<u>Proposed modification of standards defined in Table 2</u> – ..... – .....			
6	<u>Other objectives</u> – ..... – .....			

Table 6: *Project objectives and related targets*  
 (Details see Engineering Manual [Vol. 2])

APPENDIX M. 3

Project name: .....		Date: .....	
Project holder: .....		Revisions: .....	
<b>PROJECT ORGANIZATION I</b>		.....	
<b>Actual situation</b>	(Key conclusions of assessment (3.2) and evaluation (3.4) of local context)	Remarks, references, reasons	
<b>1) Positive results, achievements, factors</b>			
11	Local context assessment, structured according SWPO-method		
12			
13			
14			
15			
16			
<b>2) Problems, weaknesses, deficiencies</b>			
21			
22			
23			
24			
25			
26			
27			
<b>3) Opportunities, resources</b>			
31			
32			
33			
34			
35			
36			
<b>4) Omissions, risks</b>			
41			
42			
43			
44			
45			
46			
<b>5) Basic documents, external conditions</b>			
51			
52			
53			
54			
55			
56			
<b>6) Main project objectives</b> (essence of and link to 3.3)		(Variations from the original project objectives should be indicated here.)	
61			
62			
63			
64			
65			
66			

Table 7: Project organisation I / Actual situation / starting position

APPENDIX M. 4

Field	Criteria		Project alternatives								Project: .....	
	No.	Description	Impor- tance Factor 1 - 3	A) Zero Solution		B) Improvment		C) Decentral solution		F) Central solution		Date: .....
				Rating	Weight	Rating	Weight	Rating	Weight	Rating	Weight	Remarks
① General	01.	High priority, compared with other development programmes										Remarks Rating (+2 ÷ -2)
	02.	Project optimally based on local resources (staff, material)										
	03.	Good replicability in area (typical for region)										
	04.	High degree of sector integration										
		Weight of the field										
② Social	11.	Good cultural integration										
	12.	High acceptance by community (consumers)										
	13.	Dependency on outside assistance										
	14.	Noticeable easing of women's work										
		Weight of the field										
③ Institutional	21.	Appropriate project structure (committee and organigram)										
	22.	Easy to manage										
	23.	High degree on inter-institutional integration										
	24.	Conformity with national plans and standards										
		Weight of the field										
④ Economy	31.	Investment										
	32.	Running cost (20 years)										
	33.	Economic impact										
	34.	Realistic, fair and accepted tariff structure										
		Weight of the field										
⑤ Technology	41.	Quantity of service (coverage)										
	42.	Water quality										
	43.	Comfort level										
	44.	Low complexity, low risk, high reliability and long lifetime										
	45.	Based on / adapted to local skills										
	46.	Stageability / flexibility										
⑥ Training / Rules Regulations		51. Local people can learn and do it										
		52. Legal problems can be solved easily										
		Weight of the field										
⑦ Ecology / Nature		61. Ecologic sustainability										
		62. Few and low-level ecological secondary effects										
		Weight of the field										
		<b>Rank / Total weight</b>										

Table 10: Comparison and ranking of alternatives

## APPENDIX M. 5

Stakeholder		Planning	Implementation	O + M
<b>A Community</b>	R			
	D			
<b>B Local government</b>	R			
	D			
<b>C Project management (executing body)</b>	R			
	D			
<b>D Provincial water engineer</b>	R			
	D			
<b>E Private sector; NGO</b>	R			
	D			

Table 11: *The stakeholders' responsibilities (R) and duties (D)*



## APPENDIX M. 6

<u>General characteristics:</u>	Name, place of residence and purpose of the organization; Date of establishment; Legal status; Project location, size;
<u>Membership:</u>	Qualifications and conditions for membership; Procedures for application , acceptance and cancellation as member of the organization;
<u>Administration and sectoral integration:</u>	Compliance with national policies and development plans; Integration in national and regional structures; Administrative and sectoral coordination and integration;
<u>Sources of income:</u>	Contributions, rates, subsidies, loans and other revenues;
<u>Committee(s):</u>	<u>Composition:</u> number and function of committee members; composition of executive committee, and sub-committees where necessary; <u>Election:</u> occasion, procedure; length of term of office; possibility of re-election; by-elections in case of resignation, etc.; <u>Representation:</u> of the interest of all user categories, including women and low-income households <u>Functions:</u> responsibilities and authority of each function, character of the work (voluntary or paid; type of payment)
<u>Meetings:</u>	<u>Committee(s):</u> frequency, purpose and authority of meetings of the committee(s) <u>General assemblies:</u> frequency of assembly; minimum period between announcement and assembly; user information on time, place, purpose; <u>Purposes of meeting:</u> rendering and account of the preceding period; appointment of a financial control committee for the next financial period; recruitment and election of committee members; other relevant business etc.; <u>Validity of meetings:</u> representation of various user categories; voting rights (e.g. heads of households only, or male and female heads, or one adult, one vote); quorum for important decisions; conditions for a general meeting on request of the users;
<u>Changes:</u>	Procedures for changing the statutes; procedures for winding up the organization.

Table 13:

*Issues commonly covered in the statutes of a local water committee - an example*

APPENDIX M. 7

JOB DESCRIPTION	
<u>Project:</u>	.....
<u>Function:</u>	Water supply caretaker
<u>Function holder:</u>	.....
<u>Contract basis:</u>	Employment contract of: .....
<b><u>Main duties:</u></b>	<b>Preventive maintenance; simple repairs; site management; user communication / advice; recording and reporting to the water committee (WC) ; training and supervising of assistant caretaker; participation in water committee meetings, training</b>
<u>Tasks:</u>	<p><u>Preventive maintenance:</u> visit to water supply structures; control of leakage and hygiene; cleaning of site and drains; upkeep of surroundings (daily)</p> <p><u>Simple repairs:</u> replacement of washers; repair of cracks in masonry; repair of bathing screens, fences, etc. (occasionally, perhaps a few time a year)</p> <p><u>Site management:</u> ensuring proper tap operation and water use; management of laundry and bathing facilities; advising the tap and/or water committee on site maintenance, user regulations and other relevant issues concerning the waterpoint (daily to periodically)</p> <p><u>Management of tools and spare part stock</u> (financial proceedings and competence according projects regulations)</p> <p><u>Working programmes:</u> elaboration of seasonal and weekly programmes (caretaker, assistant, community, external assistance)</p> <p><u>User communication:</u> liaison between the tap users and the water committee; information on reasons and duration of break-downs; demonstration and discussion of proper water use (periodically, perhaps several times a year)</p> <p><u>Monitoring / recording and reporting:</u> for maintenance, repair and water use to the community water committee or other local organization administering the water supply (daily reporting in logbook, summary reports several times a year, according to project regulations, information in water committee meetings).</p>
<u>Representation:</u>	In case of absence of the caretaker the assistant caretaker acts on his/her behalf. If the vice-president of the committee is absent the caretaker represents him/her.
<u>Responsibility:</u>	The caretaker is responsible for the formulated tasks. S/he is subordinated to the water committee. In cases of conflicts and problems s/he contacts the water committee. The approved water supply regulations are a binding guideline.
	Noted and accepted: .....
	The caretaker: ..... For the water committee: .....
	.....

Table 14:

*Job description for a water supply caretaker – an example for a small gravity system*

## APPENDIX M. 8

Task, Action		Executors / Contributors							Ordinary Controller(s)	Documents, Forms	Remarks	
		Central Government	Local Government	Community project-holder	Committee, together With executing body Function Holder	Local NOG (facilitator)	External Support Agency	Others				
<b>ECONOMIC / FINANCIAL PLANNING</b>											X leader O contributor y year m month	
- National and regional development plans	5 y	X	O									
- Local development plans	3 - 5 y		X	O			O	O	O			
- National and regional Finance plan	5 y	X	O									
- Local finance plan	3 - 5 y		x	O			O	O	O			
- Project or programme Finance plan	3 y		O	O	X	Committee + Engineer	O	O	O		Investment and running cost	
- Budget (investments and running)	1 y			O	X		O	O				
- Operation plan	1 y			O	X	Com. + Engi.	O	O				
- Cash flow plan	1 y				X		O				Not in small projects	
<b>ORDINARY BOOKKEEPING</b>												
- Financial opening balance	1 y			O	X	Treasurer	O			Committee	Balance sheet forms	Begin of financial year
- Inventory of investment and equipment	1 y			O	X	Committee + Engineer	O			Committee		
- Cash book					X	Treasurer	O			Secretary	Book	
- Bank book - current					X	Treasurer	O			Secretary	Book	
- Bank book - investment					X	Treasurer	O			Secretary	Book	
- Petty cash account I					X	Treasurer				Secretary		revolving accounts of about
- Petty cash account II					X	Caretaker				Treasurer		20 - 30 % US \$ only
- Other accounts ° Donors account ° Running costs, general expenses ° Salaries, wages ° Vehicles, running ° Investment, equipment ° Others according needs					X	Treasurer	O			Secretary	Account forms	Treasurer is accompanied by one nominated committee member (assistant)
- Financial result of the year ° Financial balance	1 y				X	Treasurer	O	O		Auditors	Balance sheet forms (assets + liabilities at a particular time are grouped under headings*)	End of financial year / annual accounts Income and expenditure (profit and losses) Amounts owed, depreciations, etc. are adjustments to be shown * e.g. fixed assets (reasonably valued), current assets (realisable in cash within a short period), longterm liabilities, current liabilities (should include all amounts due for payment or which may be called in at any time), reserves. All together = net value of the project
° Inventory of investment and equipment					X	Treasurer, caretaker	O	O				
<b>PARTICULAR ACTIVITIES / TASKS</b>												
- Rate collection					X	Rate collector				Treasurer	- Cash book for collector - Receipt vouchers	
- Stock management					X	Caretaker				Treasurer	- Stock cards - Stock entry vouchers - Stock out vouchers	
- Economic activities / fund-raising campaigns				O	X	All	O	O				
<b>RECORDING / REPORTING / INFORMATION / COOPERATION</b>												
- Auditing	1 y				O	Treasurer and assistant member			min. 2 Auditors*	Gen. Assembly	Formal auditing report	* Independent elected auditor, one professional End of financial year; special occasions
- Monthly financial record	1 m				X	Treasurer				President	Form	Reference to cash flow plan or budget
- Annual account	1 y											See above
- Yearly financial report	1 y				X	Treasurer + President				Gen. Assembly	Formal report	Part of annual report
- Recording rate collection	1 m				X	Rate collector				Treasurer	Collector's cash book	With remarks column
- Contacts / cooperation with Community	frequent				X	Committee				Community	Meetings	
- Contacts / cooperation with bank, cooperative	frequent				X	Treasurer			Assistant member	President	- Frequent contacts - vouchers	
- Contacts / cooperation with donors	sporadic				X	President				Committee	- Letters - Bookkeeping documents	

Table 15:

*Financial planning and financial management in infrastructure projects*

APPENDIX M. 9

Village / project: ..... Dates: .....

.....

Division: .....

Responsible persons for Monitoring: .....

.....

.....

.....

No	SECTORS, PARTS, INDICATORS	Rating	5	4	3	2	1
00	MOTIVATION AND PARTICIPATION						
01	Clean water is highly valued by the users						
02	Users show interest in water scheme						
03	Users pay water rates, collected by committee						
10	PERFORMANCE OF WATER MAINTENANCE COMMITTEE						
11	WMC is functioning and active						
12	WMC is integrated in existing village structure						
13	WMC and caretaker's duties are clearly defined and known						
20	FUNCTIONING AND SERVICE LEVEL OF SCHEME						
21	Catchment						
22	Water tanks, chambers						
23	Slow sand filters, other filters						
24	Public standpipes and wash places						
25	Pipelines with valves and chambers						
30	PROTECTION OF CATCHMENT AREA						
31	Catchment area is well protected						
32	Soil erosion in watershed and intake area is under control						
40	WATER QUALITY / QUANTITY / ACCESSIBILITY						
41	Water is clean, appearance of water born diseases reduced						
42	Water quantity is enough for bathing and washing clothes						
43	Enough taps well distributed all over the village						
50	SOCIAL ASPECTS AND WOMEN'S PARTICIPATION						
51	Nobody is affected in a negative sense by the scheme						
52	Women participate in O+M activities						
53	Women are in WMC key positions						
60	MAINTENANCE PROGRAMME IMPLEMENTATION						
61	Concept and importance of O+M is clear to villagers						
62	Finance scheme of O+M is established and functioning						
63	Funds available for spare parts and CT's compensation						
64	Figures for income and expenditure available (transparency)						
65	Regular monitoring by CDD or NGO technicians						
66	Monitoring data is complete for evaluation						
70	PERFORMANCE OF CARETAKER (CT)						
71	CT is trained						
72	CT is working well						
73	CT is compensated for his work						
74	CT has complete toolbox						
75	CT has enough spare parts on site						
76	CT has the necessary transport means						
	TOTAL						

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Rating: above 110 = very good, 80 – 109 = good, 60 – 79 = fair, 35 – 59 unsatisfactory  
below 35 = poor

Table 16: *Monitoring and rating for water supply projects – an example from Cameroon*

APPENDIX M. 10

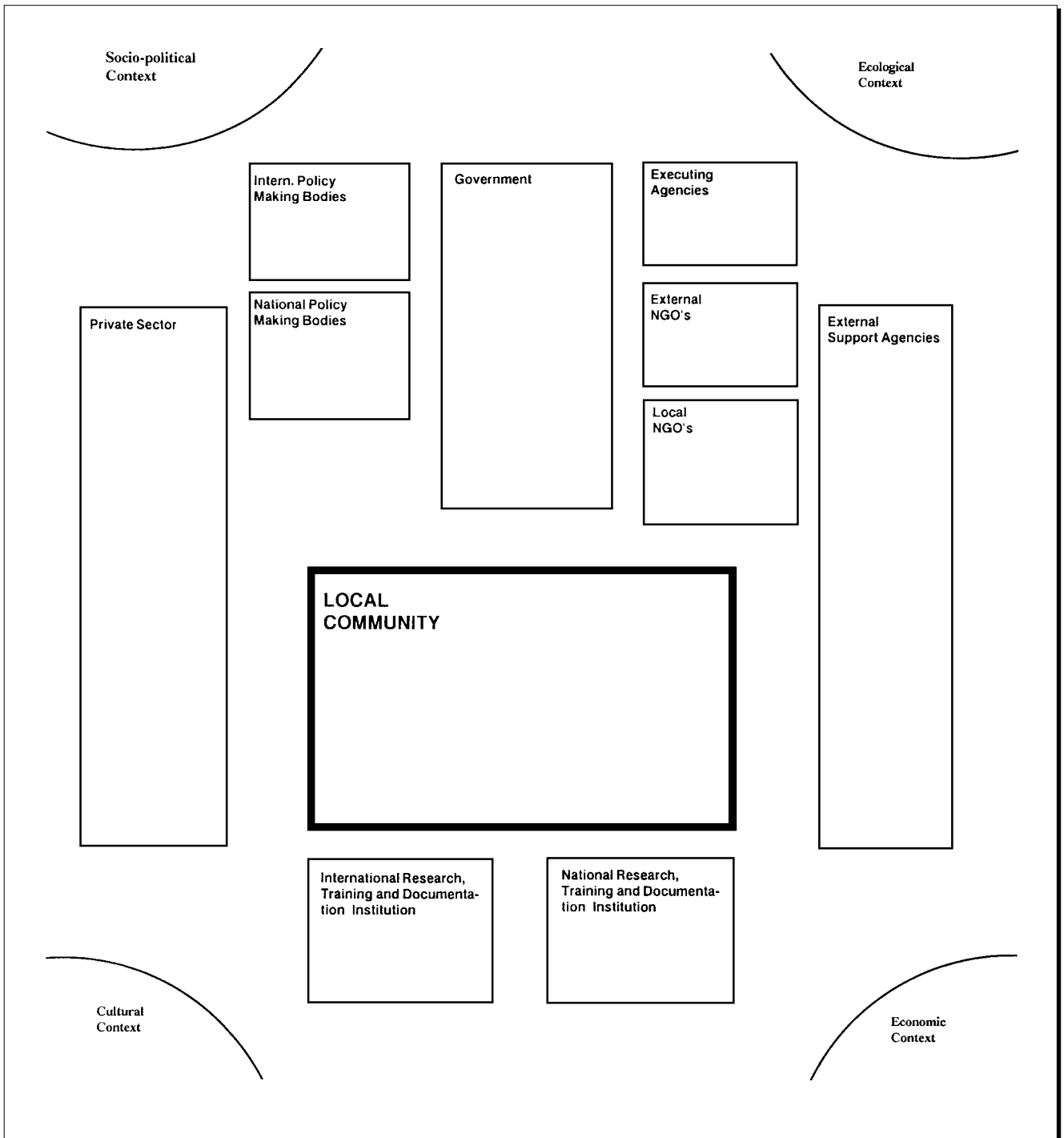


Figure 29: The water and sanitation knowledge system, WSKS [29]

APPENDIX M. 11

	Project items, steps	Who? Main actors	Output	Remarks (see chapter .....)
	<b>Ⓐ Project Idea, vision</b> (incl. actors profile)	(potential) <u>users</u> ( NGO, GO)	<ul style="list-style-type: none"> <li>Informal, spontaneous</li> <li>Visions, ideas</li> <li>Applications</li> <li>Resolutions</li> <li>Project committee</li> </ul>	(A2; 3) (1.3; 3.2; 3.4; 3.7) (C1; 5.2)
	<b>Ⓑ Assessment of context</b> <ul style="list-style-type: none"> <li>B1) Global context</li> <li>B2) National context</li> <li>B3) Local context</li> </ul>	Global players (international org.)  National level authorities (GO, NGO)	<ul style="list-style-type: none"> <li>Guidelines</li> <li>Sector orientation</li> <li>(Synergies)</li> <li>Sector report</li> </ul>	(A1.1; B2.1)  (2.2)
	<b>Ⓒ Objectives, main strategies</b> <ul style="list-style-type: none"> <li>C1 National level</li> <li>C2 Local level (project)</li> </ul>	As B2, plus users  As B3	<ul style="list-style-type: none"> <li>Support</li> <li>Sector objectives</li> <li>Sector policy, strategy</li> <li>Project objectives and targets</li> <li>Project policy</li> <li>Organization</li> </ul>	(2.3; 2.5; 2.6)  (3.3; 3.5)
	<b>Ⓓ Evaluation of context</b> <ul style="list-style-type: none"> <li>D1 National level</li> <li>D2 Local context</li> </ul>	As B2, plus users As B3	<ul style="list-style-type: none"> <li>Sector analysis</li> <li>Evaluation report (potential and problems)</li> </ul>	(2.4) (3.4)
	<b>Ⓔ Feasibility study</b>	NGO, local GO, users, project manager	<ul style="list-style-type: none"> <li>Feasibility study (various options)</li> <li>Recommendations</li> </ul>	(3.6)
	<b>Ⓕ Stakeholder's responsibilities and duties</b> (Water and sanitation knowledge system WSKS)	As E	<ul style="list-style-type: none"> <li>WSKS (duties, competencies)</li> </ul>	(1.3; 3.7)
	<b>Ⓖ Informed choice of option</b>	Users; as F	<ul style="list-style-type: none"> <li>Minutes</li> <li>Formal decision</li> <li>Agreement</li> </ul>	(3.8)
	<b>Ⓗ Design</b> <ul style="list-style-type: none"> <li>Organization / Management</li> <li>Technical drawings</li> </ul>	Project engineer Project manager Project committee	<ul style="list-style-type: none"> <li>Project documentation</li> <li>Organization manual</li> </ul>	(4.2; 4.3) [Vol.2; 8.2]
	<b>Ⓙ Final decision</b> (Yes / No)	<u>Users + donors + GO</u>	<ul style="list-style-type: none"> <li>Minutes</li> <li>Agreement</li> </ul>	(3.8; 4.2)
	<b>Ⓚ Implementation / construction</b>	As H	<ul style="list-style-type: none"> <li>Structures, buildings</li> <li>Programmes</li> <li>Reports, plans</li> </ul>	(4.3 – 4.5)
	<b>Ⓛ Final inspection / commissioning</b>	As H	<ul style="list-style-type: none"> <li>Final documentation</li> <li>Guarantee</li> <li>User instruction</li> </ul>	(3.5; 3.8; 4.3)
	<b>Ⓜ Operation and maintenance</b> (including follow up)	Users, project committees  Ⓝ	<ul style="list-style-type: none"> <li>Monitoring / reporting</li> <li>Reliable services</li> </ul>	(5)

Figure 12: Project cycle – diagram

## APPENDIX M. 12

LEVEL	OBJECTS	TOOLS GUIDELINES	PARTICIPANTS
General planning	Development policies	<ul style="list-style-type: none"> <li>- Statutory decree</li> <li>- Donors committee</li> <li>- Conferences</li> <li>- Multilateral commitments</li> </ul>	<ul style="list-style-type: none"> <li>- National councils, parliaments, ministries</li> <li>- Bilateral donors</li> <li>- International organizations</li> </ul>
	Institutional planning	<ul style="list-style-type: none"> <li>- Guiding image, general comprehensive policies</li> </ul>	<ul style="list-style-type: none"> <li>- National departments</li> <li>- Possibly other authorities</li> </ul>
	Operational framework planning	<ul style="list-style-type: none"> <li>- National announcements, special committees</li> </ul>	<ul style="list-style-type: none"> <li>- Implementing agencies, private organizations</li> <li>- Other authorities</li> </ul>
Specific planning	Organizational development	<ul style="list-style-type: none"> <li>- Working groups training / further training concepts; information policy</li> </ul>	<ul style="list-style-type: none"> <li>- Advisor, consultants</li> <li>- Implementing agencies; NGOs,</li> </ul>
	Country planning	<ul style="list-style-type: none"> <li>- Country programmes</li> </ul>	<ul style="list-style-type: none"> <li>- Implementing agencies; consultants</li> </ul>
	Sector planning (see 3.2)	<ul style="list-style-type: none"> <li>- Sector guidelines; sector policies / sector programmes; cross-section analysis</li> </ul>	<ul style="list-style-type: none"> <li>- Sector services; consultants; sections / services; implementing agencies</li> </ul>
Specific strategies	Section planning	<ul style="list-style-type: none"> <li>- Midterm planning; strategies and principles</li> </ul>	<ul style="list-style-type: none"> <li>- Sections and services of national GOs and NGOs</li> <li>- Private sector</li> </ul>
Planning of measures, projects and programmes	Operational planning of sections and services	<ul style="list-style-type: none"> <li>- Annual programmes sectors / countries; continuous planning; personnel planning; self-evaluation</li> </ul>	<ul style="list-style-type: none"> <li>- Sections and services; consultants (NGOs and private sector)</li> </ul>
Concrete, local programmes / projects	Phase planning of projects and programmes (2 – 5 years) (see 3.5)	<ul style="list-style-type: none"> <li>- Project / programme committee (credit proposals and requests; appraisals; studies; workshops, etc)</li> </ul>	<ul style="list-style-type: none"> <li>- Programme officers; coordination officer; implementing agencies; consultants</li> <li>- Partner governments; partner organizations</li> </ul>
	Operational planning of projects / programmes (1 year) (see 3.6)	<ul style="list-style-type: none"> <li>- Various instruments (in particular annual plans; budget and personnel planning)</li> </ul>	<ul style="list-style-type: none"> <li>- Partner organizations; users; project personnel; programme officers; coordination offices, implement. agencies</li> </ul>

Table 18:

*The variety of planning tools / guidelines*

## APPENDIX M. 13

Step	Conditions	Tools to structure procedures or to facilitate planning processes (see Appendix F and G)
1. <u>Vision(s), preparation of planning</u>  What does exist?  What do we (not) want?  What do we need?  Environmental conditions (resources, impact)	Awareness, concern, intuition, pleasure in experimenting, preparedness to dialogue, change and challenge	<u>Participatory appraisal elements (PRA)</u> , <u>SWPO</u> , sketches, drawings, mind-mapping, notes, letters, tape recordings, qualitative assessments, action research
2. <u>Possibilities of changes</u>  Ideas ripen, are discussed; prioritisation of ideas; exchange with external advisors	Creativity, fantasy, imagination, models	Brainstorming forms, creative process facilitation analogies, role playing, visits, future workshops (utopia phase), scenario writing; <u>GOPP steps</u> , PRA elements, action research, anecdotes, stories, photographs, invitations.
3. <u>Options</u>  Evaluation of alternatives in view of: <ul style="list-style-type: none"> <li>- institutional capacity (O+M, WTP)</li> <li>- short- and long-term effects,</li> <li>- costs,</li> <li>- duties and benefits for users and for others,</li> <li>- outside support,</li> <li>- mutual decisions</li> </ul>	Sense of reality and ownership, community spirit, skill in negotiating	Assessments, action research, <u>GOPP steps</u> , benefit analysis, morphology, PRA elements, <u>SWPO</u> , future workshop, (phase of realisation), evaluation, environmental impact, brainstorming, role-playing, visualisation.
4. <u>Phase Planning</u> (Development of a concept and strategy on different levels):  Institutions, co-operation, internal and external relations, frame conditions, main activities, costs, competence, project documentation	Trust, assignment of long-term responsibilities to the users right at the beginning, knowledge of environment, perseverance, demand-responsiveness, local ownership	Conditions laid down by country programmes, regional development and sector plans, credit requests and proposals. <u>Project planning overall view (out of GOPP)</u> , <u>flow charts</u> , <u>SWPO</u> .  At community level: negotiation through meetings, visualisation, PRA-elements, project visits, role-playing etc.
5. <u>Operational planning</u>  Detailed design, technical documents, operation plan (mid- and short term), institution building and HRD	Sense of what is possible, feeling for human and institutional potentials, skills in transferring into action (design and implementation), a talent for organisation	<u>Project planning overall view (out of GOPP)</u> , diagram of functions, <u>bar charts</u> , budget, discussions, list of duties, role and job descriptions, diary of operations, organigram, buying plan, visualisation, <u>brainstorming</u> , permanent future workshops. (see 4.3, tools for implementation)
6. <u>Periodical adaptation of plan</u> (small MEPI-cycle)  Monitoring, evaluation and steering  Adjustment of planning	Readiness to learn, ability to criticise, imagination, ability to observe, discipline to reflect	Self-evaluation, external evaluation, open questions, key indicators, action research, regular working meetings, retreats, <u>SWPO</u> , studies, opinion polls, PRA steps, brain-storming, creative process, facilitation. Environmental impact monitoring.

Estimation of influencability and reality check according to Figure 28.

Table 20: A view of planning steps, conditions and respective tools





## APPENDIX M. 15

SECTOR	OBJECTIVES, RESULTS	ACTIVITIES	INDICATORS	RESOURCES, RESPONSIBILITIES
<b>INSTITUTION BUILDING AND HUMAN RESOURCES DEVELOPMENT</b> <ul style="list-style-type: none"> <li>Regional commit. sub-committees, representing Bambui, Bbanki farmers and Sabga graziers</li> </ul>	<ul style="list-style-type: none"> <li>Autonomous and capable watershed committees;</li> <li>Participation of all beneficiaries incl. women.</li> <li>Improved farmer's skills for land and crop management</li> </ul>	<ul style="list-style-type: none"> <li>Information</li> <li>Sensitisation</li> <li>Animation, promotion</li> <li>Training of promoters and farmers</li> </ul>	<ul style="list-style-type: none"> <li>Existence and functioning of committees</li> <li>Number and type of projects; area under control (% of total watershed area)</li> <li>Participation of beneficiaries , (% of number of farmers)</li> </ul>	HELVETAS SAP (other NGOs) WATERSHED COMMITTEES
<b>CONSERVATION OF INDIGENOUS FORESTS,</b> <ul style="list-style-type: none"> <li>All areas, especially along watercourses</li> </ul>	<ul style="list-style-type: none"> <li>Reduce deforestation and stabilize forest cover</li> <li>Conserve biodiversity</li> <li>Protect animals</li> </ul>	<ul style="list-style-type: none"> <li>Sensitisation</li> <li>Information on alternatives to forest farming</li> <li>Monitoring of forest areas</li> <li>Control of hunting and trapping</li> </ul>	<ul style="list-style-type: none"> <li>Area monitored and under control (% of total forest area, % of farmers sensitised and practicing forest farming methods)</li> </ul>	SAP (other NGOs) WATERSHED COMMITTEES, PROMOTERS
<b>AGRO-FORESTRY PRODUCTION</b> <ul style="list-style-type: none"> <li>To replace seasonal shifting cultivation *</li> </ul>	<ul style="list-style-type: none"> <li>Introduce AF as viable alternative to slash and burn seasonal farming (hedgerows, alley cropping, live fences, fodder and manure trees)</li> </ul>	<ul style="list-style-type: none"> <li>Sensitisation</li> <li>Information</li> <li>Training</li> <li>Demonstration, Implementation on farms, plant nurseries,</li> <li>Outplanting, monitoring</li> </ul>	<ul style="list-style-type: none"> <li>Attitude of farmers towards AF practices (% of farmers who changed to AF practices, area under AF land use), number of trees planted</li> </ul>	SAP (other NGOs) WATERSHED COMMITTEES, PROMOTERS, FARMERS
<b>SOIL &amp; WATER CONSERVATION</b> <ul style="list-style-type: none"> <li>On agricultural and grazing land</li> </ul>	<ul style="list-style-type: none"> <li>Erosion control in water intake and agricultural areas</li> </ul>	<ul style="list-style-type: none"> <li>Contour farming</li> <li>Green manuring</li> <li>Reforestation and grass planting for soil stabilization and protection belts</li> </ul>	<ul style="list-style-type: none"> <li>Attitude of farmers towards SC practices, (% of farmers who changed to SC practices), area restored</li> </ul>	SAP (other NGOs) WATERSHED COMMITTEES, PROMOTERS, FARMERS
<b>PASTURE IMPROVEMENT</b> <ul style="list-style-type: none"> <li>On Fulani grazing land **</li> </ul>	<ul style="list-style-type: none"> <li>Increased fodder production</li> <li>Night paddocks</li> <li>Controlled grazing</li> </ul>	<ul style="list-style-type: none"> <li>Establishment of pasture plots</li> <li>Inputs for protection and maintenance</li> </ul>	<ul style="list-style-type: none"> <li>Area established, % of graziers involved in pasture improvement</li> <li>Level of inputs</li> </ul>	SAP (other NGOs) GRAZIERS
<b>WOODLOTS</b> <ul style="list-style-type: none"> <li>Away from water courses</li> </ul>	<ul style="list-style-type: none"> <li>Income generation</li> <li>Reduction of pressure on indigenous trees</li> </ul>	<ul style="list-style-type: none"> <li>Selection of plots; suitable and establishment of woodlots</li> <li>Monitoring</li> </ul>	<ul style="list-style-type: none"> <li>Motivation</li> <li>Interest, labour input for establishment and maintenance</li> </ul>	SAP (other NGOs) WATERSHED COMMITTEES, PROMOTERS
<b>APPROPRIATE LAND USE AND SPATIAL ARRANGEMENT</b>	<ul style="list-style-type: none"> <li>Regulated land tenure and security</li> <li>Separation of grazing from farm land by creating buffer zones</li> </ul>	<ul style="list-style-type: none"> <li>Sensitisation</li> <li>Land allocation and demarcation</li> <li>Issuing land bonds</li> <li>Establishment of live fences and protection belts</li> </ul>	<ul style="list-style-type: none"> <li>Number of applications for land bonds distributed</li> <li>Fences and other permanent structures established</li> </ul>	TRADITIONAL COUNCILS, WATERSHED COMMITTEES, PROMOTERS

\* Hardwood, soil improving species, fruit trees, medical plants

\*\* Kikuyu, Bracharia, Guatemala grass, fodder legumes

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Table 22:

*Watershed management – supportive measures for a rural water supply programme in Cameroon*

APPENDIX M. 16

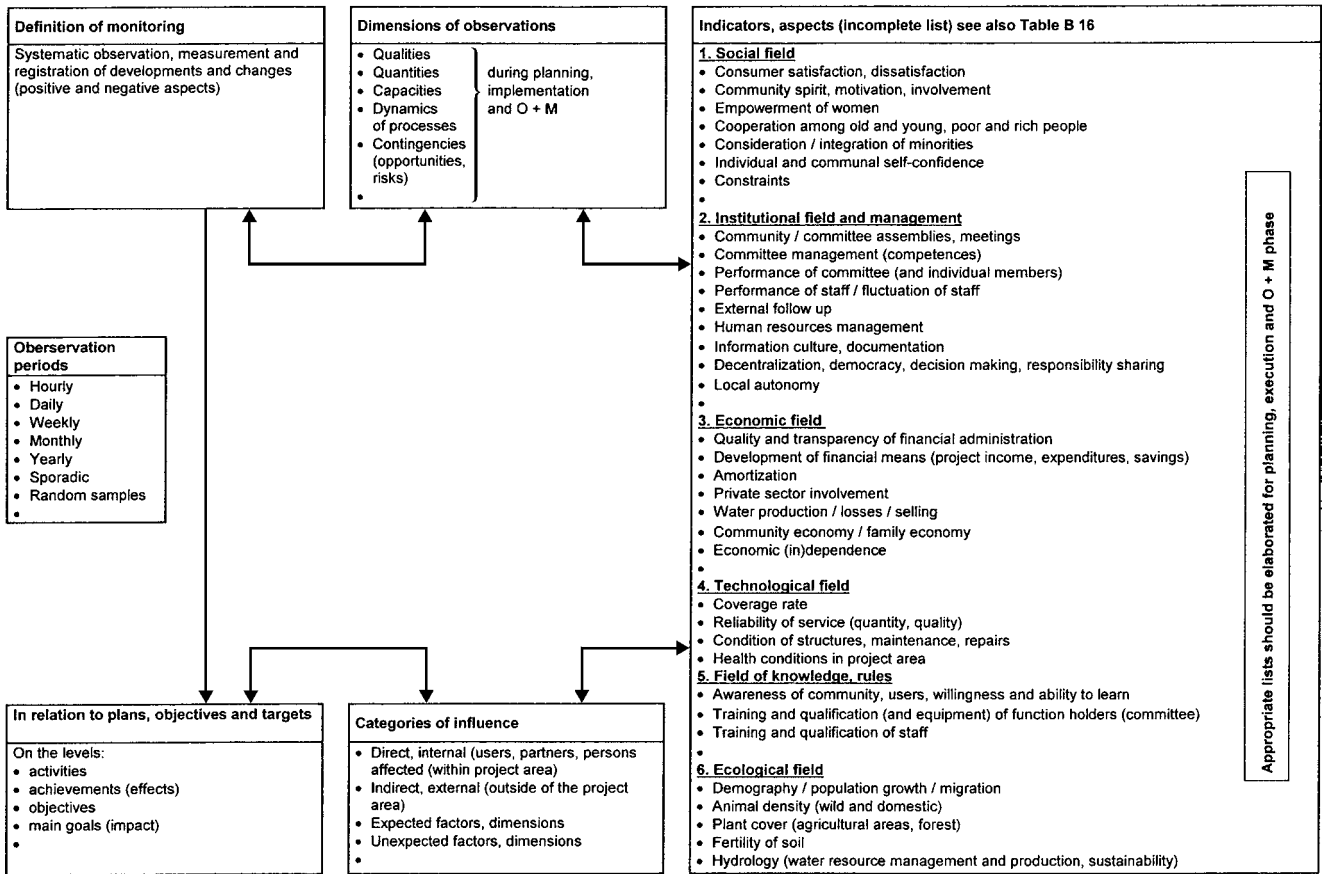


Figure 37

Basic elements of monitoring (example of Burkina Faso)

APPENDIX M. 17

**SWPO – a Rapid Evaluation Method**

**SWPO** is a method with a very simple structure to evaluate results, as successes and failures (Review of past activities), opportunities or potentials and threats or problems (Future perspectives). All the activities are set in order of hierarchy, from base to top or from community to institution.

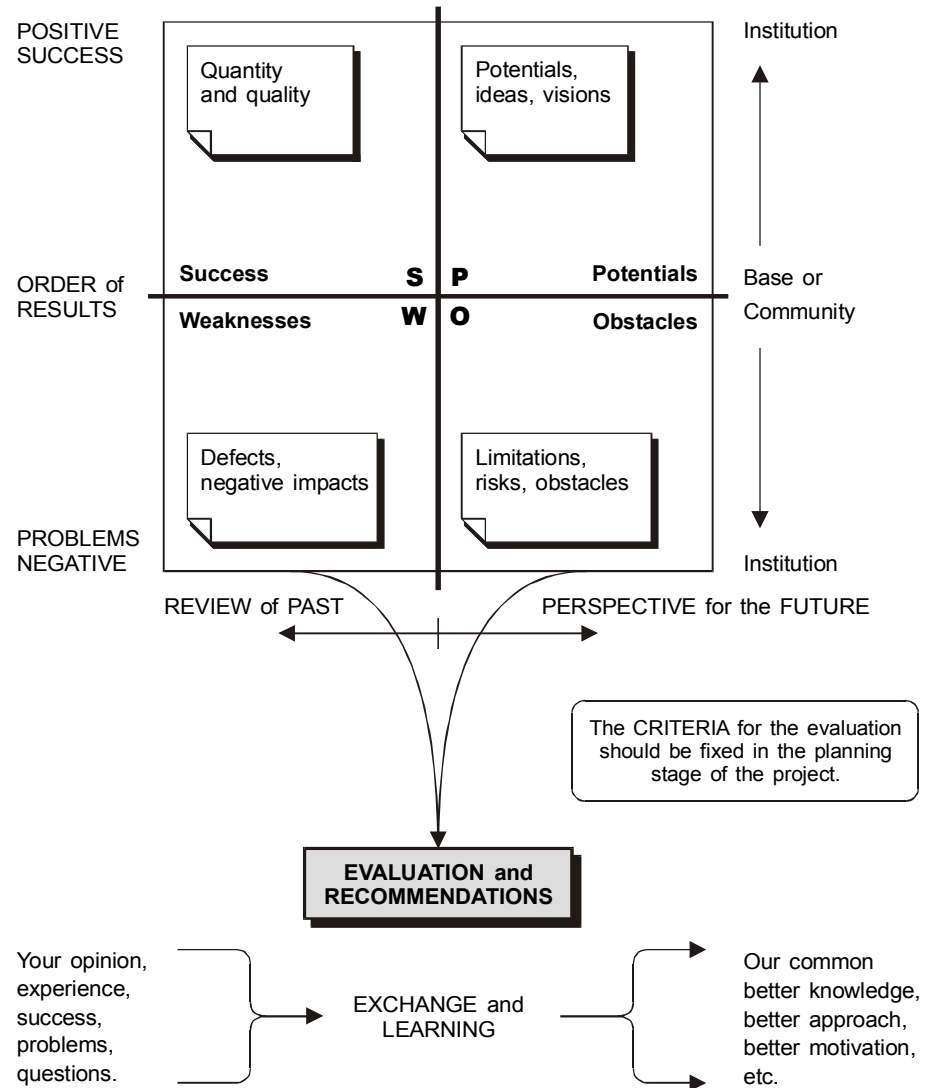


Figure 38: The SWPO method

## APPENDIX M. 18

Filing system	Tertiary files (horizontal combinations possible)		G GENERAL	DM DIOCESE MERU	MC MUKULULU CAMP	LC LARE CAMP	KS KANGETA SUPPLY AREA	LS LARE SUPPLY AREA	MS MUTUATY SUPPLY AREA
	Main files	Secondary files							
Administration General	01	General							
	02	Staff (see also F03, M03)							
	03	Legal matters (laws, court cases)							
	04	Information, public relations							
	05								
	06	Other water projects within TWS							
	07	Government contracts (MOWO)							
	08								
	09	Climatic data, water flows (natural)							
	10								
Development General	01	Generak (+ policy, visions)							
	02	Development coordination							
	03	Health, hygiene							
	04	Agriculture, erosion control							
	05	Social development							
	06	Schools, education							
	07	Population growth							
	08	Community mobilization							
	09								
	10								
Construction	01	General							
	02	Standards, regulations, laws							
	03	Projects general							
	04								
	05	Individual project files, main structures							
	06	Individual project files, local distribution							
	07								
	08								
	09								
	10								
Financial Administration	01	General							
	02	Project financing							
	03	Salaries (see also A02)							
	04								
	05	Water rates, tariffs							
	06	Sale of water							
	07	Budgets TWS							
	08	Bookkeeping TWS							
	09								
	10	Petrol station (see also O10)							
Meetings	01	General							
	02	TWS-Board							
	03	Staff meetings (see also A02)							
	04								
	05	Development meetings							
	06								
	07								
	08								
	09								
	10	Other meetings							
Operation Maintenance Repairs (incl. Monitoring)	01	General							
	02	Water statistics (production+ sale + free)							
	03	Consumer contacts							
	04	Intakes							
	05	Mukululu camp + workshop + stock							
	06	Lare Camp + stock							
	07	Distribution							
	08	Storage							
	09	Vehicles and houses							
	10	Petrol station (see also F10)							

Table 25:

Filing system - an example from Kenya

## APPENDIX M. 19

<i>Description</i>	<i>Verifiable indicators</i>	<i>Means of verification</i>	<i>Critical assumptions</i>
Development objectives			
Immediate objectives			
Main outputs			
Activities			
Inputs <ul style="list-style-type: none"> <li>■ Community</li> <li>■ Government</li> <li>■ Donors</li> <li>■ Training institutions</li> <li>■ Participants, students</li> </ul>			

**Table 28:** *Logical framework for HRD-activities (from GOPP/ZOPP)*

## APPENDIX M. 20

	Frontal teaching <b>A</b>	Individual working Partner work <b>B</b>	Discussions Meetings <b>C</b>	Group learning <b>D</b>	Demonstrations, Instruction, On-the-job training <b>E</b>	Excursions <b>F</b>
<b>"Rules of the game"</b>	<ul style="list-style-type: none"> <li>- Traditional method</li> <li>- Trainer in front, centre of attention</li> <li>- Trainer speaks, leads, controls</li> <li>- Media: blackboard, overhead projection, flipcharts</li> </ul>	<ul style="list-style-type: none"> <li>- Working alone or with one partner</li> <li>- Assignments must be clearly formulated (written form)</li> <li>- Trainer watches, helps when and where necessary</li> </ul>	<ul style="list-style-type: none"> <li>- One person is the moderator, the others participants</li> <li>- Debate, panel discussion, dispute</li> </ul>	<ul style="list-style-type: none"> <li>- Can be used to break the monotony of frontal teaching</li> <li>- After introduction forming of small groups</li> <li>- Assignments clearly formulated, written form</li> <li>- Individual group work</li> <li>- Selection of a group leader (moderator)</li> <li>- Clear time schedule</li> <li>- Results compiled and presented in plenary</li> </ul>	<ul style="list-style-type: none"> <li>- Step by step approach (each step needs teaching, practising, checking)</li> <li>- Enhancing trainees independence (learning by doing)</li> <li>- Make clear the key-points</li> <li>- Many activities need to be practised again and again</li> <li>- Theory and practice should go hand in hand</li> </ul>	<ul style="list-style-type: none"> <li>- One to one contact with institutions, construction sites, etc.</li> <li>- Excursions are part of the curriculum, linked to other teaching topics</li> <li>- The three important steps: <ul style="list-style-type: none"> <li>° Planning and preparation</li> <li>° Implementation</li> <li>° Final assessment (reports, evaluation)</li> </ul> </li> </ul>
<b>Advantages</b>	<ul style="list-style-type: none"> <li>- Appropriate for presentation of facts, problems, new information and theoretical know-how</li> </ul>	<ul style="list-style-type: none"> <li>- Stimulates independence of thinking (if trainees have a certain maturity)</li> </ul>	<ul style="list-style-type: none"> <li>- Good method for real work in daily life</li> <li>- Development of persuasive power</li> </ul>	<ul style="list-style-type: none"> <li>- Learning of interaction patterns and of team work</li> </ul>	<ul style="list-style-type: none"> <li>- High learning effect</li> </ul>	<ul style="list-style-type: none"> <li>- Link to other real work situations</li> </ul>
<b>Disadvantages (or conditions)</b>	<ul style="list-style-type: none"> <li>- Does not stimulate independent thinking and acting</li> <li>- Inappropriate for mediation of practical skills</li> </ul>	<ul style="list-style-type: none"> <li>- Requires highly qualified trainer</li> <li>- Must be combined with formal teaching lessons</li> </ul>	<ul style="list-style-type: none"> <li>- Not suitable for the mediation of comprehensive know-how and data</li> </ul>	<ul style="list-style-type: none"> <li>- Not suitable for the mediation of comprehensive know-how and data</li> </ul>	<ul style="list-style-type: none"> <li>- Method is time consuming. Requires careful preparation and guidance</li> <li>- Not suitable for mediation of complex know-how</li> </ul>	<ul style="list-style-type: none"> <li>- Time consuming</li> <li>- Expensive</li> <li>- Not suitable for mediation of comprehensive know-how</li> </ul>
<b>Main fields of application</b>	<ul style="list-style-type: none"> <li>- Theoretical subjects</li> <li>- Introduction to subjects</li> </ul>	<ul style="list-style-type: none"> <li>- Deepening of knowledge which has been taught earlier</li> </ul>	<ul style="list-style-type: none"> <li>- Planning sessions</li> <li>- Management sessions</li> <li>- Discussion of alternative solutions</li> </ul>	<ul style="list-style-type: none"> <li>- Deepening of knowledge which has been taught earlier</li> </ul>	<ul style="list-style-type: none"> <li>- Indispensable in teaching practical skills</li> </ul>	<ul style="list-style-type: none"> <li>- Useful for most topics</li> </ul>

**Table 27:** *Teaching methods*

## APPENDIX N

## SUMMARY TABLE OF TARIFF OPTIONS

	<i>What ?</i>	<i>When ?</i>	<i>What for ?</i>	<i>Who organizes ?</i>
Community fund raising	1) Voluntary funds	In communities with a tradition of fund-raising, seasonal income, good knowledge and control of payments according to household capacity	Financial contributions to construction; Occasional contributions to maintenance and repair of simple systems with public water points	Traditional leadership, voluntary organizations, e.g. women's groups, tap organizations
	2) General community revenue	In communities with own sources of income and a water supply with public facilities	Annual maintenance and repair, financial contributions to construction; depreciation and expansion where possible	Local government, community water committee or subcommittee
	3) Cooperative funds or community revolving funds	Water supply initiated and financed through production cooperative or village revolving fund; no direct payments for water consumption	Annual maintenance and repairs; repayment of construction loan; depreciation and expansion where possible	Cooperative's executive committee, community water committee or subcommittee
Regular user charges	4) Flat rates	Families have private taps, or share taps with well-defined social group, have fairly reliable incomes, and benefit more or less equally	Repayment of community loan for constructions; Annual maintenance and repairs; Depreciation and expansion where possible	Water committee or subcommittee board of water users cooperative, local government, tap users' committee
	5) Graded rates	In communities with appreciable differences in water use and benefits and sufficient community spirit to divide user households into different payment categories	Repayment of community loan for constructions; Annual maintenance and repairs; Depreciation and expansion where possible	Community water organization with, support from promoters or other social experts assisting the project agency
	6) Mixed systems	In communities with large differences in payment capacity and water use, with high and low income households living in separate sections	Repayment of community loan for constructions; Annual maintenance and repairs; Depreciation and expansion where possible	Water agency with community water committee or subcommittee
	7) Water metering	In large communities with limited water resources and an efficient administration	Repayment of community loan for constructions; Annual maintenance and repairs; Depreciation and expansion where possible	Water agency and/or community water organization
Water vending	8) Vending instead of a piped distribution network	In communities where a socially valuable vending system can be improved, where other solutions are technically, economically or politically impossible	Contribution towards financing of the recurrent costs of the agency; Financing of vendor service costs, including upkeep of hygiene and simple repairs	Water agency with paid operators, women's groups or water sellers' cooperative
	9) Vending as part of a piped distribution network	In communities where group connections or cross subsidies between private and public taps have not worked	Contribution towards financing of the recurrent costs of public taps and the service of the vendors, including upkeep of hygiene and simple repairs	Water agency with paid operators or socio-economically appropriate concessionaires, e.g. women heads of households
Taxes	10) Direct or indirect water taxes	In communities where the transfer of sufficient funds to the water organization is assured and taxation can be related to water use and costs	Annual maintenance and repair; repayment of construction loan; depreciation and expansion where possible	Local government service organization for a specific area, e.g. a low-cost housing scheme

Table 30:

Summary table of tariff options



<i>How ?</i>	<i>Conditions</i>	<i>Advantages</i>	<i>Weak points</i>
Targets are set and funds collected periodically through meetings, house-to-house collections, bazaars, etc. collection in advance or when required	<ul style="list-style-type: none"> <li>■ Optimal social control</li> <li>■ Good for small projects</li> <li>■ Caretakers' remuneration in kind</li> </ul>	<ul style="list-style-type: none"> <li>■ For people with seasonal income</li> <li>■ Minimum organization</li> </ul>	<ul style="list-style-type: none"> <li>■ Sum uncertain</li> <li>■ No link with consumption</li> </ul>
Reservation of funds based on the estimated costs and net annual income of the community	<ul style="list-style-type: none"> <li>■ All households should have ± equal access to water, ± the same interest on water</li> </ul>		<ul style="list-style-type: none"> <li>■ Income for water depends on another enterprise; high risk, if there is only one source of income</li> </ul>
Reservation of funds based on estimated costs and income from cooperative ventures and/or member fees; cost-reduction or income generation where necessary	<ul style="list-style-type: none"> <li>■ Starting capital from government or from individual shares. Number of shares per household should be limited (to avoid wealth and power accumulation)</li> <li>■ Strong leadership, high village motivation, social control</li> <li>■ Diversified projects (risk distribution)</li> <li>■ Compensation for fund managers and external inputs</li> </ul>	<ul style="list-style-type: none"> <li>■ Cooperative start with various small projects; with growing experience they enter bigger projects</li> <li>■ Various kinds of projects (individual and communal) are possible</li> <li>■ Positive experience in various cases</li> </ul>	<ul style="list-style-type: none"> <li>■ Extensive regulations</li> <li>■ Works only in small, homogeneous communities</li> </ul>
Project agency advises on initial rate for approval by users; rates are collected and administrated by the local water organization	<ul style="list-style-type: none"> <li>■ Fixed amount per household: payment per month or seasonally</li> <li>■ Similar benefits for all families; additional consumption should be charged</li> <li>■ Group connection fee for neighbours sharing a yard tap</li> </ul>	<ul style="list-style-type: none"> <li>■ Good system for private taps or group connections</li> <li>■ Regular and direct water charges can be more easily related to water use and to effective costs</li> <li>■ Complex meter system avoided</li> </ul>	<ul style="list-style-type: none"> <li>■ On public stand posts the more distant families are disadvantaged</li> <li>■ Pressure on low income households</li> </ul>
Private tap owners are classified in high and low rate categories, using local indicators of water use and wealth; users sharing taps may pay lower or equivalent individual rates	<ul style="list-style-type: none"> <li>■ Graded rates according <ul style="list-style-type: none"> <li>- anticipated consumption</li> <li>- income (salary earners, etc.)</li> <li>- type and size of living houses</li> <li>- number of families per tap (conflicts!)</li> <li>- productive use of domestic water</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>■ Possibility to take into account the different financial capacities of men and women or particular family responsibilities (social tariff)</li> <li>■ Separate tariffs for animals' consumption</li> </ul>	
Surpluses or private taps are used to finance the costs of free public taps in poorer sections	<ul style="list-style-type: none"> <li>■ Clear indicators, agreed by the community, are needed</li> <li>■ Payment possible in form of cash crops (advantage: revenue is linked to raising costs)</li> </ul>	<ul style="list-style-type: none"> <li>■ Accounting the consumption without having the metering problems</li> </ul>	
Meter reading, billing and rate collecting by separate workers, or payment through banks, at central government offices or local branches	<ul style="list-style-type: none"> <li>■ The installation of metered group connections is an option for urban areas: 20 to 30 families together form a tap user group</li> <li>■ Each private connection has a separate meter.</li> </ul>	<ul style="list-style-type: none"> <li>■ Charging according to volume used, helps to avoid water wastage</li> <li>■ Such direct charges can be more easily related to effective costs</li> <li>■ Different types of water charges are possible, e.g. progressive rates</li> </ul>	<ul style="list-style-type: none"> <li>■ Metering raises the costs of water supply considerably</li> <li>■ High demand on administrative capacities of the water supply management</li> <li>■ Meters can be subject to technical problems (in small villages not appropriate)</li> </ul>
Water is sold from metered taps at controlled price; when buying is subsidized, selling prices may equal private rates, the difference forming the vendors' income		<ul style="list-style-type: none"> <li>■ Direct payment on the spot in the moment of collection</li> <li>■ Income for water vendors</li> <li>■ With kiosks better hygienic conditions, less vandalism</li> </ul>	<ul style="list-style-type: none"> <li>■ Vendors need to be remunerated (considerable water price increase)</li> <li>■ High price and low service level</li> <li>■ In times of shortage consumers are vulnerable to exploitation</li> </ul>
Water is sold from metered taps at controlled price; when buying is subsidized, selling prices may equal private rates, the difference forming the vendors' income			<ul style="list-style-type: none"> <li>■ Coin-operated taps are not recommended because of their great sensitivity to breakdown and interference</li> </ul>
Taxes are used exclusively for financing one or several basic services; categories of payment are based on level of service or housing conditions	<ul style="list-style-type: none"> <li>■ Where local government is functioning, indirect taxation is the most simple system</li> <li>■ Justified only where all houses have the same service level (or when taxes depend on house hold economy?)</li> </ul>		<ul style="list-style-type: none"> <li>■ Water wastage</li> <li>■ Transfer of funds from the agency to the water organization could be difficult</li> </ul>

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