Water and Sanitation Knowledge System

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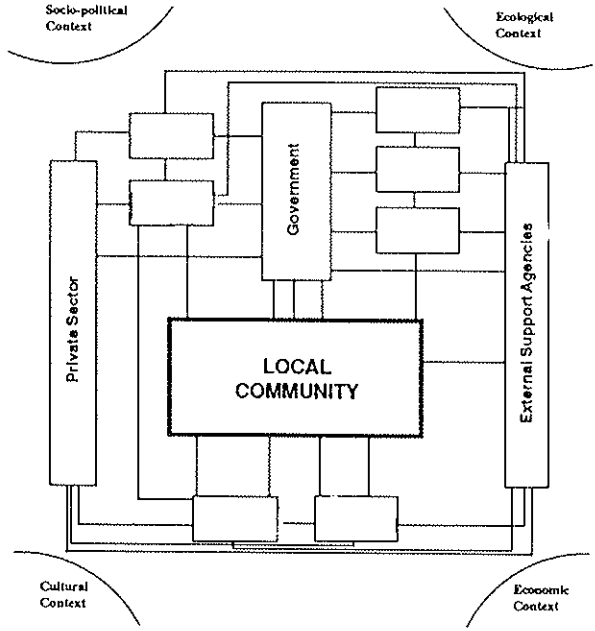
Table of contents

1. Introduction

The present Water and Sanitation Knowledge System is the result of an intensive exchange and collaboration among leading specialists in the field of Water Supply and Sanitation during the 8th Workshop of the AGUASAN[1] Group in Gersau in 1992.



[1] Since 1983, AGUASAN has been the interdisciplinary coordination group of the technical services attached to the W+S sector of the Swiss Development Cooperation - SDC. Its members are collaborators in the following institutions: IRCWD/EAWAG, Helvetas, Swiss Federal Institute of Technology in Zurich and Lausanne, Zurich University, Swiss Centre for Development Cooperation in Technology and Management (SKAT), WHO, and SDC.
During the annual AGUASAN Workshop, project collaborators exchange experience on topical problems in the fields of water supply and sanitation.

Based on the participants' multiple project experience a useful and simple model has been developed to show the important actors and relations in a specific project or programme. It describes the processes of knowledge transfer and learning and identifies key positions and bottle necks in the network of complex relations.

The WSKS is a useful working instrument that can be employed in all phases of a project, i.e. planning, evaluation, monitoring and implementation. It serves as a tool to deal with and recognize two basic questions of a project layout:

- Who are the actors in the project, and what are the relationships between them?
- Who are the key actors in this network of relationships?

The WSKS is like a snapshot of an actual project situation with a main emphasis on the structural conditions. The model serves as a thought pattern and makes possible a systematic ordering of the different interests and actors in a W and S project/programme, starting with a geographical compartmentalization of the actors.

The use of the WSKS compels a systematic procedure and calls for a clear classification of the actors. It allows to observe the project/programme as a whole, and permits also to look closer at specific subdivisions.

2 The starting point: Water and Sanitation Projects are of complexe nature

2.1 Water and Sanitation are issues of global dimensions

Drinking water in sufficient quantity and quality is one of the most basic human needs. Both, the quantity and quality of available water are an expression and an indicator of the ecological context. Progressive deterioration of the environment, and settlement concentration lacking environmentally adequate waste and excreta disposal, hinder the direct access to sufficient and clean water. At the beginning of the 1990s, over one billion people had no access to safe drinking water. About 1.7 billion lack sanitation facilities. In developing countries, 15 million infants die every year due to contaminated drinking water, lack of hygiene and malnutrition. The WHO estimates that about 80% of all cases of illness are directly connected with insufficient water supply and sanitation. [1]

2.2 Water and Sanitation projects/ programmes require local participation

The permanent availability of sufficient clean drinking water for all should be the objective of projects and programmes in the field of W&S. Sanitation

measures must be designed for the largest possible coverage.

The following principles must guide their implementation. We need:

- a comprehensive management of water resources, as well as of liquid and solid waste to contribute to the protection of health and the environment,

- institutional reforms to promote a holistic approach - including modifications as regards procedures, habits and behaviour -, as well as a full participation of women at all institutional levels of the sector,

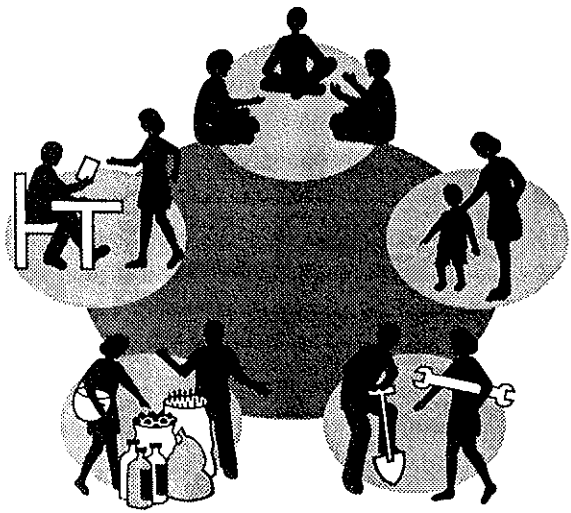
- the operation of W+S installations through local communities and promotion of measures aimed at reinforcing the local institutions in the planning and implementation of sustainable W+S programmes,

- an improved use and management of existing installations through application of managerial principles and consistent use of appropriate technologies.

2.3 The demand for a balanced development

The strategy for a balanced development in W&S projects is described in the Sector Policy of the Water and Sanitation Sector of SDC.

Use of drinking water, disposal of liquid and solid waste and hygiene behaviour of the population, are all part of the sociocultural and natural context. The strategy of a balanced development takes into account these important contextual conditions. It shows adequate solutions for the development, implementation and operation of balanced and sustainable W+S systems based on a holistic understanding of W&S programmes embedded in their sociocultural and natural environment. The strategies of balanced development demands a harmonious consideration of five interconnected fields, all of which interact towards sustainability of W+S systems.



- *The social field covers aspects of motivation for W+S measures and the active participation of users in decision and implementation processes.*

Important aspects:
- Motivation and participation of all parties involved are decisive.
- Genuine needs and local structures are fundamental.
- Women's participation depends on the elimination of obstacles.

- *The institutional field implies the division of tasks between Government, other institutions and the community.*

Important aspects:
- Efficiency and transparency between all partners will result in synergies.
- The institutional capacities of the various actors need to be strengthened by participative processes.

- *The economic field covers aspects of financing and resource management.*

Important aspects:
- The beneficiaries must get tangible advantages from water projects.

- Cost recovery depends on a long-term realistic sharing of costs.
- Resource management contributes to preserving limited resources.

- *The technological field covers aspects of technical W+S supply installations.*

Important aspects:
- A reliable and sustainable W+S infrastructure depends on:
  - appropriate technology;
  - promotion of local construction;
  - avoidance of new risks.

- *The field of rules & regulations and knowledge & skills covers aspects of rights and responsibilities, as well as of training and transfer of know-how within W+S programmes.*

Important aspects:
- Sustainability depends on:
  - the ability to solve problems;
  - the strengthening of available knowledge through new competence;
  - the promotion of research and exchange of experiences within international networks.

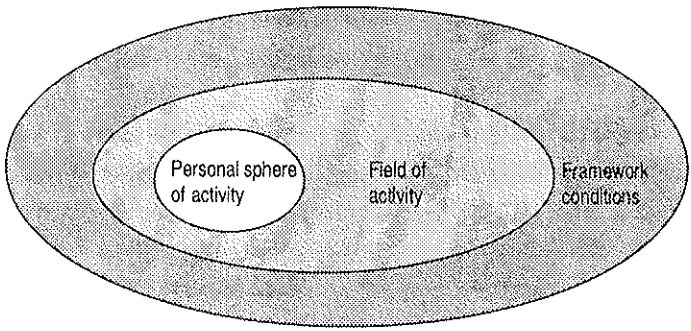
W+S systems modify the natural water cycle. The resulting secondary effects may hinder other uses of water which are sometimes far away from the water and sanitation system in question. So, ecological aspects of W&S systems are considered transsectorial.

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:



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

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 & Docmentation 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

The positions of interest, the roles, expectations, and focal points can be arranged quite differently by representatives on the same organizational level, as well as by representatives on the three different levels. In the end, it concerns the provision of a basic need for the beneficiaries, but it can mean for national politicians a question of political prestige or have an effect on a coming election, for the international aid organization it can signify the attempt to prevent an emigration from rural areas to the cities. The different perspectives can be fruitful so long as all

the parties work in the same direction, and contribute to form the widest possible support for the actual W&S installation. The prerequisites for a successful project/programme in the Water and Sanitation area are the representation of the interests of the local population, and the successful communication inside one specific level and between different levels through the definition of common goals and a common language.

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).

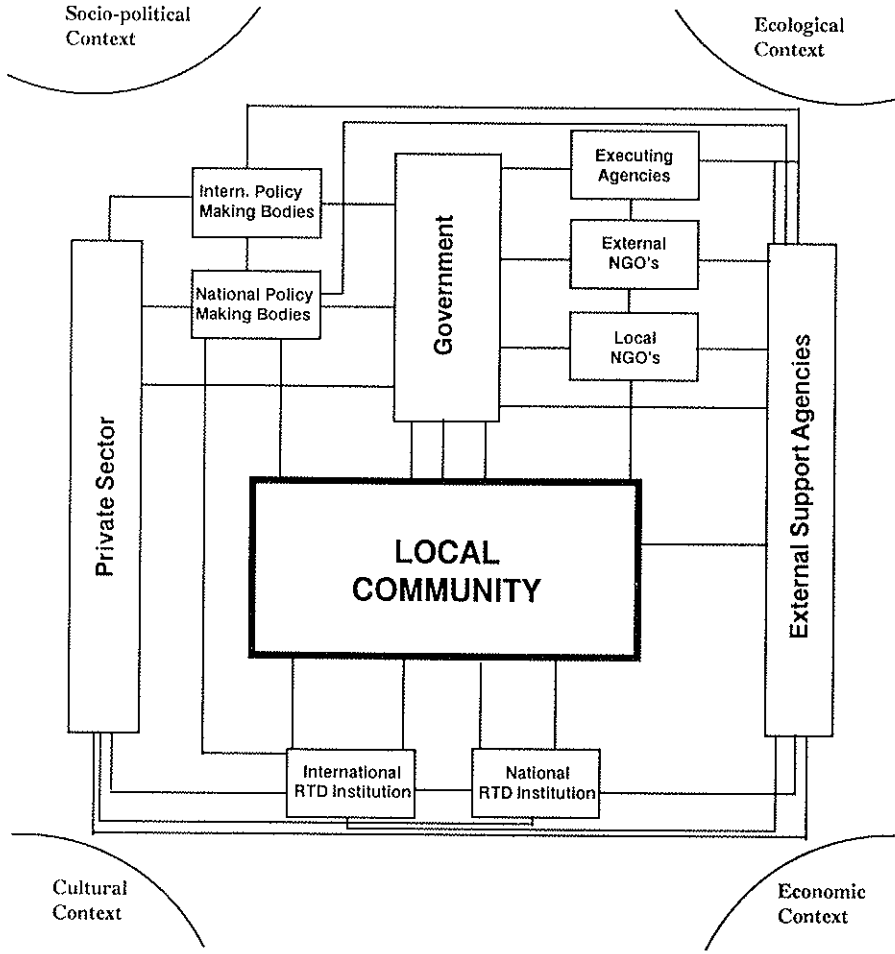
4. The Water and Sanitation Knowledge System (WSKS)

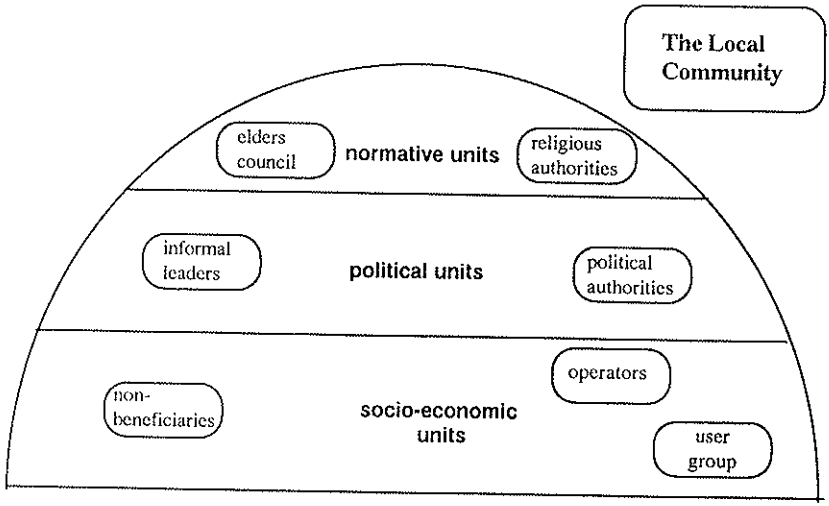
Making relationships transparent

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.


Socio-political Context
Ecological Context
Intern. Policy Making Bodies
National Policy Making Bodies
Government
Executing Agencies
External NGO's
Local NGO's
Private Sector
External Support Agencies
LOCAL COMMUNITY
International RTD Institution
National RTD Institution
Cultural Context
Economic Context


The Local Community
elders council
normative units
religious authorities
informal leaders
political units
political authorities
operators
non-beneficiaries
socio-economic units
user group

4.1 Structure of the model

Local community

Projects of water supply and village hygiene should be anchored in and realized on the lowest possible institutional level. In the approach of the WSKS the term "local community" is used to represent the group directly affected by the project and the group which actually realizes the project (for example village/city/district). How long the project will survive depends mainly on how far the local community is able to integrate the W&S installation into their everyday life and culture.

At first the "local community" can be regarded as a whole in its relations to other actors in the project/programme. If necessary, it can be further subdivided. The breaking down into normative level, political level and socioeconomic level mirrors the hierarchical relationships in the community (as shown in figure 2).

Government

W&S projects/programmes satisfy a basic need of the population and are therefore of great political importance for the government. The transfer of local programmes to regional and national levels is only possible if government representatives are incorpo-

rated from the beginning into the programmes on the national, regional, and local level.

Policy making bodies

By policy making bodies we understand temporary organizations and bodies on international and national levels with specific programme goals and international/national influence. Examples would be the 'Agenda 21', the 'Water Decade of the UNO', a national water supply programme, or a regional development programme, that promote or influence specific programme goals, set standards, and are able to make aware and mobilize a wide public.

External Support Agencies/Executing Agencies (ESAs)/NGOs external or local

The right side of the model shows the different actors in the area of international and national cooperation.

By External Support Agencies (ESA) we understand all donors who contribute means bilaterally or multilaterally for the realization of projects/programmes.

Organizations of the External Support Agencies that direct or realize projects are identified as "Executing Agencies" (for example Helvetas as agency of the SDC; GTZ as agency of the BMZ).

External NGOs are organizations not connected to the government that carry out their own projects.

Local NGOs are local groups that collaborate for the realization of a project goal. Parties, pressure groups, groups of interest are also included here.

Private Sector

The private sector includes actors in the economic circuit who are relevant for the project: technology providers, input providers and service sectors on international, national and local levels.

Research, Training and Documentation Institutions

The RTD institutions include universities, documentation centres, training institutions, but also the mass media and other information services.

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, eco-

nomical and ecological context. It is noteworthy that the contextual conditions can have quite different effects on the various project partners.

4.2 The WSKS initiates a thinking process

The WSKS serves as a thought pattern and makes possible a systematic ordering of the different interests and actors in a W&S project/programme, starting with a geographical separation of the actors. The WSKS is a model. In practice it will have to be filled in with specific terms and names. Adjustments according to the conditions of the specific project situation and other subdivisions are necessary and possible. The use of the WSKS follows a systematic procedure and calls for a clear classification of the actors. It allows to consider the project/programme as a whole and in its context, as well as to arrange specific subdivisions for special consideration.

The WSKS delivers a snapshot of a project situation from a mainly structural point of view. This simplicity and clarity in the observation criteria is one of the strengths of the model. It should never form the only basis of an important project decision or be misused to attach permanently certain actors in their present roles, or be viewed as forever unchangeable. Other points of view should be included in the search of solutions: the dynamic development perspectives, and the concrete distribution of assignments. The

descriptive analysis of the project structure in a participatory process which is made possible through the use of the WSKS represents a basis for trust and exchange between the project partners. It stimulates further discussion about the development of the project and the key-roles and bottlenecks identified by different actors.

If the different project partners employ the model in their specific project/programme situation, they may get completely different perceptions due to their different points of view. The establishing of a WSKS represents in this case a "common language" and allows to recognize the different perceptions, and to agree on common plans of action.

5. Using the WSKS

5.1 Possibilities to employ the WSKS

The WSKS can help a single responsible person of a project to understand quickly the project structure. In the ideal situation however, a participative process should be applied. The strength and advantage of the WSKS lies in the creation of a "thought pattern" and the establishing of a common language for all participants.

a) The quick survey

The WSKS serves to obtain a quick and comparable survey about a specific project/programme, or about one specific aspect. The roles of the main actors can be identified and weak points and bottlenecks can often be recognized in the planning phase.

b) The systematic analysis

The WSKS serves as a tool for a systematic analysis and reflection of a project/programme. It starts out from the basic structure of a project design. If necessary, it can be refined or worked out more in detail. Individual aspects like the flow of means, hierarchical relationships, or knowledge transfer can be observed.

c) A common basis of understanding in conflicting situations

The WSKS forms a common language for individual parties with different positions. The varying viewpoints become evident, which is a prerequisite to reach an agreement.

The WSKS is also a useful tool to put different partners in dialogue (for example in a ZOPP process). The different viewpoints become clear, and the pattern serves as a focal point for successful discussions.

5.2 Practical guidelines for the WSKS

The application of the Water and Sanitation Knowledge System in a specific project/programme situation takes two steps:

- Definition of the actors involved
- Analysis of the interactive processes

5.2.1 The first step: Naming the actors in the WSKS

The first step in the application of the WSKS consists in filling in the different positions in the WSKS with the respective actors. At this stage certain persons/ institutions can hold different roles. If no actor is

or planned for a certain position, it must be made clear if a person/actor is missing and must be defined or if the position is irrelevant for the present project/programme.

Practical questions:

- What contextual conditions is the project/programme subject to?
- Who is/are the External Support Agency (-ies)?
- Who is the Executing Agency?
- Which government offices are related to the project?
- etc. etc.

Practical procedure:

The outline of the WSKS forms a basis for the discussion of the different actors. The procedure has to be the one most adapted to the situation and the participants, and also most conducive to the level of participatory processes desired.

Examples:

a) The outline of the WSKS is copied onto a poster. All the participants together, or divided in smaller groups fill in the different positions and describe the specific role/roles. A moderator or the participants write cards and fill the outline on the poster little by little with the actual names of actors and discuss the different arrangements.

b) The participants list (alone or in small groups) the names of the actors in the project/programme on cards and arrange them onto an empty poster. The result is then compared to the outline of the WSKS, and offers the basis for intensive discussion about clear, unclear, and missing positions.

For demonstration of a practical application of step1 see the examples 1 and 2.

5.2.2 The second step: Which relationships are important for the actual project?

When the different positions and actors are named, the attention is turned to the relationships between the various actors/roles. An arrow or 'channel', indicating the form and/or the direction of the relationship can be marked on the scheme. The WSKS allows the representation of a variety of complex relationships and feedback. Useful aspects in W&S project/programmes are:

- flow of information (Knowledge System)
- flow of money/material
- training
- hierarchical levels, relations of power
- decision making
- relationships from the view of a specific actor

Only one point of view should be considered at a time.

Example 3 shows the result of such an intensive process in the definition of the various relationships of one specific actor with other institutions and persons involved in the project development.

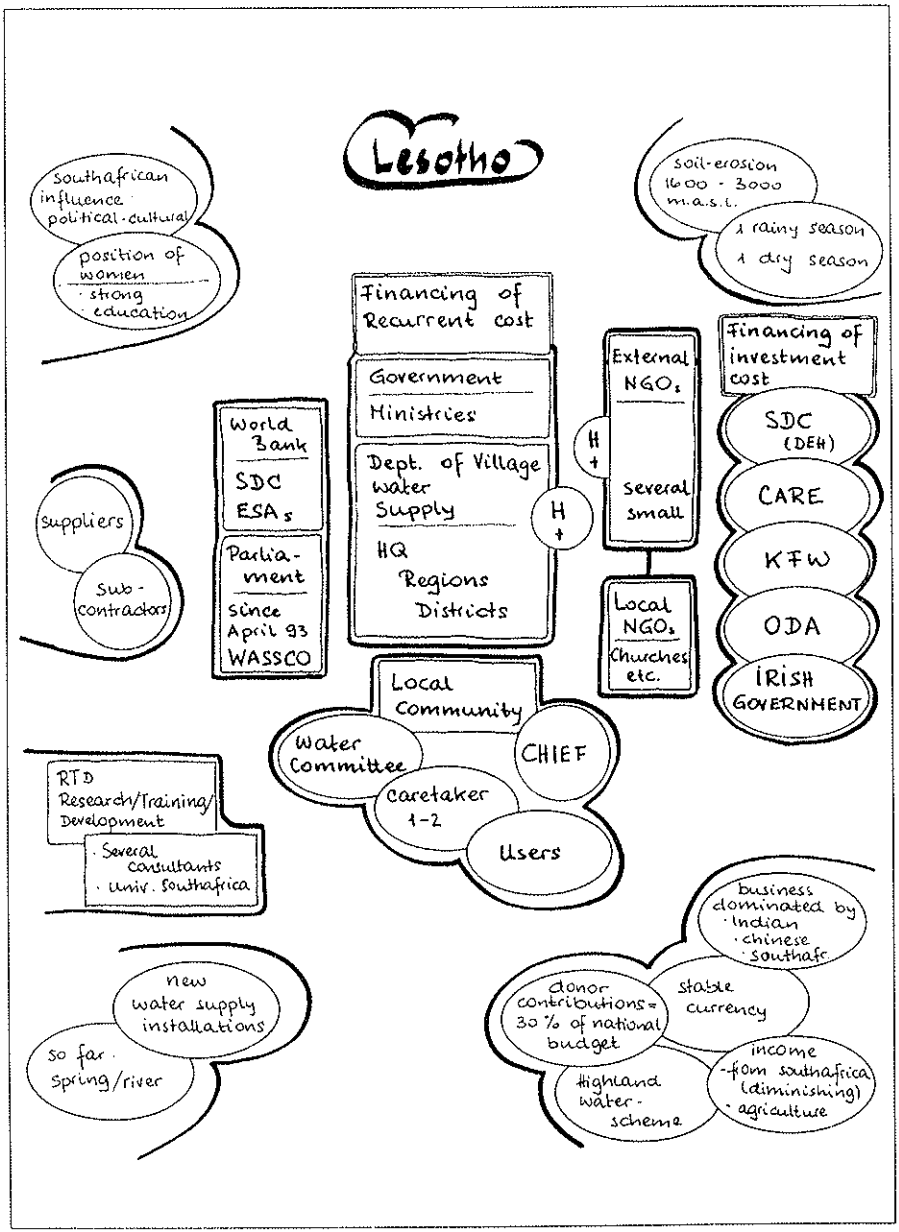
5.3 Practical Examples

The following three examples show practical applications of the WSKS in the analysis of specific project situations. The first and the second example represent Step 1 by naming the actors of the project. The third example represents Step 2 by showing a complexe network of relationships of one specific actor to the other institutions and persons involved in the project.

Example 1:
Rural Water Supply in Lesotho

The project started in 1978. Its goal is the water supply for all villages of Lesotho. The project is carried out through the Village Water Supply Section (VWSS) of the Government of Lesotho. Different international donors support the government in this plan with financial help and technical support. One of the donors is SDC who finances a mission of Helvetas.

The Lesotho VWSS system serves up to 2000 villages whereas approx. 60% of the rural population is included.

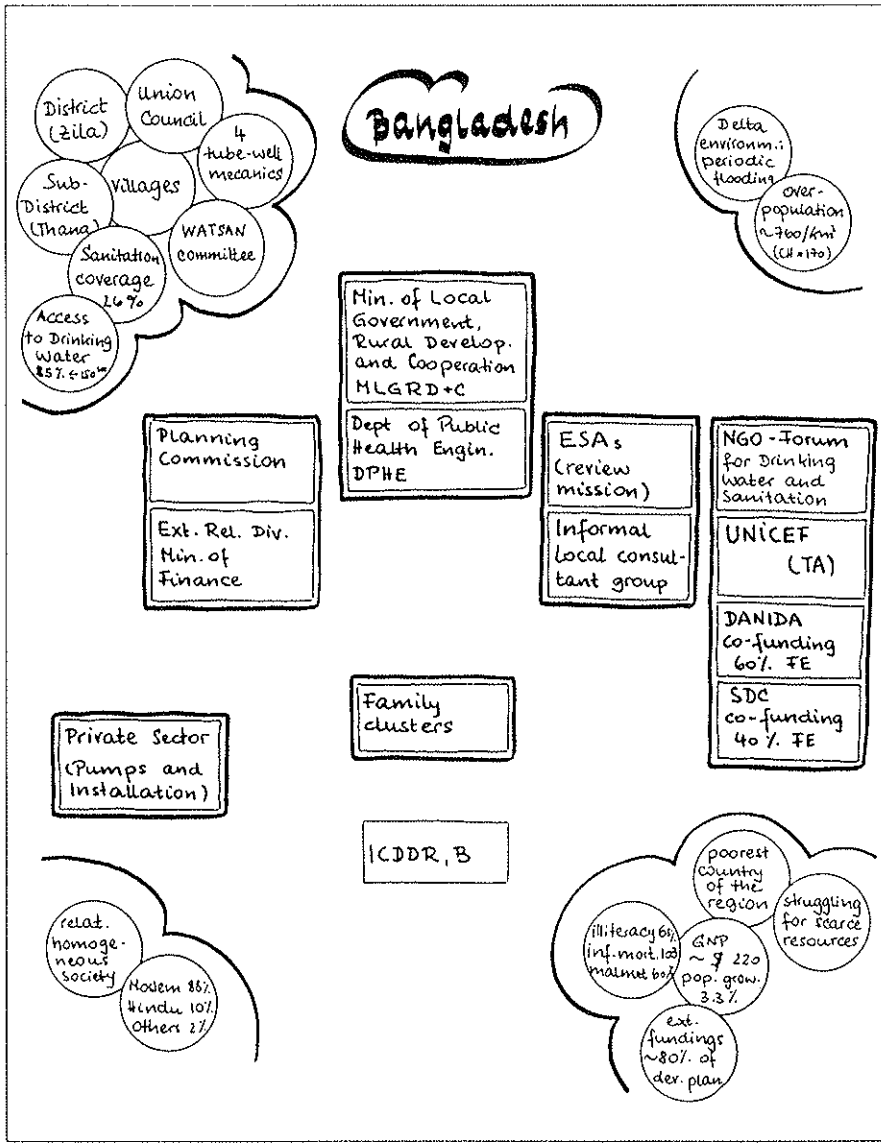

Lesotho
Southafrican influence
· political · cultural
position of women
· strong
· education
soil-erosion
1600 - 3000 m.a.s.l.
1 rainy season
1 dry season
Financing of Recurrent cost
Government
Ministries
Dept. of Village Water Supply
HQ
Regions
Districts
H +
External NGOs
Several small
Local NGOs
Churches etc.
Financing of investment cost
SDC (DEH)
CARE
KFW
ODA
IRISH GOVERNMENT
World Bank
SDC
ESAs
Parliament
since April 93
WASSCO
Suppliers
Sub-contractors
Local Community
Water Committee
CHIEF
Caretaker 1-2
Users
RTD
Research/Training/Development
· Several consultants
· Univ. Southafrica
business dominated by
· Indian
· chinese
· Southafr.
donor contributions = 30 % of national budget
stable currency
income
-from southafrica (diminishing)
· agriculture
highland water-scheme
new water supply installations
so far
spring/river

Example 2:
Rural Water Supply and Sanitation Programme in Bangladesh

A rural water supply and sanitation programme in Bangladesh has been carried out since 1975 with the goal to reduce diarrhoea and parasitic diseases through the supply of clean drinking water and improved village hygiene. The national competence in this area should be strengthened. The project is financed through SDC and DANIDA. The responsible institutions are UNICEF and the National Department of Public Health Engineering in the Ministry for Local Government, Rural Development and Cooperation.

It is expected that the project will provide 9 million people with clean water, and that 3.3 million families will be equipped with better latrines. The social mobilization for village hygiene should be strengthened.

The present WSKS of this project shows an example for analysis where special emphasis is attached to the contextual conditions.


Bangladesh
District (Zila)
Union Council
4 tube-well mecanics
Villages
Sub-District (Thana)
WATSAN committee
Sanitation coverage 26%
Access to Drinking Water 85% ← 50%
Delta environm.: periodic flooding
over-population ~760/km² (CH ≈ 170)
Min. of Local Government, Rural Develop. and Cooperation MLGRD+C
Dept of Public Health Engin. DPHE
Planning Commission
Ext. Rel. Div. Min. of Finance
ESAs (review mission)
Informal local consultant group
NGO-Forum for Drinking Water and Sanitation
UNICEF (TA)
DANIDA co-funding 60% FE
SDC co-funding 40% FE
Family clusters
Private Sector (Pumps and Installation)
ICDDR,B
relat. homogeneous society
Moslem 86%
Hindu 10%
Others 2%
poorest country of the region
struggling for scarce resources
illiteracy 64%
inf.-mort. 108
malnut 60%
GNP ~ $ 220
pop. grow. 3.3%
ext. fundings ~80% of dev. plan

Example 3:
Definition of roles in the NETWAS network

The International Training Network for Water and Waste Management (ITN) is a UNDP/WB Programme that was set up as part of the global support to the International Drinking Water Supply and Sanitation decade. Its main objective is the promotion of Community Based Water Supply and Sanitation through training and information support services. The network for Water and Sanitation (NETWAS), established in Nairobi in 1986, was the first of the four ITN centres in Africa.

NETWAS operates in Kenya, Uganda, Tanzania, Ethiopia, Sudan and Eritrea. Its main activities are Documentation, Human Resource Development and Advisory Services.

In an evaluation of the first years of activities of NETWAS, made in 1994, the Water and Sanitation Knowledge System has been used as a tool to describe the relationships of the institution with other institutions, to define bottlenecks in the flow of information and to clarify the roles of the actors involved.

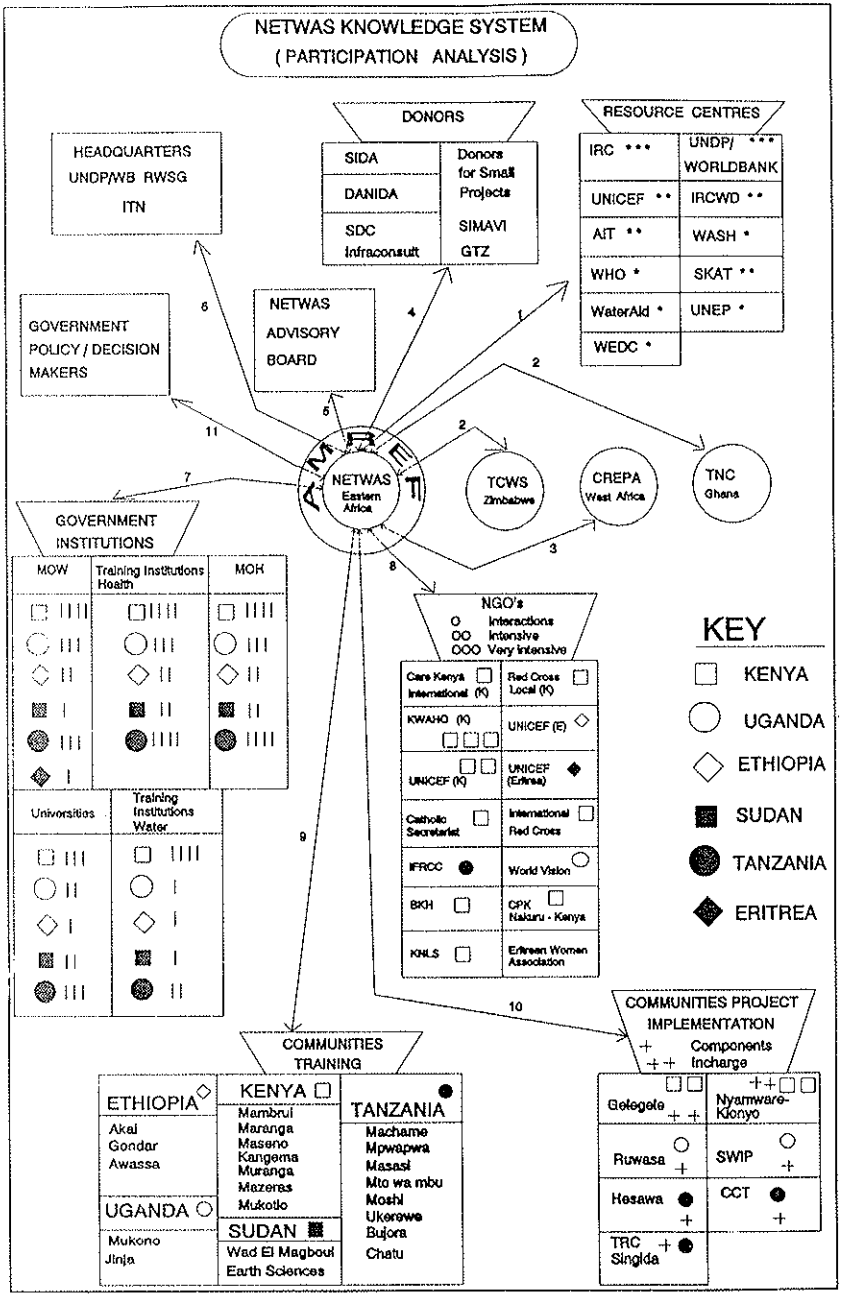
The elaboration of the represented 'project map' is the result of the following steps:

a) The naming of the actors in the project in small groups with the help of the WSKS.

b) The definition of the main relationships between the different actors.

c) The identification and discussion of bottlenecks.

d) The analysis of the relationships of one main actor to all the others involved in the project.


NETWAS KNOWLEDGE SYSTEM
(PARTICIPATION ANALYSIS)
HEADQUARTERS
UNDP/WB RWSG
ITN
DONORS
SIDA
DANIDA
SDC
Infraconsult
Donors for Small Projects
SIMAVI
GTZ
RESOURCE CENTRES
IRC ***
UNDP/ WORLDBANK ***
UNICEF **
IRCWD **
AIT **
WASH *
WHO *
SKAT **
WaterAid *
UNEP *
WEDC *
GOVERNMENT POLICY / DECISION MAKERS
NETWAS ADVISORY BOARD
NETWAS
Eastern Africa
TCWS
Zimbabwe
CREPA
West Africa
TNC
Ghana
GOVERNMENT INSTITUTIONS
MOW
Training Institutions Health
MOH
Universities
Training Institutions Water
NGO's
O Interactions
OO Intensive
OOO Very intensive
Care Kenya International (K)
Red Cross Local (K)
KWAHO (K)
UNICEF (E)
UNICEF (K)
UNICEF (Eritrea)
Catholic Secretariat
International Red Cross
IFRCC
World Vision
BKH
CPK Nakuru - Kenya
KHLS
Eritrean Women Association
KEY
KENYA
UGANDA
ETHIOPIA
SUDAN
TANZANIA
ERITREA
COMMUNITIES TRAINING
ETHIOPIA
Akal
Gondar
Awassa
UGANDA
Mukono
Jinja
KENYA
Mambrui
Maranga
Maseno
Kangema
Muranga
Mazeras
Mukotio
SUDAN
Wad El Magboul
Earth Sciences
TANZANIA
Machame
Mpwapwa
Masasi
Mto wa mbu
Moshi
Ukerewe
Bujora
Chatu
COMMUNITIES PROJECT IMPLEMENTATION
+ Components Incharge
Gelegele
Nyamware-Kionyo
Ruwasa
SWIP
Hesawa
CCT
TRC Singida
1
2
3
4
5
6
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8
9
10
11

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