



---

## **From Sector Reform to Sector Revolution**

---

A new (and revolutionary) approach is needed in order to ensure sustainable operation and maintenance of installed systems.

**Report on the 17<sup>th</sup> AGUASAN Workshop  
Gersau, Switzerland,  
June 25 to 29, 2001**



**compiled by Adrian Coad, SKAT**

# **Swiss Centre for Development Cooperation in Technology and Management**

---

## **From Sector Reform to Sector Revolution**

---

A new (and revolutionary) approach is needed  
in order to ensure sustainable operation and maintenance  
of installed systems

**Report on the 17<sup>th</sup> AGUASAN Workshop  
Gersau, Switzerland,  
June 25 to 29, 2001**

**compiled by Adrian Coad, SKAT**

## Table of contents

Chapter 1	Summary.....	1
Chapter 2	An overview of the Workshop programme .....	3
2.1	Introduction .....	3
2.2	Introduction by the lake .....	4
2.3	Presentation on Paradigm Shift .....	4
2.4	Personal introductions .....	4
2.5	Deepening our understanding .....	5
2.6	Discussions in cultural groups .....	5
2.7	Field visit to Geuensee .....	5
2.8	Examples, puzzles, tools and exercises .....	5
2.9	Introductions to the case studies.....	6
2.10	Informal evening sessions .....	6
2.11	Assignments in case study groups.....	6
2.12	Harvesting .....	7
2.13	Concluding session .....	7
Chapter 3	Towards a new way of thinking .....	9
3.1	The influence of paradigms.....	9
3.2	Struggling free of unnecessary assumptions .....	10
3.3	What is a paradigm? .....	11
3.4	Roles of paradigms .....	11
3.5	Changing a paradigm .....	12
3.6	Examples of paradigm shifts .....	13
3.7	Tools for modifying mindsets .....	14
3.8	Applications in the rest of the workshop.....	20
Chapter 4	Outputs of cultural working groups .....	21
4.1	Introduction .....	21
4.2	African group .....	21
4.3	Asian group.....	21
4.4	European group 1 .....	22
4.5	European group 2 .....	22
4.6	European group 3 .....	23
Chapter 5 - Practical applications – the case studies.....		25
5.1	Review of the general process of the group work.....	25
5.2	Water supply after more than twenty-five years – a case study from Cameroon .....	26
5.3	Operation, Maintenance and Sustainability of Urban Services in Faisalabad, Pakistan .....	33
5.4	Franchise Management of Solid Waste Services in Ghana .....	38
5.5	Maintaining rural water supplies in Lesotho .....	42
5.6	Postscript .....	46
Chapter 6	Conclusions and reflections .....	47
6.1	Concluding comments from Elisabeth Stern, the Resource Person .....	47
6.2	Conclusions of the editor .....	47

Annexes

## Chapter 1      Summary

If reform does not bring the needed results we may need a revolution. Not a political revolution, but a revolution in the way we seek to solve problems, a sweeping away of restrictions that have limited the scope of our considerations, perhaps even a turning upside-down of the way we approach challenges. A revolution in thinking.

In spite of the dedication and efforts of professionals in the water supply and sanitation sector, it is estimated that, worldwide, 1.1 billion people do not have access to a safe and convenient water supply, and 2.4 billion lack suitable sanitation<sup>1</sup>. Millions suffer from inadequate drainage. Many facilities are not properly maintained and so cease to function adequately. As we look back we can see how changes in thinking have resulted in improved services. Technology has become more people-centred, affordable and easier to maintain. Resources have been devoted to demand creation and hygiene training. New mechanisms of financing have increased the sense of ownership and permitted wider coverage. But the goal of universal coverage still eludes us. New ideas are still needed, and perhaps we need to think in terms of revolutionary new ideas rather than minor reforms or adjustments to present practice and current thinking.

The objective of the 17<sup>th</sup> Aguasan Workshop was to release participants from old constraints and preconceptions so that we could see familiar problems in a new light and from a different perspective. By being encouraged to reflect on the way we think – our paradigms – we were helped to set ourselves free from hindering restrictions.

The Workshop was divided into two parts. The first was devoted to creating an awareness of our thinking processes and also to exercises that would help us to think new thoughts. This part was not restricted to the professional aspects of water supply and sanitation, but was wide-ranging, touching upon very personal issues. In the second part, four case studies were considered, and the tools and exercises that had been introduced in the first part were applied to these practical situations.

There is no doubt that the participants found the Workshop to be thought-provoking, useful and enjoyable. The programme included a stimulating mix of presentation, exercises and discussion. The success of the workshop was due to the skill, knowledge, experience and consideration of the Resource Person, Elisabeth Stern, who opened up the topic in the first part, and of the Moderator, Tonino Zellweger, whose skilful guidance and oversight moulded the programme. The planning group of Armon Hartmann, Karl Wehrle, Franz Gähwiler and Martin Wegelin are also to be commended for their perception and boldness in choosing such an unconventional topic and turning the idea into the event. The financial support of SDC is gratefully acknowledged, as are the contributions of the case study presenters. The hospitality, facilities and high standards of the Paradigmhotel, Rotschuo were also much appreciated.

This report is not just a souvenir and reminder for the Workshop participants. It also aims to communicate to a wider readership the essential ideas and tools that were presented and applied during the workshop, and to illustrate the results and benefits that can be expected when we try to improve and release our thinking processes. For this reason, information that is mainly of interest to those who participated in the Workshop is presented in the Annexes, and the main body of the

---

<sup>1</sup> Figures for the year 2000 in *Global Water Supply and Sanitation Assessment; 2000 Report*, World Health Organisation, UNICEF and the Water Supply and Sanitation Collaborative Council

report is targeted more generally. Chapter 2 reviews the elements of the workshop programme. Chapter 3 explains the ideas about our thinking that were presented and explored in the first part of the Workshop. Chapter 4 summarises the discussions of some working groups. Chapter 5 introduces the case studies and, for each one, describes how the exercises and approaches that had been introduced earlier were applied to different problems and situations. The last chapter provides a summary and conclusions.

Annex 1 reproduces the introductory paper that was circulated to participants before the Workshop. Annex 2 suggests some further reading. The last annex provides a few definitions of terms and abbreviations that may be new to some readers; this list is on the last page so that it is easy to locate while reading elsewhere in the report. The other annexes include records of aspects of the workshop that are probably of particular interest to those who actually participated.

This report is a record of the ideas and reactions of the individuals that participated in the workshop. Some of the comments made in the groups that were studying the particular case studies may appear critical of the institutions that were connected to the particular situations that were discussed. Such critical comments may have been made by participants who have no direct connection with the cases that they were discussing, and may have been based on experience from a different situation. The inclusion of criticisms in this report does not mean that the case study presenter agreed with or supported them. Therefore, the case study presenters should not be held responsible for any critical comments made in the groups, since the presenters were not given the opportunity to edit or suppress the comments of others. On the other hand, comments made by outsiders, whether critical or not, can be the keys to new understandings, and so should be valued and considered. As this report will show, an unconventional and unexpected observation, or the discarding of an assumption, might be just what is needed to lead to the needed change or the desired solution.



Group photo, taken at Geuensee (See Annex 4)

## Chapter 2 An overview of the Workshop programme

### 2.1 Introduction

This chapter describes briefly the main events of the Workshop. The thematic input and the deliberations concerning case studies can be found in chapters 3 and 5 respectively. The outline schedule below shows the main components of the programme, and the sections of this report where each particular component is discussed.

From Tuesday onwards, each morning began with a humorous review of the previous day's sessions. This not only helped to get us ready in time, and provided many laughs, but also reminded us in a useful way of what we had done the day before.

Day	Component	Section
Monday	11.00 a.m. Introductions by Karl Wehrle and Elisabeth Stern Outdoor exercises with Eurotrek Presentation – Introduction to Paradigm shift by Elisabeth Stern Introductions of participants Continuation of presentation by Elisabeth Stern Information about the workshop by Karl Wehrle and Tonino Zellweger	A3 3 A9 3
Tuesday	Presentation and discussion led by Elisabeth Stern Discussions in cultural groups Field visit to Geuensee	3 4 A4
Wednesday	Comments on field visit and presentation of paradigms in various disciplines by Elisabeth Stern Continued presentations by cultural groups Brain jogging tools – presentation by Elisabeth Stern Exercises outside – observing, feeling and describing, led by Elisabeth Stern Brief presentations of case studies – Tonino Zellweger and case study presenters Case study groups – detailed presentations and exercises Informal evening presentations	3 4 3 3.7.7 5 5 A8
Thursday	Presentation of figure/ground reversal by Elisabeth Stern Case study groups – application of figure/ground reversal Case study groups – looking at another case, then working on selected paradigms Informal evening presentations	3 5 5 A8
Friday	Sharing of results from case study groups in two "markets" Harvesting - review of workshop, lessons learned, The current water and sanitation context by Armon Hartmann Comments by Elisabeth Stern Suggestions for the next workshop and final comments Presentation of certificates and conclusion of Workshop	2.10 A6 A7 6.2 A13

## 2.2 Introduction by the lake

Karl Wehrle set the scene by emphasising that the measures that had been used to provide water and sanitation have not been sufficient and that new approaches and ways of thinking were required. Therefore, the Aguasan organisers had requested Elisabeth Stern, who had conducted many seminars for industry with the aim of encouraging and promoting new ways of thinking, to lead the Workshop.

Elisabeth Stern, the Resource Person, explained that she was concerned to help us develop a new mindset, by starting a process that would lead to a new way of looking at the problems that face us. She would encourage us to step away from our normal ways of looking at problems into something completely different, learning from other disciplines. Standing by the lake, she said that we might be like fish, who are only aware of the world that exists below the surface of the lake, and that her concern was to help people in that situation to be more aware of the bigger picture, and alternative ways of seeing the world.

Then participants were divided into three groups, according to birthdays, and three experts from an outdoor training organisation called Eurotrek led us in five exercises: - *Explaining shapes*, *The spider's web*, *The route through the squares*, *The bell tower*, and *Crossing the islands*. These exercises are explained and illustrated in Annex 3. Not only did these exercises provide an excellent way of starting the Workshop, but they also taught valuable lessons such as

- ◆ How some tasks can seem so difficult or require so much work before we achieve success, and then appear so easy or obvious in hindsight, when we know how they can be accomplished;
- ◆ The importance of listening to and considering *all* suggestions instead of immediately operating in the conventional way;
- ◆ The importance of seeing the problem from the point of view of the other side or the other person, of putting ourselves in the shoes of the other and asking ourselves "Why does he think in the way that he does?";
- ◆ The importance of identifying the particular strengths or roles of each component, and designing the solution in accordance with these strengths, and
- ◆ It is often important to decide on a strategy only after we have considered the whole problem, (rather than considering only the first step at the beginning, and not thinking about later steps until the first has been accomplished).

## 2.3 Presentation on Paradigm Shift

The Resource Person, Elisabeth Stern, provided an introduction to the basic message of the Workshop – the need for a paradigm shift, so that we are able to approach familiar problems in new ways, thereby finding new solutions. The content of this and other presentations is written in Chapter 3. The points were illustrated using anecdotes and examples that showed the importance of mindset and understandings, and participants were encouraged to participate by solving problems and considering our own views.

Participants were asked to do some homework in the evening – to look at a paradigm by which we order our relationships, whether in the family, at work or in general.

## 2.4 Personal introductions

Each participant was asked to introduce herself/himself, according to a form which had been circulated. The form asked participants to state our life mottoes and to say which career we would have liked to follow if we had not chosen what we are doing at present. It was surprising how many

of us nearly became farmers. (We soon discovered that the question about second choice of career had a serious purpose to it.)

## **2.5 Deepening our understanding**

The morning of the second day included several components to help us get a better grasp of the material that had been presented. This included discussion based on the paper that had been circulated beforehand (see Annex 1), the homework on relationships, reactions to what had been presented, and further explanations from Elisabeth Stern.

## **2.6 Discussions in cultural groups**

Considerations of paradigms are closely related to culture. All or most of the research and thinking in this field has been done against a background of European and North American cultures. The Workshop provided an excellent opportunity of sounding out the opinions of participants from a range of cultures, to see whether the ideas that were being presented were relevant to cultures and countries where little work on paradigms had been done. So a group was formed from participants from Africa, and another with participants from Asia, with the objective of investigating new cultural angles to the material that had been presented so far. One French-speaking group and two German-speaking groups were formed from the European participants. The African and Asian groups were asked to discuss a non-technical area in which there had been a significant shift of paradigms in recent years. The European groups were asked to examine past and current paradigms in development aid.

The reports of these groups are summarised in chapter 4.

## **2.7 Field visit to Geuensee**

Field visits can serve many purposes. They give participants a chance to meet and talk in informal settings. They give overseas participants a chance to see some of the surrounding countryside. They add variety to the programme. They give opportunities to observe other technologies. The field visit of this Workshop achieved all these objectives, but much more, in that we were able to meet a community leader who had moved away from the conventional approach to a water supply and sanitation problem, to see what he had achieved and to learn from him how he had implemented his new ideas. It was a concrete expression of a paradigm shift. The visit is described, and the discussion is summarised, in Annex 4.

## **2.8 Examples, puzzles, tools and exercises**

It is not a simple thing to change a way of thinking or the process by which we approach problems. It is not enough to learn a new vocabulary and to practise pronouncing the word "paradigm" in the correct way. To help us grasp the message of the workshop, many methods and examples were used. Elisabeth Stern cited examples from many different disciplines, showing what changes in paradigms had taken place, and what effects these changes had caused. The working groups then brought examples in connection with development aid, listing the many changes in approach that had guided planning in this field during half a century. We were then challenged by some puzzles and questions of various kinds, classed generally as brain jogging. (The term may be linked to the concept of steady running to improve fitness and strength, or to the shaking of brain cells that (hopefully) leads to new ideas and capacities.) Some challenged us to move outside the boundaries that normally define our thinking. Others made us consider common items in a new way. Tools

were presented that could help us to develop new approaches to old problems. This part of the programme concluded with some exercises in the garden by the lake. These are all discussed in more detail in Section 3.7.

## 2.9 Introductions to the case studies

The second part of the Workshop was led by the Moderator, Tonino Zellweger. He explained that the case studies were to provide material for exercises, and that we should not expect to solve the problems posed by the cases, because in the time available it would not be possible to present all the information that would be needed to find effective solutions. It could happen that the presenter of each case is too close to the situation to see more than one solution, and it was hoped that the discussion and the exercises would help them to identify alternative possibilities for consideration.

First the cases were presented briefly to all participants so that each person could select the case study that they would like to discuss in more detail. The four case studies were:

1. Water supply after more than twenty-five years – a case study from Cameroon, by Numfor A. Esther;
2. Operation, Maintenance and Sustainability of Urban Services in Faisalabad, Pakistan, by Shahid Mahmood;
3. Franchise Management of Solid Waste Services in Ghana, by Lukman Salifu.
4. Maintaining rural water supplies in Lesotho, by Makhotso Lemphane

## 2.10 Informal evening sessions

On the Wednesday evening two videos were shown. The first was about solar disinfection at the household level and the second was an innovative video about a water supply project in the north of Mozambique. They are described briefly in Annex 8.

The following evening there were two further presentations. One was to introduce a new website developed in conjunction with WHO on the subject of the management of healthcare waste, and the other was a presentation on rainwater harvesting for water supplies. Again, more information can be found in Annex 8.

## 2.11 Assignments in case study groups

After the introductory presentations, the participants were divided, after some negotiation, into reasonably equal groups. The first objective for each group was to make the members familiar with the key points of the particular case study, so that they would be aware of the basic paradigms.

Tonino Zellweger then directed the groups to examine the cases using some of the tools and approaches that had been explained by Elisabeth Stern in the first part of the workshop. These tools are explained in the next Chapter (especially Section 3.7), and the way that they were applied to the case studies is described in Chapter 5.

The last main group exercise was done by sub-groups that were formed by dividing each case study group into three. As a result many ideas were generated. It would have taken too much time to share the output of each subgroup in a useful way in a normal plenary session, so the outputs of the sub-groups were shared in two markets, as described below:

*Each subgroup prepared two charts which could be displayed on pinboards. Each market involved two case study groups, and therefore six sub-groups. For thirty minutes a member of each subgroup was standing next to the charts to explain to any visitors the main points of the*

*subgroup's deliberations. In this way the members of other sub-groups could become acquainted with the work of the other participants and ask questions. After this half-hour period the other two groups set up their posters and explained them to the others as they milled around.*



The market in action

Photo: Urs Fröhlich

## 2.12 Harvesting

This session was devoted to collecting together the insights that had been gained during the workshop and the lessons that had been learned. Each participant was given a large sheet of paper and asked to write in large letters her/his name and

- ◆ two insights that they had picked up from the workshop,
- ◆ two lessons that they had learned, and
- ◆ the first thing that they would do when they returned to their place of work, and the time by which it could be accomplished.

When this had been done and the sheets of paper fixed to the walls, each person was given one adhesive circle and asked to place it on the insight or lesson learned that they regarded as the most important outcome of the workshop. The "winners" were:

It is more effective to be approximately right than perfect but stuck to an old paradigm  
(take some risk)

and

Don't be shy to explore crazy ideas

The other insights and lessons that were "harvested" are listed in Annex 6

## 2.13 Concluding session

Armon Hartmann of SDC spoke about the global partners in the water supply and sanitation sector. More details of this talk can be found in Annex 7.

Then Elisabeth Stern made some concluding comments, including her impressions about the achievements of the workshop (which are summarised in Chapter 6).

Next, participants were invited to propose themes for the next Aguasan workshop. Each table (with an average of five participants) was invited to suggest three topics. These are listed in Annex 13.

There was an opportunity for participants to make any further comments that were on their minds.

- ◆ The possible negative connotations of word *revolution* (used in the title of the workshop) were mentioned. The word can be understood in the political sense (making politicians anxious) and it can suggest the overthrow or sidelining of leaders of organisations and departments because of radical changes. Therefore it should be used with care.
- ◆ We were reminded that each of us is an ambassador on behalf of those suffering from inadequate water supply and sanitation, and because the task is so huge we must develop synergies and use them.
- ◆ The organisers were thanked for the good job they had done in running the workshop.

Water supply manuals and a list of 20 basic books were handed out, together with a photocopy of a newspaper article regarding the site visit to Geuensee (Annex 4). An attendance certificate and a group photo were presented to each participant.

Karl Wehrle concluded with a vote of thanks to the Resource Person, Elisabeth Stern, for sharing her experience with us in such a useful and informative way, and to the Moderator, Tonino Zellweger for his expert guidance during the week.



The Resource Person  
Elisabeth Stern



Armon Hartmann and Karl Wehrle

Photo: Urs Fröhlich

## Chapter 3     Towards a new way of thinking

This chapter aims to summarise the information and examples given in the presentations by Elisabeth Stern. Since the presentations were conducted in a lively, interactive way, some of this information was given in response to contributions from participants, and therefore not always within a planned structure. An attempt has been made to reorganise the material to some extent.

The following quotation from Marcel Proust was taken as the Workshop motto:

The real voyage of discovery consists not in seeking new landscapes but  
in having new eyes

The task before us is to learn to look at familiar problems with new eyes. We need to stretch our perceptions and imaginations to take a completely different viewpoint, to step outside our usual mindset. We can visualise this as putting on a hat that we never normally wear, such as that of a fire-fighter, and try to imagine how such a person would see the issue that we are grappling with.

### 3.1     The influence of paradigms

The importance of mindset, perception and understanding was illustrated by the following accounts from the period immediately following the second world war:

*Some men from New Guinea, after returning home from the war, having been away for more than a year, were very happy to find that their wives were pregnant. On the other hand, some men from Sicily in the same situation, when they came home to find their wives pregnant, were very angry, forced their wives to leave, and plotted murder.*

Participants suggested a number of reasons for this huge difference in reactions, gradually converging on the fact that the men in these two situations had very different understandings of how women become pregnant.

Participants were asked to suggest reasons for the difference in these reactions. Some of the comments that were made can be found in Annex 11.

We very rarely reflect on our mindset – our fundamental understandings and beliefs. We think that we are right, objective and rational, but need to become aware that other opinions and convictions can also be rational, but are different from ours because they are based on different fundamental beliefs. We need to be aware that the glasses we look through have coloured lenses.

The power of the mind was illustrated by two more stories

*About 12 years ago there had been a serious earthquake in Mexico City. One of the buildings that was destroyed was a hospital. Everyone who had been trapped in the hospital had died, except for 18 babies who were found alive after being trapped in the ruins for many days.*

*Elsewhere, at the same time, a man who was driving a large truck carrying frozen food was concerned that the refrigeration equipment was not working properly. So he went back to check it, and when he was inside the truck compartment that held the food, the door slammed shut, locking him in. He died, even though the refrigeration equipment was broken and the temperature inside the compartment was not dangerously low. The driver's heart had given up*

*because he was persuaded that he was in a fatal situation, and he expected to die. On the other hand, the 18 babies had no preconceptions about life and death, and carried on living.*

*A participant made the same point with a personal anecdote. In earlier years when he had no refrigerator, he would never eat food the day after it had been prepared, because, being kept at room temperature, the food would be spoiled and would make him ill. Now that he has a refrigerator, he finds that, even if the food is kept in the refrigerator, if he eats it the day after it has been prepared, he invariably becomes ill, and the reason for this appears to be his childhood experiences convincing him that the food cannot be good, and his body reacts in accordance with this childhood belief.*

*Aeronautical science has proved that a bumblebee should not fly because of its physical dimensions. However, since bumblebees do not know this, they fly!*

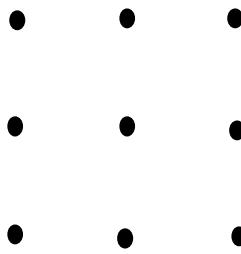
These experiences show the power of the mind, and the influence of our beliefs on the way we see and what we expect.

We need to ask ourselves why we are doing what we do in the way that we do it.

## 3.2 Struggling free of unnecessary assumptions

*Exercise: Join the dots Participants were asked to consider how four straight lines could be drawn so that they pass through all nine points in Figure 3.1 below. The lines must be drawn without retracing any line or lifting the pencil off the paper.*

**Figure 3.1**



The solution can only be achieved when an unnecessary assumption is abandoned. We usually assume that the lines must be confined within the square indicated by the dots; with this assumption the problem cannot be solved. When this assumption is discarded, and lines are drawn beyond the confines of this square, the problem can be solved. The solution can be found in Annex 11.

We need to look at the problem with new eyes. We need to ask ourselves what our assumptions are so that we can see which are necessary or valid, and thereby free ourselves to find solutions. When we are aware of our assumptions, we can deliberately step outside those that are invalid or no longer useful.

There are times when we need to cast aside old assumptions, ideas and approaches. For example, if some people in Switzerland wish to go to a particular building in Rome, the road map that guides them from Switzerland to Rome, though it has proven very reliable up to the outskirts of Rome, will not be adequate to show them how to find that building. They will need a street plan of Rome – the former “tool” is no longer adequate.

New challenges may require new tools. We must be ready to lay aside old assumptions and ideas.

Often, we are like a mouse always going down the same tunnel but never finding cheese. Maybe the mouse should try another tunnel.

### 3.3 What is a paradigm?

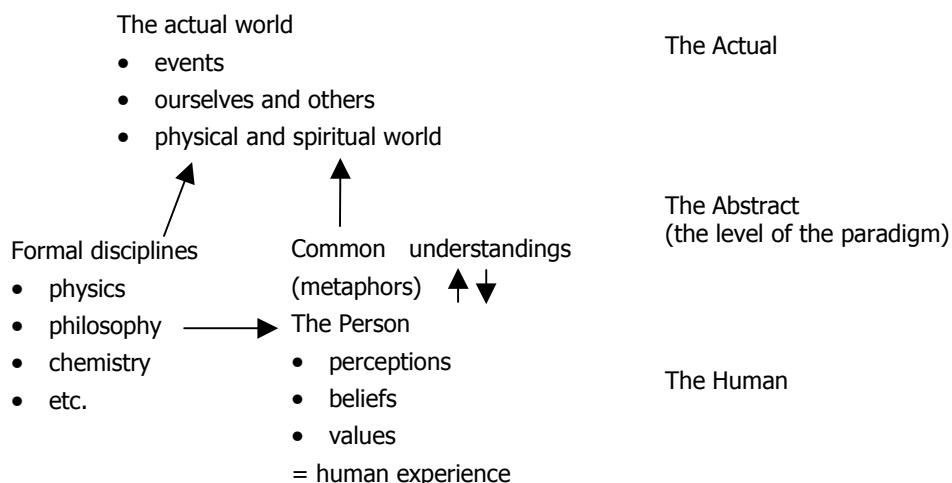
A paradigm is the lens through which I look at the world. I may think that others have coloured lenses, but that mine introduce no distortion. However it is important to realise that my lenses too have a particular colour, and that my view of the world is coloured by my beliefs and assumptions.

The beliefs we have influence our society, the way we are and the way we see ourselves. Values based on beliefs become very firm.

Paradigms have a range of levels of abstraction. For example, the expectation of starting each day with a shower exhibits a low level of abstraction, but the expectation that every life has a mission or purpose is a view of life that has a high level of abstraction and indicates a system of belief.

### 3.4 Roles of paradigms

#### The Role of Paradigms in Human Affairs (from Ogilvy)



Paradigms rise and fall. New information, new beliefs and other cultural influences may cause a new paradigm to gain acceptance. Often there is strong resistance to the change of a paradigm, as was the case when scientists argued against the European religious establishment concerning the earth being flat, and concerning the motion of the earth around the sun. However, it must be pointed out that the old way was not always worse, and the current view is not necessarily better. Right or wrong is not an issue here. (The current view should not be seen as the end point, the ultimate or perfection. Based on past experience we can expect that the most recent advances in thinking will later be superseded by new insights.) In general, when about 20% of the population accept a new view or paradigm, the paradigm is said to "flip", as the new one takes over. For example, when the proportion of the population opposed to slavery rose to 20%, the end of slavery was in sight.

The paper that was circulated before the workshop (in Annex 1) discussed some of the major paradigm shifts that have occurred in European history – for example the change from Aristotle's view of organic growth to the view that resulted from Newton's investigations – a mechanical world-view that led to machines and assembly lines and fragmentation of work – each worker repeating a simple function. A similar trend in education has resulted in a high degree of specialisation so that students are not encouraged to see the "broad picture".

Another example of a paradigm shift is provided by industrialisation. After the second world war, Swiss farmers started taking jobs in factories to supplement their farming incomes. When there was a special need on the farm, such as the birth of a calf, they would simply not go to their factory jobs, causing problems and conflicts. It was not until their paradigm of industrial employment changed that they became reliable workers.

The world has many different paradigms of a child's relationship to his/her parents. In the last hundred years in Europe we have seen a change from "Children should be seen but not heard" to a range of paradigms which include that teenage children should not listen any more to their parents. The justification for the latter paradigm is that the world the teenagers are growing up into is so different from the world that their parents know, that the advice of their parents will be of no use to them in the new world that awaits them.

### **3.5      Changing a paradigm**

When an existing paradigm is being challenged, the supporters of that paradigm may fear that they will lose everything – their power, their following, their beliefs – and this may lead them to oppose any change very vigorously. Challenging a paradigm that is related to a belief system (such as a religion), can have a profound effect, and so the challenging of such a paradigm may be avoided or cause feelings of guilt, because of the effect on others. We may want to release others from a paradigm which we feel is keeping them down (such as unequal treatment of women, or the caste system), but challenging such paradigms can unleash an avalanche. Agents of change must not be surprised by such repercussions.

It takes time for perceptions to change. In our projects we should not expect that implementing change is quick or easy. However, there are signs of acceleration, that now it takes less time for a paradigm to change than in the past.

The concern of this workshop is ourselves, not changing others. We need to look at our own paradigms, our own boundaries, and our own motives. We need to expand our own vision.

By discussing and interacting with others we may be helped to see our own paradigms and assumptions. In the same way, contact with other cultures can help us see the assumptions that are implicitly accepted in our own culture, and may give us opportunities of asking questions or making observations about the paradigms that are followed in the culture we are visiting. An example of this, again from Switzerland, is that mountain farmers find it very difficult to give directions to strangers, because they are unable to see the local terrain through the eyes of the visitors, but rather assume that the visitor can recognise the landmarks and features which are so well known to them.

Changes are certainly not always for the better. Some modern developments do not seem to have increased human happiness. The western preoccupation with individualism has some negative consequences. Many tourists from industrialised countries remark with surprise upon the happiness that they see in poor countries, because their materialistic paradigm leads them to believe that people with few possessions cannot be happy.

Absorbing paradigms from other cultures can lead to frustrations and conflict. For example, employees who go to study in another culture may find that the ideas and paradigms that they have seen and learned are not accepted in their organisation or in their culture when they return. This may be because the home organisation has the paradigm that junior staff are to be instructed, not to be listened to, and so they do not accept the opinions and suggestions of the returned student. It may be that the student has adopted new paradigms related to working practices or technical matters, but that the management of the home organisation is unwilling to accept these new ways.

Changes of paradigms take a long time. We often would like to speed up these processes, but we need to be patient.

### 3.6 Examples of paradigm shifts

<b>Major Paradigm Shifts</b>	<b>The Shift in Qualities</b>														
<ul style="list-style-type: none"> <li>• 10,000 y. ago: the agricultural revolution</li> <li>• 400 years ago: from the Ptolemaic to the Copernican System to the Enlightenment</li> <li>• from illiteracy to the making of books/scientific revolution</li> <li>• 300 years ago: from agriculture to the industrial revolution</li> <li>• at present: from industrial to post-industrial society</li> </ul>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Dominant Paradigm</td><td style="width: 50%;">Emergent Paradigm</td></tr> <tr> <td>• simple/probabilistic</td><td>• complex &amp; diverse</td></tr> <tr> <td>• Hierarchy</td><td>• Heterarchy</td></tr> <tr> <td>• mechanical</td><td>• holographic</td></tr> <tr> <td>• determinate</td><td>• indeterminate</td></tr> <tr> <td>• linearly causal</td><td>• mutually causal</td></tr> <tr> <td>• objective</td><td>• perspective<sup>2</sup></td></tr> </table>	Dominant Paradigm	Emergent Paradigm	• simple/probabilistic	• complex & diverse	• Hierarchy	• Heterarchy	• mechanical	• holographic	• determinate	• indeterminate	• linearly causal	• mutually causal	• objective	• perspective <sup>2</sup>
Dominant Paradigm	Emergent Paradigm														
• simple/probabilistic	• complex & diverse														
• Hierarchy	• Heterarchy														
• mechanical	• holographic														
• determinate	• indeterminate														
• linearly causal	• mutually causal														
• objective	• perspective <sup>2</sup>														

Elisabeth Stern quoted examples of paradigm shifts that have occurred in a range of disciplines, describing the earlier paradigm and the current paradigm in each case.

<b>Discipline</b>	<b>Previous paradigm</b>	<b>Current paradigm</b>
Medicine	from single cause of illness, treatable by a single <i>miracle</i> drug	toward multiplicity of causal factors
	from top down / doctor to patient / expert to object	toward active role for patient
Physics	from atomistic	toward quantum mechanics
	from mechanical	toward holographic <sup>3</sup>
	from absolute space and time	toward relativistic
	from universality	toward complementarity
	from objective	toward indeterminacy

<sup>2</sup> The objective paradigm assumes that the ideas and understanding of the observer have no impact on the observations, whereas the more modern understanding is that the observer's views and ideas influence the observations and outcomes.

<sup>3</sup> holographic – information is everywhere, if one part fails another part may take over.

(continuing...)

Discipline	Previous paradigm	Current paradigm
Chemistry	from equilibrium/static from entropy increasing	toward non-equilibrium/dynamic toward order increasing <sup>4</sup>
Brain theory	from localised “bits” of information	toward distributed “tuning” of system
Mathematics	from continuous functions (phenomena changing smoothly)	toward mapping discontinuities
Ecology	from stable ideal from closed systems	toward resilience and symbiotic relationships toward open systems <sup>5</sup>
Evolution	from “random” mutation from survival and conquest	toward diversity toward co-evolution and adaptability <sup>6</sup>
Philosophy <sup>7</sup>	from universal truth and eternal essence	toward relationships of resemblance and historical existence
Psychology	from conquest over the unconscious from individual from fixing deficits (looking back)	toward integration of the unconscious toward transactional toward fulfilling potential (looking forward)
Arts	from representational from stable, unchanging	toward abstract toward fluid, ever-changing

## 3.7 Tools for modifying mindsets

Einstein's dictum:

Problems cannot be solved within the same mindset that created them.

### 3.7.1 Lateral thinking



Lateral thinking is about moving sideways when working on a problem to try different perceptions, different concepts and different points of entry. The term covers a variety of methods including provocations to get us out of the usual line of thought. Lateral thinking involves putting things together which logically do not go together.

<sup>4</sup> Order increasing: The second law of thermodynamics says that entropy (disorder) increases, but there is now a theory that if things are allowed to go into chaos the result can be a higher level of order. Amsterdam used this theory to solve its traffic problems. (See Annex 2, reference by Prigogine)

<sup>5</sup> Previously anthropologists studied communities as closed , isolated systems, now it is understood that ecological and social systems survive better if they are permeable, open and diverse. Migration increases survival.

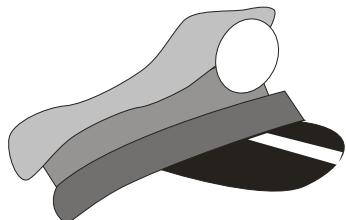
<sup>6</sup> Now evolution theory emphasises co-operation, not conquest. The effect of one organism on another is seen as important, and adapting to co-operate.

<sup>7</sup> Now philosophers are concerned with change – the meaning of existence and changing nature.

The enemy of lateral thinking is the habit of putting problems into categories and using only the tools or processes normally associated with the particular category to look for solutions.

*Puzzle: A man lives on the 12<sup>th</sup> floor. Every morning he takes the lift (elevator) directly to the lobby. In the evening, he returns, and takes the lift directly to his apartment if it is raining or if there is someone with him, but otherwise he takes the lift to the 10<sup>th</sup> floor and walks up the stairs to his apartment on the 12<sup>th</sup> floor. Why does he do this? (Suggestions and the answer can be found in Annex 11.)*

### 3.7.2 Put on another hat



This approach is to deliberately try to view the issue from the perspective of a person with a different background. For example, the problem could be viewed from the perspective of a policeman, so one should imagine putting on a policeman's hat.

Many different hats could be tried, such as a bishop's, or a pizza chef's, or the bride's mother's. This discipline helps us to consider the problem from the viewpoint of someone with other skills, and a different background, training, perspective and set of objectives. This can be much more difficult than it sounds and can require some imagination and effort to think in the way that someone else might think. However, there may be times when the effort of doing this leads to a breakthrough in solving a problem.

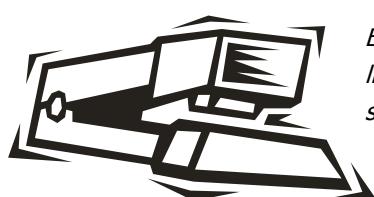
### 3.7.3 Mind games



*Example: The wolf, the goat and the cabbage. A man was taking these three items to the market to sell. On his way he was obliged to cross a river in a boat. He was able to take only one item at a time. He was concerned that the wolf would kill the goat and that the goat would eat the cabbage. How could he cross the river? (There were no trees or rocks on either side that would enable him to tie the animals so that they could be kept apart.)*

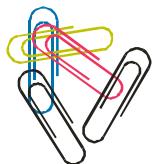
*(There are many variations of this problem, in terms of the conditions for crossing the river, so there are several solutions. One solution is given in Annex 11.)*

*Exercise: How can the height of a high building be determined using a barometer? Look beyond the obvious and try to find ten different methods. (Some suggestions can be found in Annex 11.)*



*Exercise: Make an analogy between an office stapler and your life. (In other words, complete the sentence: "My life is like a stapler in that...") There are some suggestions in Annex 11..*

*Exercise: Group the following six items into two groups of three such that each group has something in common, that excludes the items of the other group: - (1) needle and thread, (2) pocket calculator, (3) balloons, (4) shell, (5) vase, (6) suitcase. (There are many possibilities, but some examples are given in Annex 11.)*

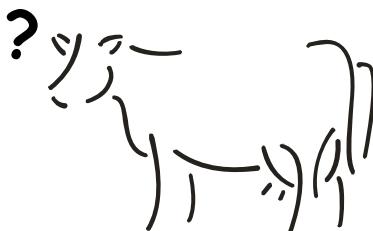


*Exercise: Make a list of things that can be done with a paper clip. (It is estimated that 90% of all paper clips are not used for their intended purpose.) The start of this list can be found in Annex 11.*

*Exercise: Salmonella poisoning has been discovered in products coming from a tinned food factory. How could paper clips be used in the action that would be needed to protect public health? (There are some suggestions in Annex 11.)*

These exercises may seem trivial and not related to water supply and sanitation, but they do illustrate the need to get out of the usual track and look for a range of solutions, rather than being content when we have identified one. They show that it is possible to approach a problem in different and unusual ways, so that we think more deeply about the issue itself and its context.

### 3.7.4 Questioning "sacred cows"<sup>8</sup>



If we question a generally accepted rule, norm or belief, this does not mean that it is wrong or invalid, but this questioning opens up our thinking to new solutions and new understandings. By considering the converse to an accepted rule, we can often see more clearly why it is important and worthy of general acceptance, and appreciate the importance of this rule more clearly.

Alternatively, we may find that, though the rule was introduced for very good reasons, conditions have now changed, and the rule is no longer needed or helpful.

*Example: We often hear the rule "The customer comes first". What would happen if this rule were overturned, and the shop assistant was given the higher importance? (For example, if there are two competing products on the market at the same price, but one is markedly inferior to the other, would a shop be justified in stocking only the better product, even if some customers might choose the inferior alternative, perhaps because of the design of its label? Or should the choice of the customer always be given preference?)*

*Example: It was the custom in an American family always to cut off the feet of a turkey before it was put into the oven. The reason was not known, but it was assumed to be linked to the taste. However, some informal research showed that this was initially done simply because a big bird did not fit into a small oven without its feet being cut off. There was no reason to do this if the oven was big enough for the bird with its feet.*

Some rules continue to be valid and others are no longer necessary. The wise know which rules are in which category.

---

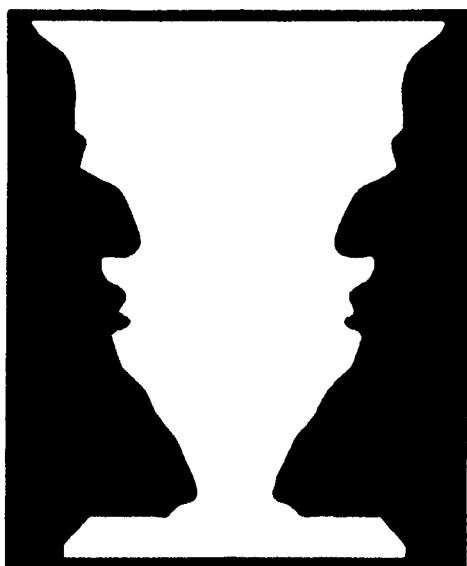
<sup>8</sup> In this context the term "sacred cow" means a belief or a norm that is accepted to be true and valid without challenge or question. For example, there may be social pressure to accept such a belief, even though its basis is not known.

### 3.7.5 Figure / ground reversals



This picture can be seen into two ways. Some people, when they see this picture, immediately see a well-dressed young lady looking away and towards the left. Others see an old lady looking down and towards the left foreground. After a time it is usually possible to see both. (Modifications to the picture in Annex 11 may help the reader to see both ladies in the picture.)

This picture illustrates the point that two people may see the same picture or problem or issue in different ways, and with practice or help we can be enabled to see what the other person sees.



This picture illustrates a figure / ground reversal. The *figure* is the object at the centre of the picture, the foreground. The background is here termed *ground*. The picture shows an ornamental vase for holding flowers. The background is dark. Someone else may disagree, saying that the picture obviously shows two men (probably twins) looking at each other. The part that was the *figure* for the first observer becomes the *ground* for the second, and vice versa. Both observers are right. When someone looking at the picture is able to see both images, they are able to reverse or exchange the *figure* and the *ground*.

#### Figure / Ground Reversals

- That part of reality that one is paying attention to is the "figure".
- How about the "ground" (= context) ? Is it falling off?
- How about swapping the "figure" and the "ground" when you have to solve a problem?

This picture can help us understand how a problem can be seen in two ways. A figure / ground reversal is helpful in analysing a problem because it helps us to see it in another way, perhaps seeing the problem as someone else sees it. If we take what we consider to be the background to a problem, and make it the focus of our attention, we may have found a new and helpful way of understanding a situation better. This will be illustrated from the case studies in Chapter 5.

Alternatively, it may be a question of listening. When someone is explaining a situation to us, they usually concentrate on what they consider to be the focus of attention (*the figure*). To determine what is the *figure*, the listener can ask questions about the presenter such as

- ◆ What is (s)he trying to do?
- ◆ How does (s)he do it?
- ◆ What is his/her motivation?
- ◆ What aspect is most prominent? What is frequently mentioned?
- ◆ Who benefits most from the current arrangements?
- ◆ Who or what is the centre of attention?

As we listen carefully, we may understand the actors, entities or items that are omitted from the explanation - what the presenter considers to be peripheral or the background – because the presenter regards them as not important. This indicates what the presenter regards as important and what (s)he disregards. It may be helpful to reverse the presenter's assessment and give importance to the background, that has been omitted in the description. This can sometimes be observed when two people are having an argument. Each person highlights what is important to them, and it often happens that one account is a figure / ground reversal of the other – the facts that are emphasised by one are ignored by the other.

If the figure and ground are reversed it is as if the items or individuals that are ignored in the project under consideration become the focus or centre of another project.

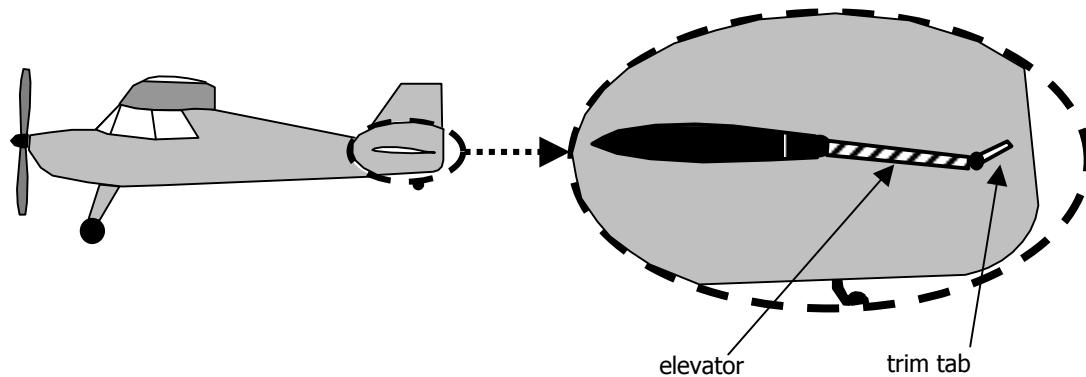
In modern European society, it could be said that young people are the foreground, the *figure*, and old people are the background. This can clearly be seen in advertising and in many television programmes. The reverse may be true in many traditional societies where the elders have the prominence.

object = figure = content

background = ground = context

The background can also be referred to as the context. For example, if the subject of divorce is being discussed, the context would be what the speaker understands by marriage, what being married means to her/him. If we can understand this context, it will be of considerable help in understanding the content - what is being said about divorce. If there is a quarrel concerning access to an irrigation well, it may be important to understand the context, which would include laws and customs about water and agriculture, the climate and hydrogeology, and the history of the area, and so it would be useful to focus attention on this background or context, before returning to the content (the issue being debated).

### 3.7.6 The trim tab factor



An aeroplane is made to point up or down by raising or lowering the elevators at the back of the aircraft. Along the rear edge of the elevators are trim tabs, which are used to keep the elevators in the correct position for the particular load that the aircraft is carrying. The trim tabs are very small, but if they are not set correctly, the pilot must fight against them all the time to keep the aircraft at the correct height.

Returning to tools for modifying mindsets, the *trim tab factor* is whatever is needed to be adjusted so that the project can move forward in a satisfactory way. It may be very small. It is the one fact, mindset or component that makes all the difference to the progress of the project. It is often easier to identify in hindsight, (i.e. when looking back). It is the factor that allowed the project to become successful. If the *trim tab factor* is correct, the energy and effort required are less.

*Example: It was discovered that microcredit schemes were more successful in some cases than others. It turned out that when money was loaned to women, they used all of it to benefit their families, whereas when it was loaned to men , they kept 60% for themselves, and used only the remainder for the family. The trim tab factor, that enabled the project to be more successful, was to loan money only to women.*

### 3.7.7 More exercises by the lake

*Exercise: Observing and describing We were asked to observe only three items very closely so that we could describe them precisely.*

Often we do not really see what is around us. It is sometimes useful to look at things or phenomena that are familiar or close to us in a careful and thorough way, because we may think that we know them well when in fact we do not.

*Exercise: Walking and feeling We were asked to feel with our feet, concentrating on what we could learn from our sensations of touch.*

We make most use of the senses of seeing and hearing, but it is useful to be aware of new ways of receiving information.

*Exercise: Equidistant leaves. We were asked to place four leaves so that they were at equal distances from each other.*

This could not be done if we retained the assumption that all four should be on the same plane. Once this unnecessary assumption was abandoned, it was possible to locate the four leaves in the grass so that they were at equal distances to each other.

*Exercise: Guide for a blind person. We divided ourselves into pairs, and one was asked to keep his/her eyes closed while the other guided him/her around the lakeside garden, where there were steps, narrow paths, low overhanging branches, and the possibility of falling into the lake. After a few minutes, the roles were reversed. Then we were asked to describe our feelings and impressions.*

Some of the comments about this experience:

- (Applying the experience to development co-operation) In some communities there is a lack of information, vision and know-how, so that they are not able to move forward. If they are guided well, their trust in their guide will grow.
- After being “blind”, one is a more sympathetic guide.
- Close contact, such as the firm grasp of an arm, builds confidence.
- Verbal instructions and explanations also build confidence and make it easier to avoid problems. If the guide stops giving information, the “blind” person might try to find his/her own way.
- It is helpful if we are familiar with the area and know where we are going.
- Sometimes we gain in confidence and would like to try a few steps without assistance.
- It is sometimes difficult to know when to offer help to a blind person, and when such help would be regarded as patronising or unwelcome.
- It is important for the guide not to lose concentration in their task.

### **3.8 Applications in the rest of the workshop**

It takes some time and effort to really understand and use the concepts and tools that have been presented in this chapter. Skill in using them comes from practice. Therefore participants were encouraged to look for paradigm shifts and use the tools and methods from this chapter to develop new paradigms and consider their implications. There was also the question of how to express a paradigm – is it the same as an instruction or a warning?

Consideration of paradigms was on two levels. Participants were asked to consider individually the paradigms that guided their private lives, such as family relationships. Participants also worked in groups, first to discuss paradigms in public opinion and in development co-operation (Chapter 4), and then to consider paradigms in particular cases (Chapter 5).

## Chapter 4      Outputs of cultural working groups

### 4.1      Introduction

Little research on paradigm shifts appears to have been done in African and Asian contexts. This workshop presented an ideal opportunity to explore whether the concept of paradigm shifts was seen as useful and relevant by participants from Africa and Asia, and to suggest some paradigm shifts that had occurred in these continents. At the same time, participants from Europe were invited to identify the paradigms that had influenced development co-operation in recent decades.

### 4.2      African group

presented by Lukman Y. Salifu

- ◆ There has been a shift of emphasis from political independence to economic independence. Previously the belief was that political independence would be enough for the people to achieve their goals, but now it is seen that economic independence is also necessary. Botswana provides an example of a country that is gradually improving in the economic sense, indicating that with good leadership a turnaround is possible.
- ◆ Another trend has been the emerging acceptance of democratic structures and decentralisation. South Africa has shifted from racism. There have been smooth hand-overs of power resulting from elections in Senegal, Ghana, Uganda and some other countries.
- ◆ There are trends towards privatisation and globalisation, but in many cases they are driven by external forces.
- ◆ There have also been changes in traditional values. Two generations ago it was common for men to have 20 to 30 children, but now families are much smaller. This may be because of financial pressures (such as the cost of schooling) or a change of beliefs.
- ◆ Corruption had its roots in the colonial era, when there was a huge disparity in wealth, and the poor sought to take possession of as much as possible in the name of Africa. There is a need for a paradigm shift to see that public and company resources are for collective benefit.

There was not unanimous agreement about whether the changes mentioned here were results of paradigm shifts. Some believed that since the pressure for democratisation and privatisation was not coming from within the nations concerned, and the smaller size of families was a result of financial hardship, these did not represent paradigm shifts.

### 4.3      Asian group

abridged from a report by Joseph Halder

The group agreed to concentrate on political issues.

- The remoteness of government. Abraham Lincoln spoke of his ideal of "Government of the people, by the people, for the people". To modify this dictum, many in Asia feel that their government is "off the people, 'buy the people, and far(from) the people". However, there is a trend for governments to become closer to the people and more accountable. The people are becoming more aware about their country's situation, position and interests and about the bad intentions of some politicians. This increased awareness could be leading to a paradigm shift.

- Decentralisation and devolution are evident in many countries. In some countries authority has been shared down to the community level through the election of local leaders. This also suggests a paradigm shift.
- Election fraud is declining as the electorate becomes better informed and the media play a more active monitoring role. Corruption is being exposed.

## 4.4 European group 1

### **Review of paradigm shifts in development**

based on a report by Bernhard Fischer

One of the first shifts was from straightforward technology transfer to appropriate technologies. Then the approach became more country-based and the socio-economic dimension was added. Then the trend was more towards privatisation, with the provision of only budget support. More recently project planning has tried to bring in all these components, integrating many inputs, including gender and other social issues, and community-based. In reality the results are not as comprehensive as they appear, and depend very much on the individuals concerned. In general it is difficult to say if there has recently been a paradigm shift or whether the main change is in the words that we use.

Different actors have their own specialities – churches have good links to the grass roots, but their approach may have stayed the same for twenty years; NGOs are interested in development business, not just in meeting basic needs; the World Bank deals with national governments and so has less contact with civil society.

Many different motivations are at work: -

- ◆ The desire to help (and perhaps to ease a guilty conscience about disparities in wealth and lifestyle);
- ◆ The need to spend financial allocations within the predetermined time schedule;
- ◆ The need to write what the client wants to read.

Current paradigms include an emphasis on "soft" methods, such as training and social mobilisation, which require a long time and comparatively low rates of expenditure. Too often success is still evaluated on the basis of expenditure.

## 4.5 European group 2

contributed by Hedi Feibel

Senior experts started with the statement that 10 or 20 years ago "we knew how, where and what was important in a project, we were transparent and authentic, the conditions were clear - also for the partners; whereas today all this is not so clear any more..." Probably this statement is linked to the professional experience of the individual speaker and "new-comers" start with the same enthusiasm, confident that they know which is the right way. In this way paradigms give a certain security, as they can create a sense of authenticity and transparency. They also promote stability and fair co-operation with the partners in the project (since they know what to rely on).

Nowadays, more actors are involved (e.g. because the partners became stronger and more active) and in addition more information is available for all of the stakeholders. These might be reasons for paradigm changes becoming more frequent and quicker. (As one member remarked: "Some years ago, paradigms were discussed after you had been in a project for 1 or 2 years, but nothing changed

for you, because, you did not get additional information during that time"). But this "inflationary fluctuation" of paradigms was regarded by the group to be negative because paradigms are important, affecting us entirely and fundamentally. In general every paradigm shift (or at least doubts about existing paradigms) seems to cause trouble, but consideration of paradigms can also be seen as a chance to examine, and probably modify, convictions and beliefs.

Some decades ago development aid was discussed more politically and ideologically. Today the political objectives have changed so that economic aspects and the migration and refugee problem (e.g. in Austria's development co-operation) are mentioned as main reasons for financial support. The group wondered if it is not a form of prostitution to accept this rationale, even if it is used only for fund raising.

Further aspects discussed were:

- ◆ a general statement that nowadays, we do not have sufficient space or time to discuss paradigms in daily project work. The paradigms are never really considered or questioned,
- ◆ confidence in the state, i.e. the government.

## 4.6 European group 3

contributed by Franck Bouvet

### **Changes of paradigms in development : the historical background**

- ◆ Until 1960, development workers considered themselves as pioneers knowing the best methods for development and the needs of the population.
- ◆ 1960 – 1965 : technical assistance was promoted, given purely technical expertise. This was the period of turnkey projects.
- ◆ 1965 – 1970 : Sociological expertise was brought in to help the development specialist to understand the context in which he is working.
- ◆ 1970 – 1975 : It became obvious that development specialists should not be involved practically in the field, but should rather give advice to national and local government.
- ◆ 1975 – 1980 : integrated projects must be set up and carried out in order to develop the capacity of the local institutions and communities.
- ◆ 1980 – 1990 : Institutional building needed strengthening by good governance practices. Linked to this new paradigm, the promotion of women (the gender issue) was seen as essential.
- ◆ 1990 – 1995 : Decentralisation became the new paradigm.
- ◆ 1995 – present: Privatisation of public services was advocated to increase the efficiency of the services provided by local authorities for the populations.

### **Finding new paradigms:** - each individual has her/his own.

New paradigms were identified according to the belief of each member. Examples were: -

1. More transparency is necessary and a better understanding of the relationship between donors, NGOs and beneficiaries (especially uncovering of hidden agendas). NGOs should intervene upon the request of the local population and under their specific control.
2. Transparency in the flow of funds should be sought. New financial mechanisms are needed for transferring funds.
3. Everything should come from the grass roots. Individuals should be at the centre of development projects.
4. Creating of favourable conditions is a must to create confidence and set up successful projects.

#### **4.1.6 Discussion**

A number of suggestions were proposed for paradigms that should be used for development work:

- ◆ Everything should come from the grass roots – from the individual, through the family, through the community – the household-centred approach.
- ◆ Projects should be designed according to the wishes of the counterpart (but the projects must suit the donors also).
- ◆ There is a need for more transparency. Donors and NGOs often have hidden agendas. Donors sometimes change conditions and rules without referring to partners. Development work should be separated from assistance to the poor. When donors give things free it is very difficult to subsequently introduce cost recovery.
- ◆ Projects should no longer invest in technologies, but aim to create conditions that favour the processes of learning and collaboration at all levels, so that actors can increase their activity, responsibility and confidence.
- ◆ Economic regulation mechanisms are need to balance poverty and wealth, and transfer of funds should be according to financial mechanisms.

## Chapter 5 - Practical applications – the case studies

### 5.1 Review of the general process of the group work

#### 5.1.1 First assignment in case study groups

The first objective for each group was for the presenter to make the members familiar with the key points of the particular case study, so that they would be aware of the basic paradigms.

Then each member was asked to consider the case from the perspective of his/her second choice career, that had been mentioned by each participant at the beginning of the workshop. (See also Sections 2.4 and 3.7.2.) Next, the groups were to consider what is the focus of their case study, and what is regarded as the background, and reverse them, as is discussed in Section 3.7.5 – *figure / ground reversals*. The final assignment for this session was to compare the key point of the case with a stapler (as introduced in Section 3.7.3). The results of each group were to be presented the next day on one or two charts.

#### 5.1.2 Initial reporting back

After some further instruction on figure / ground reversals, participants returned to their groups to finish their preparations. They were advised not to expect to finish their deliberations – since these issues are not quickly finalised, but that the presentations should be ready to reflect the state of discussion at that point.

These initial presentations are summarised in Sections 5.2 to 5.6, where all the stages of the discussions of one case study are presented before starting on the next case study.

#### 5.1.3 Second assignment in case study groups – identifying and challenging paradigms

The groups were now asked to look at their cases and identify the paradigms that led to the activities of the case study being planned and conducted in the way they were. (Examples of such paradigms could be "Big is beautiful" or "All wastewater should be treated".)

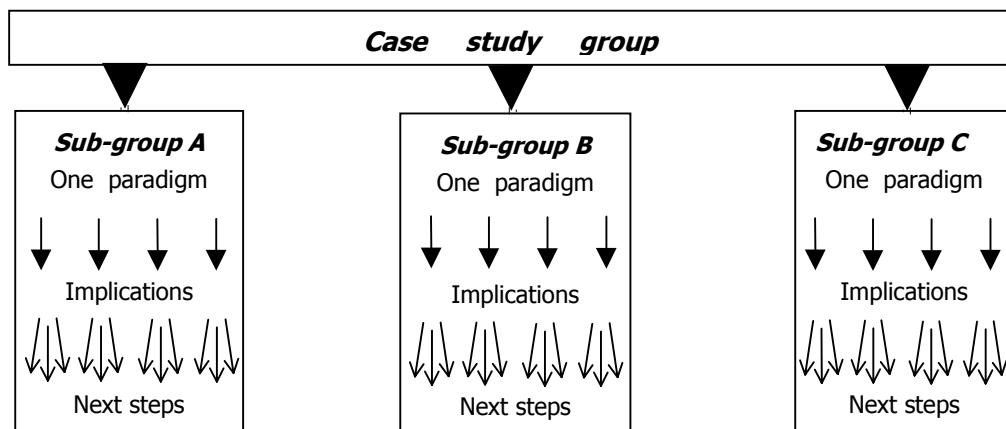
When each group had made a list of apparent paradigms, each group was asked to move to another case study, and look at the paradigms that had been proposed to account for the development of that case study, as listed by the group assigned to that study. The groups were then asked to challenge the paradigms that they found. Challenging a paradigm might mean proposing the opposite (e.g. "Small is beautiful") or it might mean qualifying or reformulating an original paradigm (such as "Big is more economical" or "Only hazardous wastewater should be treated", or "Wastewater is useful for irrigation", or "We can no longer afford to treat wastewater" or "Wastewater is a resource that should not be wasted".) Only the most interesting paradigms should be considered.

Tonino Zellweger explained that this method of approaching a particular case as an outsider, and stepping back, can be helpful in reviewing the thinking processes that guided the original planning, and proposing alternative paradigms which can lead to new strategies.

#### 5.1.4 Third assignment in case study groups – building on paradigms

The groups then returned to the case studies that they had originally selected. The next task was to choose the three most promising paradigms and use them to consider their implications and the next

steps that should follow the adoption of these paradigms. Because of the amount of work involved, each group was advised to split into three sub-groups, each group considering one paradigm.



There was some discussion about the choice and formulation of the paradigms. The first paradigms to be identified by the groups were an attempt to describe the thinking of those who formulated the case study project in its current form, and so were not necessarily seen by the group as appropriate or recommended for the future. The challenges to these paradigms were offered by another group that had little understanding of the background and situation of the particular case study. Therefore, neither set of paradigms might be regarded as useful or appropriate for a new (revolutionary) formulation of the project activities. Therefore some modification of the available paradigms was regarded as acceptable so that group members were able to accept and use them.

The work of each case study group will be presented in the following sections. The order of the case studies is the order in which they were initially introduced.

## 5.2 Water supply after more than twenty-five years – a case study from Cameroon

presented by Numfor A. Esther;

### 5.2.1 Introduction to the case study

This case study concerns a village called Sop in Cameroon which was provided a gravity-fed water supply 25 years ago. It reviews the social processes currently taking place and attitudes to the water supply. The current objectives are to upgrade the system and to solve problems relating to operation and maintenance.

Cameroon has a population of 15 million, of whom 55% are rural. It is estimated that only 27% of the rural population have access to a satisfactory water supply.

The piped supply system in Sop was implemented by many stakeholders at national, district and community level, including Helvetas. Asbestos cement pipes were used, but they have been attacked by the aggressive water and some need repair and replacement. However, asbestos-cement pipes are no longer manufactured so ways must be found to make repairs with plastic pipes. The construction of the system was successful, but the provisions made for ensuring effective management of the operation and maintenance were not successful.

The current centralised Government organisational system is unable to provide sufficient support to ensure good operation and maintenance in the villages, so efforts are being made to involve the community in these functions through monitoring and the creation of social processes. Current challenges include the inability and unwillingness of the community to take on new responsibilities.

The Village Water Committee is responsible for collecting an O&M fee from the villagers.

Before the system was implemented the villagers were using polluted water from a stream. Since the spring-fed supply has been in operation the villagers have enjoyed better health because of the better quality of the water and the convenience of the supply. If the system should fail, their health would again be at risk.

The community made a substantial contribution during the construction of the scheme, but this contribution a generation ago does not necessarily result in a current sense of ownership that motivates the villagers today to take responsibility for operation and maintenance.

More background information can be found in Annex 5.1.

### **5.2.2 Wearing another hat – the perspective from second choices for careers**

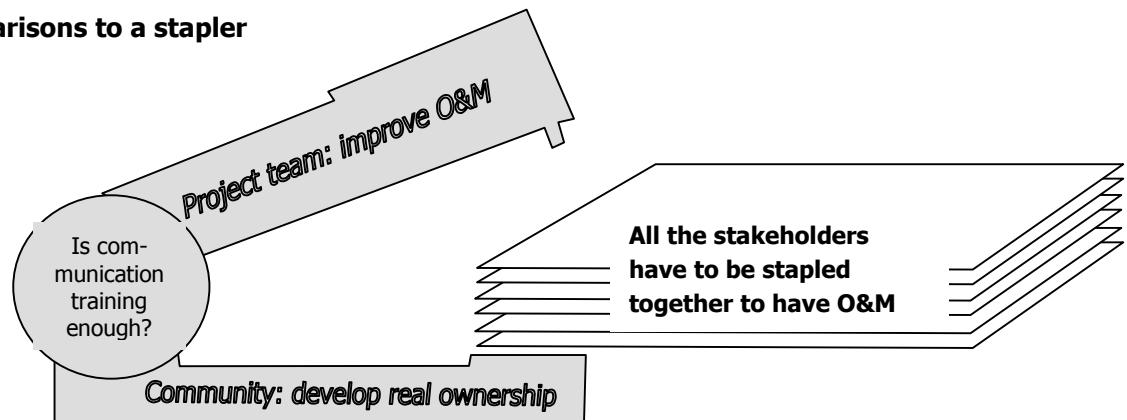
(See section 5.1.1 for an introduction to the steps in Sections 5.2.2, 5.2.3 and 5.2.4.)

<b>Profession</b>	<b>Opinion</b>
Vineyard owner	The water is too expensive. The water should be marketed to promote a greater understanding of its value.
Farmer	The farmers do not have sufficient income to pay their water bills. The water has been flowing from the taps for years – why should I now start to pay for it when it has been free for so long?
Farmer	The water flows downhill without any pumping, so why should I pay for it? If I could get some extra water that would allow me to grow vegetables, I would be prepared to pay a fee for it.
Lawyer	It is the government's duty to provide these necessities for us. What right in law has the village water committee to collect a fee from the villagers? Is there a constitutional provision for this?
Nurse	While the system is working the water is safe to drink, but what happens if there is a breakdown of the system? Many people would become ill. How are women involved in the decision-making processes?

### **5.2.3 Figure / ground reversals**

<i>Figure - Attention is focused on: -</i>	<i>Ground - Left in the background: -</i>	Action to reverse
Regulations and checklists provided from outside	The Rural Council	Rural Council to have monitoring and controlling function, and to enforce byelaws and water act
The community does the monitoring	Traditional decision-makers (Chiefs)	The authority of the traditional chief should be used.
Changing the habits of the community through social processes	Committee members have not been involved or motivated, and their status has not been recognised.	Improve the status of committee membership with non-monetary incentives and benefits
Part-time caretaker is paid and so is motivated.	Motivation of community, reluctance of community to take responsibility, lack of clarity on ownership	Establish and enforce water policy and byelaws at regional level.
Water has been flowing for 25 years	Asbestos-cement pipes are failing & need replacement	Rehabilitation should be undertaken according to mutually agreed conditions
Communities have been trained in management.	House connections confer many benefits Water-related health risks have been minimised	

### 5.2.4 Comparisons to a stapler



Other suggestions:

- ◆ Getting the community motivated for O&M is like a stapler that has to be pushed down hard every time to do its job.
- ◆ The messages of essential factors should not be so many that the staplers cannot join them all.
- ◆ To get the government system involved in O&M is like getting a corroded stapler to work again – it needs both a hammer and oil.
- ◆ The role of government should be like the function of a stationery shop that sells staples. Government can provide support, funds and the legal framework.
- ◆ The local authority structure is like a stapler when the papers to be stapled are removed before the jaws of the stapler are pressed together.
- ◆ After 25 years of operation, a stapler is worn out and should be replaced.

### 5.2.5 Paradigms and challenges (See Section 5.1.3 for a brief explanation)

Paradigms proposed by case study group to describe the design of the existing project	Challenges and revisions proposed by another group
<p>Water supply issues must be solved at community level</p> <p>Each community should be responsible for its water supply</p> <p>The community is best suited to manage and implement O&amp;M</p> <p>A partnership between the community and government, with the community in the driving seat, is the best arrangement for O&amp;M.</p> <p>The limits to the support that can be expected from different stakeholders should be made clear.</p> <p>The community should guarantee that maintenance will be done.</p> <p>All actors should come together around one table</p> <p>Communities can be motivated through a social process facilitated from outside</p>	<p>Water supply issues must be solved at household level.</p> <p>The responsibility for O&amp;M needs to be decided in each case</p> <p>Dedicated individuals can trigger or motivate good maintenance.</p> <p>The different interests of different actors should be acknowledged.</p> <p>The motivation of communities is only a small step towards – and does not guarantee – good maintenance. (<i>Selected as crucial point</i>)</p> <p>Water supplies alone do not solve health problems.</p>

Paradigms proposed by case study for future development	Challenges and revisions proposed by another group
The private sector is better equipped to implement O&M.  Local leaders are important  The role of local government should be acknowledged	The private and public sectors should work together to implement O&M.  Respected and legitimate initiative leaders are important  Local government must be supported  Government interference has negative impacts

### 5.2.6 Output of Subgroups

(See Section 5.1.4 for a brief explanation of this step.)

#### Subgroup A

**Paradigm There can be no sustainability without a clear and established institutional and policy framework**

<b>Institutional actors</b>	Traditional Chief (traditional council)	Rural Council (local government, covers ten villages)	Water Management Committee (one in each village)
<b>Tasks</b>	To make the decision to reorganise the project structure  To sanction the use of water according to traditional laws	(A Water Act should be enacted by higher authorities.) The Rural Council should apply this Water Act.	To present the needs and concerns of the people they represent at committee meetings
<b>Benefits</b>	The Chief's authority should be recognised by all actors.  There should be opportunities for the Chief to present his experiences to conferences etc.  An invitation to an Aguasan Workshop'.	The Council should receive a percentage of water-related revenues.	There should be a competition between different parts of each village to reward the part that pays the highest proportion of the water charges.  Prizes could be chickens or assistance in constructing latrines.

**Subgroup B**

<b>Paradigm</b>	<b>Social mobilisation is the key to the sustainability of water supply systems</b> - The community should be involved right from the outset
<b>Implications</b>	<b>Next steps</b>
Bringing together the whole community – existing and potential users and others	<ul style="list-style-type: none"> <li>• Involve the traditional leadership</li> <li>• Determine and facilitate processes within the community</li> <li>• Assist the community to determine the qualities needed in WMC members</li> <li>• Assist the community in the formation of an effective WMC</li> </ul>
Sense of ownership and commitment to contribute	<ul style="list-style-type: none"> <li>• Advocacy for a clear water policy</li> <li>• Build community confidence through small activities</li> <li>• Facilitate establishment of an O&amp;M fund</li> <li>• Encourage regular contributions to O&amp;M fund</li> </ul>
Strengthen capacity of WMC for general management	<ul style="list-style-type: none"> <li>• Management training and exposure</li> <li>• Training on contracting private sector</li> <li>• Training on financial management and accountability</li> <li>• Orientation on water policy if and when available.</li> </ul>
Sustainability of the Water Management Committees	<ul style="list-style-type: none"> <li>• Assist community to formulate the WMC constitution</li> <li>• Consider incentives or rewards for WMC members</li> <li>• Advocacy for legal status for the WMC</li> <li>• Community audit (as required by constitution)</li> </ul>
Mechanisms for linkages between the stakeholders (WMC, Rural Council, T leaders, private sector, donors etc)	<ul style="list-style-type: none"> <li>• Advocacy for a clear water policy</li> <li>• Roles and responsibilities of the secondary stakeholders (clarity)</li> <li>• Support Rural Council and WMC to negotiate for central resources and specialised services</li> <li>• Identify backstopping mechanism – Rural Council?</li> </ul>

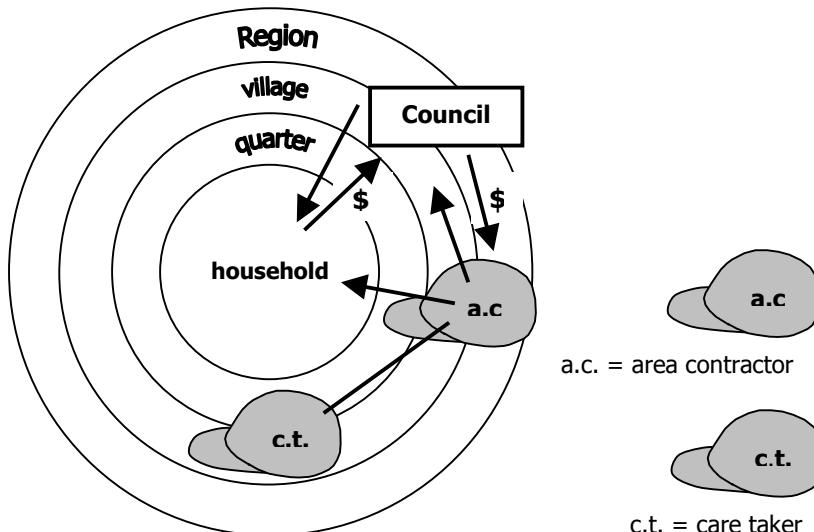
**Subgroup C**

<b>Paradigm</b>	<b>Social mobilisation – to achieve implementation of O&amp;M by the community – cannot be facilitated from outside</b>
<b>Implications</b>	
	<ol style="list-style-type: none"> <li>1. Establishment of new organisational structures <i>(Four scenarios were developed for this implication. The fourth scenario was favoured by the case study presenter. This last scenario envisages a group of committed householders who have house connections taking the leadership in managing the village water supply. Notes following the presentation of the fourth scenario give more information.)</i></li> <li>2. Establishment of appropriate legal framework</li> <li>3. There will be no further external inputs – the community must find its own way.</li> </ol>

**Paradigm** Social mobilisation – to achieve implementation of O&M by the community – cannot be facilitated from outside

**Implication** Establishment of new organisational structures

- Scenario 1a** Council with treasurer controlling  
Area contractor, with caretaker – caretaker does basic O&M, area contractor does more advanced O&M
- Scenario 1b** Council controlling  
Area contractor with caretaker – water tax collection, O&M implementation  
(Scenarios developed from the Household-centred Approach)

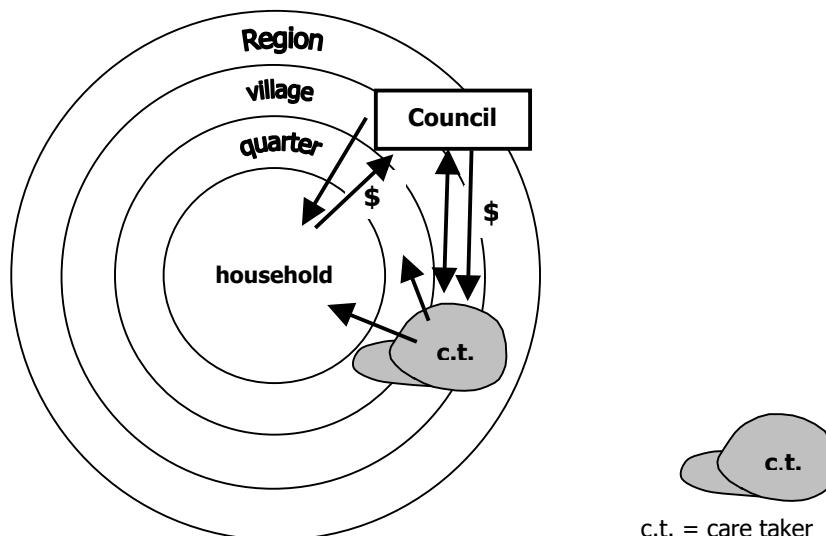


Potential Clear supplier-client relationship  $\Rightarrow$  direct control, especially if competition is established

Risks Council beyond control

**Implication** Establishment of new organisational structures

**Scenario 2** Council takes charge, employs caretaker



Potential Very effective if Council operational

Risks Council beyond control; high dependency on Council

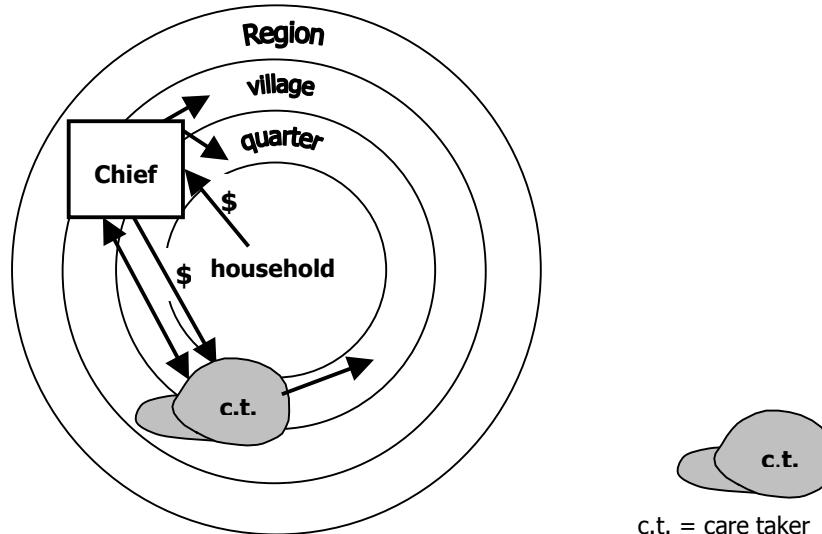
---

**Implication** Establishment of new organisational structures

---

**Scenario 3** Building on traditional authority

Chief = patron; caretaker employed



c.t. = care taker

---

Potential	Uses existing traditional structure; clear, straightforward hierarchy, particularly appropriate in remote areas
-----------	---

---

Risks	Dependency on personality of chief (monopoly); Chief's power is likely to deteriorate with time
-------	---

---



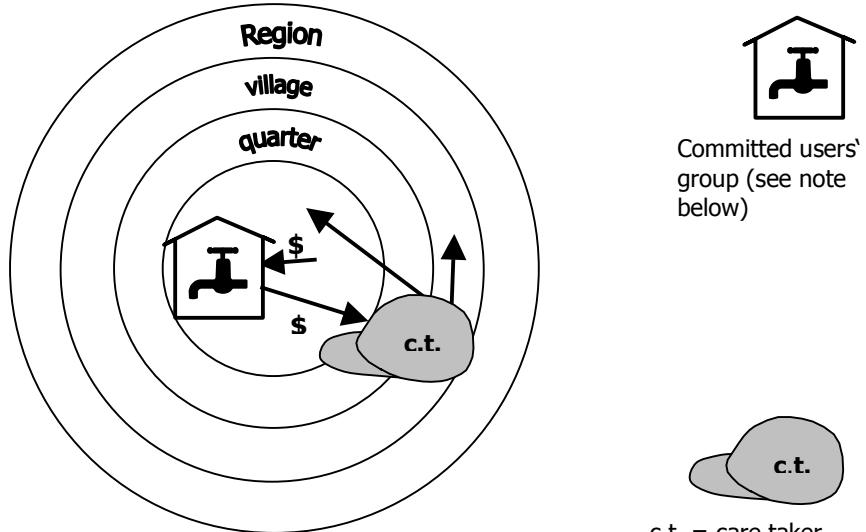
---

**Implication** Establishment of new organisational structures

---

**Scenario 4** Leadership by committed users' group (*See note below for explanation.*)

Caretaker employed



Committed users' group (see note below)

c.t. = care taker

---

Potential	The number of committed users is increasing.
-----------	--

---

Risks	Committed users' group may modify arrangements to suit their own interest, so appropriate byelaws are needed.
-------	---

---

#### Explanation of scenario 4

In many villages there is a group of residents who have a particular interest in the effective operation of the water supply system. Such people may have retired to their family village after working in a

city for many years, and so they are accustomed to having a regular supply of wholesome water, and regard such a supply as important. They may also have the financial resources, the education and the experience to take a leadership role within the village in ensuring the continuing operation of the water supply system. It is likely that such people will take advantage of any opportunity to have house connections, hence the symbol used to represent this group.

#### **Proposals for implementation of scenario 4**

1. Select a favourable location for a pilot project, where there is a strong group of "committed users".
2. Develop the legal and administrative framework in consultation with stakeholders.
3. Develop terms of reference for the caretaker.
4. Develop in a participatory way statutes for "co-operation" of committed users.
5. Establish a contract with "co-operation" to run the system for the next five years.
6. Monitor, learn, improve and adjust, and report to an Aguasan workshop.

### **5.3 Operation, Maintenance and Sustainability of Urban Services in Faisalabad, Pakistan**

presented by Shahid Mahmood;

#### **5.3.1 Introduction to the case study**

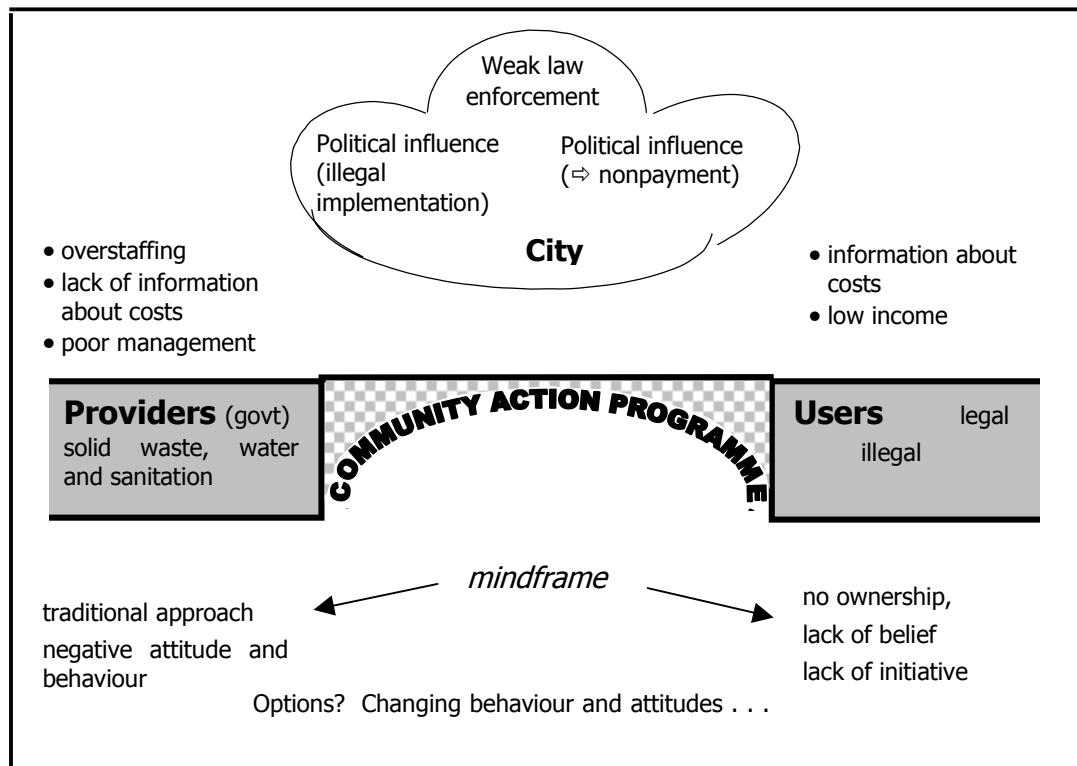
This case study was concerned with research into the attitudes and perceptions of a range of actors regarding the performance of a government body charged with operating and maintaining water supply and drainage facilities. The body is the Water and Sanitation Agency (WASA) of Faisalabad, Pakistan. The aim of the research was to find ways in which the sustainability of the sanitation services could be improved.

CAP, the NGO represented by the presenter of this case study, has been acting as a facilitator and intermediary between the communities and WASA,

The findings are discussed in more detail in Annex 5. Some of the main findings that were presented in the introduction were:

- ◆ there was overstaffing at the management level,
- ◆ there was a lack of information (for example, regarding the location of pipes),
- ◆ political influences were destroying community initiatives, by claiming that the city could do everything for the communities,
- ◆ implementation has not been in line with the Master Plan of the City,
- ◆ traditional approaches were being followed,
- ◆ the attitudes and behaviour of officers were not suitable, since they acted more like kings than servants of the public,
- ◆ users were not using the services properly – for example they were throwing solid waste down manholes,
- ◆ since the users were not satisfied with the service they were getting, they did not pay the charge, so the revenue for O&M was very low.

Some of these points are illustrated in the following chart, which is based on one that was prepared for the presentation.



### 5.3.2 Wearing another hat – the perspective from second choices for careers

(See section 5.1.1 for an introduction to the steps in Sections 5.3.2, 5.3.3 and 5.3.4.)

- ◆ There are no major problems
- ◆ I would cut a pipe to get more water.
- ◆ I will get my own borehole and set up a private water supply.
- ◆ I will educate my children to avoid illegal use, save water and use it carefully.
- ◆ I would motivate and organise professionals and other users.
- ◆ I would organise schools.
- ◆ I would join a self-help group to organise transport.

### 5.3.3 Foreground and background

The figure or foreground is CAP. The essence of this intervention is that communities are empowered to request and secure services by being organised. The project is about changing mindsets. If CAP did not exist empowerment of the community would take much longer.

The Muslim culture is a key aspect of the context.

The background to this project is WASA and the complex links that it has with the community and others involved in the supply of water and sanitation services. WASA is not connected to the political structure of the town. WASA personnel are civil servants who may not feel accountable to the people of the City. A metering system has been introduced but is not working, and many people do not pay their bills. Some officials get illegal money.

Other issues for further discussion are the partnership between the community organisations and WASA, the degree to which the communities have a potential for organising themselves, and ways in which WASA could become more effective, such as if it were commercialised and staff were paid better salaries.

### 5.3.4 Comparisons to a stapler

- ◆ If the staples in a stapler are not organised properly, the stapler will not operate; if the community is not organised well it will similarly not achieve much.
- ◆ There is a balance between the stapler (the users) and the thickness of the paper (the provider).
- ◆ The staples must be fitted in the stapler, otherwise the stapler will not work.
- ◆ The staples must match the stapler.
- ◆ Just as a stapler needs pressure from outside to make it work, so the O&M system needs external pressure to make it operate.
- ◆ One has to know how to operate a stapler – how much pressure to put on it to get the best results.
- ◆ Everyone operates a stapler in his own way.

### 5.3.5 Paradigms and challenges (See Section 5.1.3 for a brief explanation of this step.)

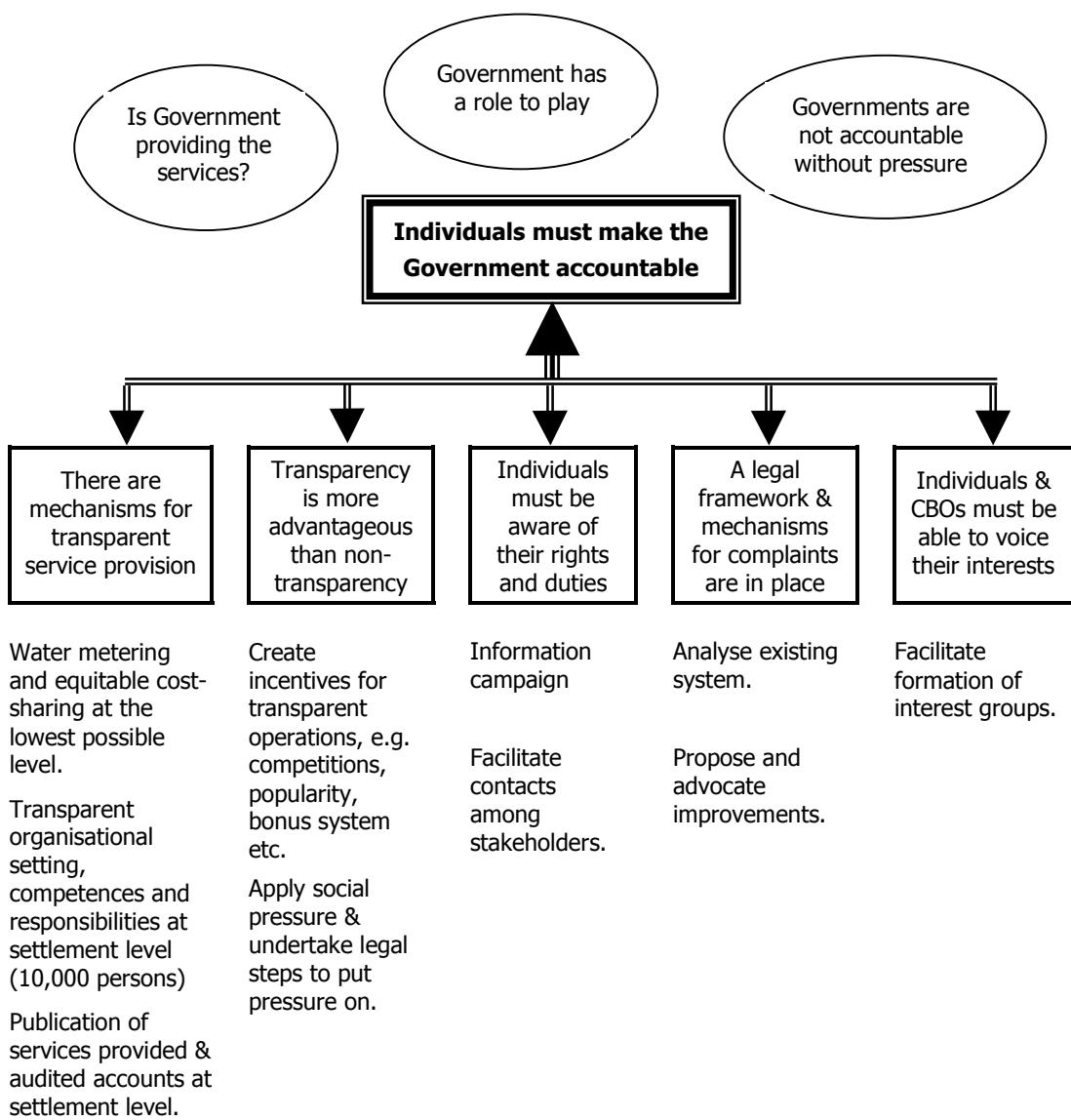
Paradigms proposed by case study group to describe the design of the existing project	Challenges and revisions proposed by another group
<p>We must help the poor. We must help the "grassroots". "People" need help.</p> <p>Partnership is the solution. Provider and user to work together. True partnership needed for success. Different people in the community will come together to develop common interest action.</p> <p>Every individual has at least some resource. The poor must be mobilised.</p> <p>Progress by empowerment. People's empowerment is the key to improvement.</p> <p>Women and children can be influenced to make a significant contribution to the process.</p> <p>Community organisation is the most effective way to get better services.</p> <p>WASA can be forced to provide better services by CBOs.</p> <p>It is possible to organise the community to get better services.</p> <p>Civil servants are bad.</p> <p>Governments are not accountable without pressure.</p> <p>Trust in institutions is important.</p> <p>Public assets should be cared for by all.</p> <p>People are the owners of the systems.</p> <p>Education for all.</p> <p>Education is a must to run the project on track.</p> <p>All community members need services.</p> <p>Public services (should be) available for all.</p> <p>NGOs are good.</p> <p>People are not organised. The communities are not organised.</p>	<p>We have to fight the rich.</p> <p>Poor people have potential.</p> <p>Avoid exploitation of poor women and children</p> <p>Organisation begins at the household level.</p> <p>Involvement of private sector increases effectiveness.</p> <p>Trust is good but control is better.</p> <p>Maintain provider-client relationship.</p> <p>Government is the owner of public facilities.</p> <p>No free service.</p> <p>Distinct services to distinct clients.</p> <p>All NGOs are not good.</p> <p>Each community has needs, clear rules, regulations, roles and responsibilities.</p> <p>Communities are organised in their own way.</p>

### 5.3.6 Output of Subgroups

(See Section 5.1.4 for a brief explanation of this step.)

#### Subgroup A

**Paradigm:** **Individuals must make the Government accountable**

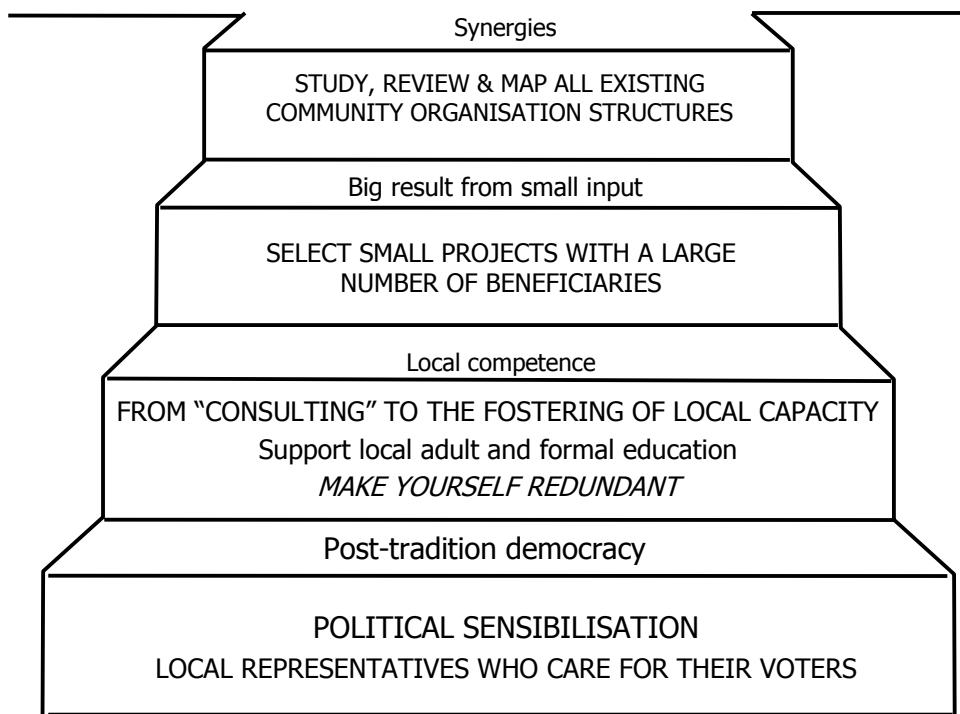


**Subgroup B      Paradigm:**      **Partnerships which create win-win situations are a precondition to the achievement of effective service delivery**

<i>Paradigm</i>	<i>Implications</i>	<i>Steps</i>	<i>The implications which require these steps</i>				
			<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
	<b>A</b> It is necessary that the interests and motivation of all actors are known	Identify actors who are affected and have more or less power over the problem situation.	■	■			
	<b>B</b> It is necessary that the constraints faced by the actors are known	Facilitate exchange / discussion between actors about problem situation.	■	■			
	<b>C</b> A platform needs to be available where the actors can negotiate their interests	Promote awareness-building and mobilisation / motivation of different actors.	■	■	■		
	<b>D</b> Competence and methodology need to be available to deal with conflicting positions	Facilitate the elaboration of an initial action plan based on commonly agreed points.				■	
	<b>E</b> Conditions must be created so that decisions & co-operative arrangements are made at local level	Identify conflicting positions and make transparent different agendas for debate & negotiation.				■	
		Identify and train potential 'mediators' to support bargaining processes.	■		■		
		Facilitate the debates (when necessary).	■				
		Support policy formulation which determines the roles and responsibilities of the actors at all levels.					■
		Provide capacity building support so that actors can engage in contractual arrangements.					■
		Facilitate on-going networking and sharing of experience.					■
		Secure communication and information dissemination.	■	■			■

**Subgroup C**

**Paradigm: Community organisation is the most effective way to get better services**



## 5.4 Franchise Management of Solid Waste Services in Ghana

presented by Lukman Salifu.

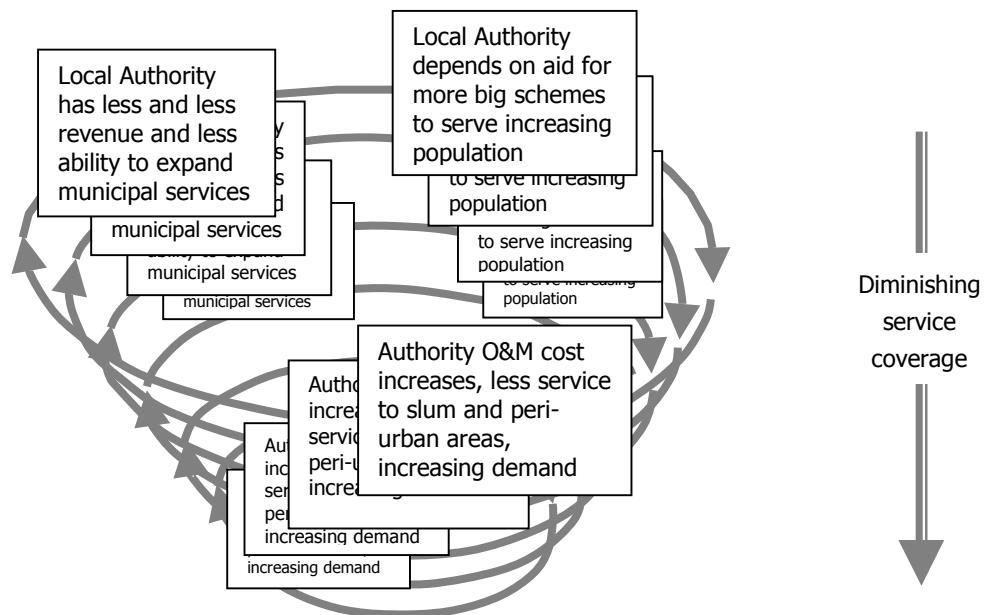
### 5.4.1 Introduction and background

This case study describes a pilot scale project for collecting solid waste in a low income neighbourhood in Kumasi in Ghana. The project was set up with World Bank assistance. This initiative follows the failure of conventional waste collection approaches, because of inadequate funding for vehicle repairs and replacements, which resulted in only partial service coverage, which, in turn resulted in low fee collection efficiencies (See Figure 5.1). In accordance with the trend for decentralisation and private sector participation, three franchisees were appointed to collect the waste from house to house using donkey carts. The arrangements and linkages are illustrated in Figure 5.2. The initial fee collection efficiency was 91%, and the service was well received. The project design included a declining subsidy payable to the franchisees in the expectation that fee collection efficiencies would initially be low. Monitoring of the franchisees (in financial and operational terms) was inadequate. Some residents complained about harsh treatment of the donkeys, so tractors and trailers have been introduced. More information is available in Annex 5. The City Authorities kept the responsibility for secondary transportation and disposal.

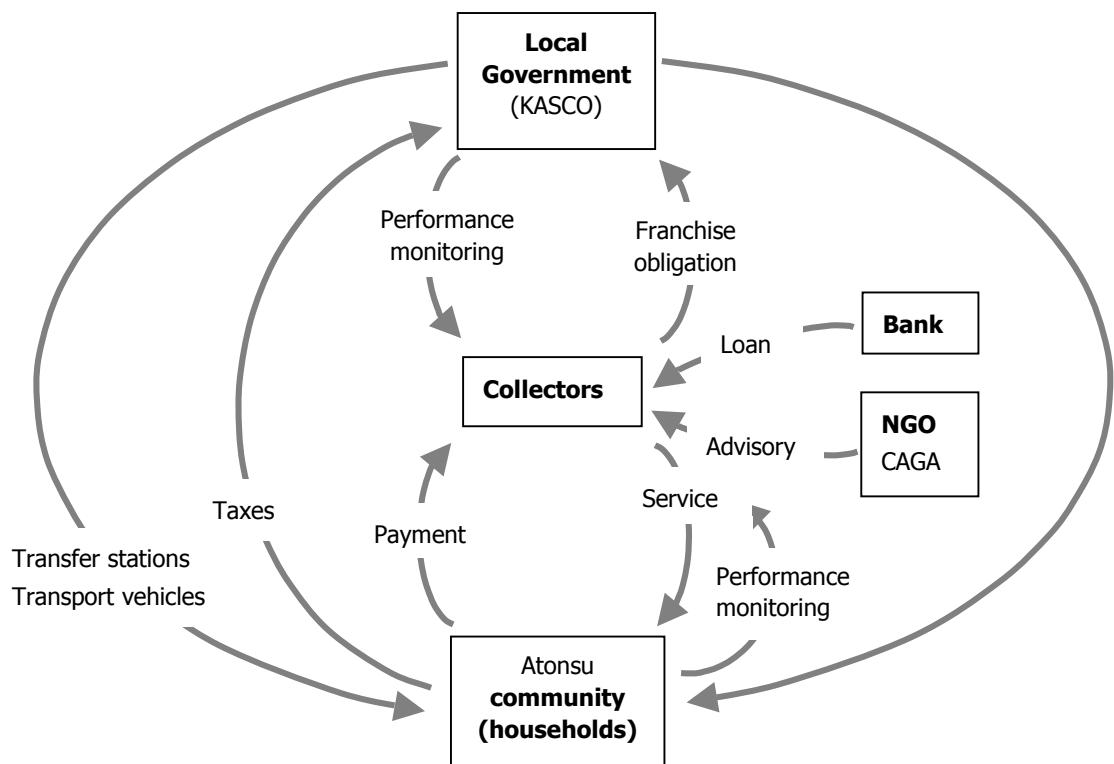
This pilot project already shows some paradigm shifts.

- ◆ Engineers usually prefer large machinery and to be seen to be in charge, but this pilot project uses small simple vehicles and gives the local community a greater role. The paradigm has shifted from "Big is beautiful" to "Small is smart".

- ◆ The choice of donkey carts seems to be reversing the direction of progress.
- ◆ Previously all municipal income had been gathered into a central pot, but in this project the private sector franchisees collect the primary waste collection fees themselves, and none of the collected money goes near the municipal Treasurer's Department.



**Figure 5.1** The vicious spiral that was the reason for the failure of the conventional approach to waste collection



**Figure 5.2** Arrangements and linkages of the franchise waste collection system, Kumasi

### 5.4.2 Wearing another hat – the perspective from second choices for careers

(See section 5.1.1 for an introduction to the steps in Sections 5.4.2, 5.4.3 and 5.4.4.)

Profession	Opinion
Farmer	Use organic waste for urban agriculture.
Mechanic	Tendering procedure should be more open, there should be more flexibility on technology choice.
Army officer	Use military resources to keep cities clean in peacetime.
Historian	Why privatised the primary collection but not the secondary?
Musician	There should be no subsidies.
Economist	Banks should provide loans for purchase of more equipment.
Medical doctor	Burn the waste to kill the germs in it (But this causes respiratory illness).
Medical doctor	Municipality should ensure good management of hospital wastes.
Economist	There should be no more subsidies.

### 5.4.3 Figure / ground reversals

Figure - Attention is focused on: -	Ground - Left in the background: -
Primary collection	Secondary collection, disposal, comprehensive waste management, reuse of waste fractions
The interface between the primary collection service and residents	The link between the primary collection service and the secondary transportation
The priorities of the municipality	The priorities of the community
Subsidies from taxes	Full cost recovery from beneficiaries
Operations of franchisees	Municipal roles and capacities
Collective waste management service	Individual responsibility for waste management
Solid waste collection	General urban planning and management

### 5.4.4 Comparisons to a stapler

Pictures showed

- ◆ A stapler with a great thickness of paper between its jaws so that there is no possibility of stapling all the sheets together – it is overloaded. This situation symbolises the Local Government in one picture and the waste collector in another.
- ◆ Another picture shows a broken stapler, unable to serve any useful purpose. This represents the broken trucks that litter the vehicle depot in Kumasi and are totally unserviceable.

### 5.4.5 Paradigms and challenges (See Section 5.1.3 for a brief explanation of this step.)

Paradigms proposed by case study group to describe the design of the existing project	Challenges and revisions proposed by another group
Privatised government services lead to better results. All services must be paid for.	Government services can also be run efficiently. Only satisfactory services should be paid for.

(table continues)

(Paradigms and challenges, continued)

Paradigms proposed by case study group to describe the design of the existing project.	Challenges and revisions proposed by another group.
User pays and will check the performance of collection systems.	Users should manage their own systems.
Least cost solutions (should always be selected).	Sustainable solutions are not always the cheapest.
The community needs external support and guidance.	The community should fight for self-sustainability.
The community's own resources (human, financial etc) are not adequate.	Community resources are priority.
Somebody should take care of our waste.	Take care of your waste yourself.
The system will not work without subsidies.	Stopping subsidies does not guarantee the willingness to pay.
Willingness to pay will increase.	Viable systems always work without subsidies.
All garbage is useless.	All garbage has a value.
Donkey drivers take care of their donkeys.	Some garbage should be re-utilised.
A clean city is healthier. We want to have a clean city.	Donkeys do not love their drivers.
From pilot studies to full-scale projects	Too much cleanliness can endanger biodiversity.  All projects are pilot projects. Pilot projects can lead to failure.

#### 5.4.6 Output of Subgroups

(See Section 5.1.4 for a brief explanation of this step.)

##### Subgroup A

###### Paradigm      Garbage has a value and is re-utilised

<b>Implications</b> (Practical consequences)	<ul style="list-style-type: none"> <li>• Income generation</li> <li>• employment</li> <li>• reduction in waste requiring disposal</li> <li>• positive effect on environment</li> <li>• hygienic conditions improved</li> </ul>	<ul style="list-style-type: none"> <li>• resource conservation</li> <li>• local material cycles</li> <li>• group creation (associations)</li> <li>• increased food production</li> </ul>
<b>Next steps</b>	<ul style="list-style-type: none"> <li>❖ Assess market opportunities and affordability</li> <li>❖ Investigate health aspects</li> <li>❖ Develop marketing strategies (promote urban agriculture)</li> <li>❖ Set up household level separation of garbage.</li> <li>❖ Set up separate collection or purchasing systems for the different streams</li> <li>❖ Set up composting and marketing operations</li> </ul>	

**Subgroup B****Paradigm Demand-responsive services are sustained by cost recovery without subsidies**

<b>Implications</b> (Practical consequences)	<ul style="list-style-type: none"> <li>• Communities select type and level of service that they pay for.</li> <li>• No more external aid for collection vehicles</li> </ul>	<ul style="list-style-type: none"> <li>• No further subsidies from Government, so less expenses for Local Government</li> <li>• Increased costs for secondary collection</li> </ul>
<b>Next steps</b>	<ul style="list-style-type: none"> <li>❖ Information campaign integrated in a comprehensive approach</li> <li>❖ Re-design and re-tendering</li> <li>❖ Improve performance monitoring – train Local Government staff.</li> <li>❖ Create favourable import conditions for waste collection vehicles and spares.</li> <li>❖ Adjust tariffs.</li> </ul>	

**Subgroup C****Paradigm Strong public institutions are essential in solid waste management**

<b>Implications</b> (Practical consequences)	<ul style="list-style-type: none"> <li>• Need for improved franchise management</li> <li>• Need for improved legislation and enforcement</li> </ul>	<ul style="list-style-type: none"> <li>• Clear definition of roles and responsibilities</li> <li>• Need for good performance monitoring</li> </ul>
<b>Next steps</b>	<ul style="list-style-type: none"> <li>❖ Consultation and workshop to define roles and responsibilities</li> <li>❖ Learn from experience elsewhere.</li> <li>❖ Develop documents in participative way.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Review staff capacity.</li> <li>❖ Define organisations chart and scheduling.</li> <li>❖ Review legislation.</li> <li>❖ Provide training in contractual processes and basic project management skills.</li> </ul>

## 5.5 Maintaining rural water supplies in Lesotho

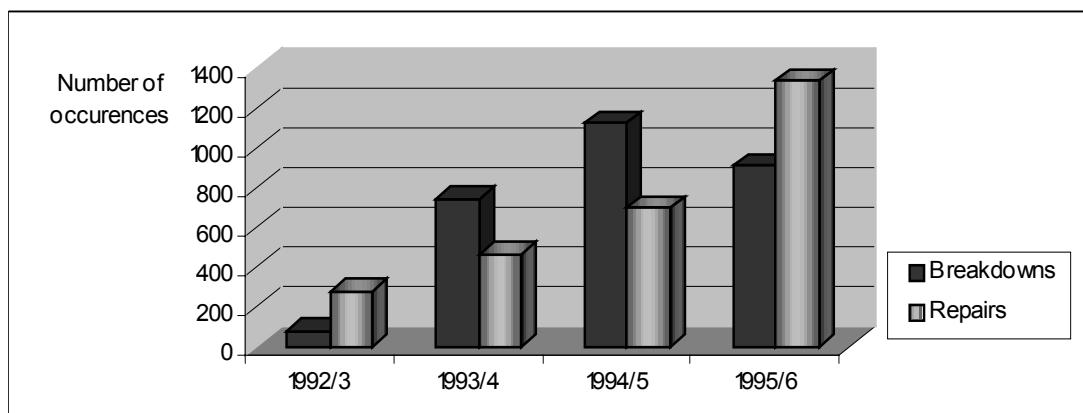
by Makhotso Lemphane

### 5.5.1 Background information

During the thirty year since the Department of Rural Water Supply (DRWS) was set up to provide safe water to Lesotho's villages, a number of paradigms have been followed and proposed in the quest to ensure that the water supply systems are kept in good working order. By the late 1980s water production actually went into decline, as more and more breakdowns were not repaired, as illustrated in Figure 5.3. At one stage a study by an independent consultant showed that 30% of the systems were not functioning. In response to this situation the following paradigms were proposed:

- ◆ Operation and maintenance should be considered at the stage of the feasibility study.
- ◆ Maintenance is the responsibility of the communities that use the supplies.
- ◆ Maintenance should be decentralised and privatised.
- ◆ More efforts should be devoted to preventive maintenance.
- ◆ Repairs should be made by an area minder if a local minder cannot do them.
- ◆ Inspection should be paid for by the Government.

More details about these approaches and the experiences in Lesotho can be found in Annex 5.4.

**Figure 5.3 Maintenance performance 1992 - 6**

Three important questions arise from this experience:

1. Is this a feasible and realistic approach?
2. How do we give a chance to DRWS mechanics to get into business??
3. What are the next steps – a workshop with the private sector, DRWS maintenance staff and District Managers?

### **5.5.2 Wearing another hat – the perspective from second choices for careers**

(See section 5.1.1 for an introduction to the steps in Sections 5.5.2, 5.5.3 and 5.5.4.)

Profession	Opinion
Sociologist	The responsibility for O&M should rest with the people.
Esoteric	The private contractor model can work if people pay.
Film maker	Different groups in the village should use their artistic abilities
Sociologist	Social mobilisation can create a sense of ownership.
Esoteric	Use a bottom-up approach.
Architect	Services should be improved.
Sociologist	Community structures need capacity building.
Lawyer	Village water committees should be formalised by giving them a legal status.
Architect	Consider the need for transport.
Economist	A fund for O&M should be set up with no subsidies.

### **5.5.3 Figure / ground reversals**

The foreground or figure in the presentation has been: (i) the private sector, (ii) the government and (iii) the role of the community.

Issues kept in the background have been: (i) Formalising the roles of caretakers, (ii) gender issues and (iii) political structures.

It was suggested that the following issues may have been kept too much in the background : cultural appropriateness; cost recovery; a grass-roots approach; the institutional structure; community ownership; the use of affordable and appropriate technology; transparency; payment for water services; the roles of different stakeholders; effective delivery of services.

### **5.5.4 Comparisons to a stapler**

As a stapler binds sheets of paper together, the chosen approach must bind the community, private sector and government together. There are many links between these three parties; for example the community must take full responsibility for O&M together with the private sector – the community must be able to deal with the private sector.

### 5.5.5 Paradigms and challenges (See Section 5.1.3 for a brief explanation of this step.)

Paradigms proposed by case study group to describe the design of the existing project	Challenges and revisions proposed by another group
<p>Water for all.</p> <p>Simple technology.</p> <p>Water services must be paid for.</p> <p>Household has to pay for water services.</p> <p>Privatisation of O&amp;M.</p> <p>Monitoring and evaluation happens at all levels.</p> <p>Operation and maintenance of water supplies is an obligation.</p> <p>Government plays a regulatory role.</p> <p>O&amp;M managed by the community is better than O&amp;M managed by government.</p> <p>Grass-roots approach.</p> <p>Community ownership.</p> <p>Active community involvement &amp; participation.</p>	<p>Affordable and appropriate use of technology.</p> <p>The private sector is a parasite.</p> <p>Community gives mandate for O&amp;M to private company.</p> <p>Keep away from the private sector.</p> <p>No monitoring, no evaluation.</p> <p>Need-responsive monitoring and evaluation.</p> <p>Continuous assessment of functionality of system.</p> <p>O&amp;M is optional.</p> <p>O&amp;M on a voluntary basis.</p> <p>O&amp;M only when supported by users.</p> <p>Shared responsibilities between government and civil society.</p> <p>O&amp;M is the user's responsibility.</p> <p>The Household-centred Approach.</p>

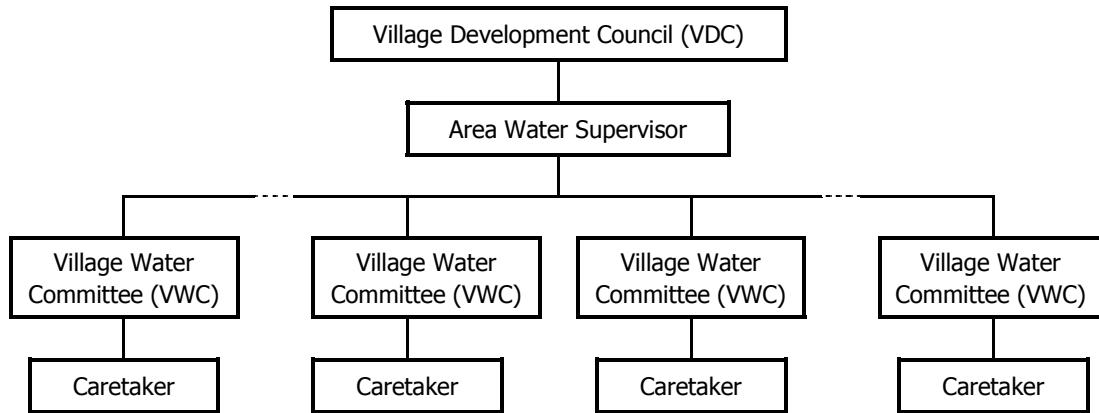
### 5.5.6 Output of Subgroups (See Section 5.1.4 for a brief explanation of this step.)

#### Subgroup A

##### Paradigm – The private sector is a good option for operation and maintenance

Implications	Next steps
Legal implications	<ul style="list-style-type: none"> <li>Provide provision to accommodate new legal requirements.</li> <li>Advocacy for changes in legislation.</li> <li>Enactment and enforcement of law.</li> </ul>
Undermining users' interests.	<ul style="list-style-type: none"> <li>Signing agreement between VDC* and the contractor.</li> </ul>
Dilution of sense of ownership.	<ul style="list-style-type: none"> <li>Entrusting the responsibility for supervision and monitoring of the private sector to the VWC*.</li> <li>Recommendation of the VWC* to be a precondition for renewal of contracts.</li> </ul>
Potential increase of water charges.	<ul style="list-style-type: none"> <li>Conditions stipulating service level and tariff to be included in the agreement.</li> <li>Tariff revisions to be approved by VWC/VDC*.</li> <li>Rules for tariff revisions to be defined.</li> </ul>
Excessive burden on poorest segments.	<ul style="list-style-type: none"> <li>Ensure concessionary rates for minimum lifeline requirement of water.</li> </ul>
Lack of interest by the private sector.	<ul style="list-style-type: none"> <li>Provision of an economic scale of operation.</li> <li>Create a conducive environment for private sector participation.</li> <li>Provide rewards or incentives.</li> </ul>
Limited experience of private sector in water supply.	<ul style="list-style-type: none"> <li>Capacity building.</li> <li>Training.</li> </ul>

\* VDC is Village Development Council, VWC is Village Water Committee (See also Figure 5.4)



**Figure 5.4 Local organisation of water supplies**

### Subgroup B

#### **Paradigm – Roles and responsibilities must be clearly defined.**

A clear definition of the roles and responsibilities of all stakeholders is important for effective service delivery. (Stakeholders include the Government, the private sector, and the local communities, including VDC and VWC.)

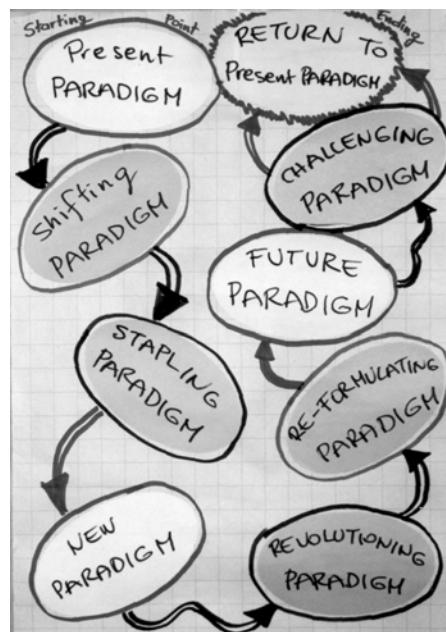
Implications	Next steps
Clearly defined roles and responsibilities, powers and authority.	<ul style="list-style-type: none"> <li>Identify tasks and responsibilities           <ul style="list-style-type: none"> <li>set up technical requirements</li> <li>establish administrative systems.</li> </ul> </li> <li>Establish regulations and byelaws.</li> <li>Prepare terms of reference and contracts.</li> </ul>
Clearly defined channels of communication, transparency and accountability.	<ul style="list-style-type: none"> <li>Set up organisational chart.</li> <li>Set up communication structures.</li> <li>Set up accountability systems.</li> </ul>
Commitment to perform	<ul style="list-style-type: none"> <li>Information campaign</li> <li>Making information accessible</li> <li>Creating better working conditions</li> <li>Setting up incentives (e.g. discounts).</li> </ul>
Providing resources	<ul style="list-style-type: none"> <li>Staffing           <ul style="list-style-type: none"> <li>recruitment</li> <li>job descriptions</li> </ul> </li> <li>Funding           <ul style="list-style-type: none"> <li>defining funding sources and flows</li> <li>accountability processes</li> </ul> </li> <li>Capacity building           <ul style="list-style-type: none"> <li>identify training needs</li> <li>develop training programme</li> <li>secure funding</li> <li>offer training as planned</li> <li>follow-up support and evaluation</li> </ul> </li> </ul>

**Subgroup C****Paradigm – Community takes full responsibility for operation and maintenance**

<b>Implications for . . .</b>	<b>Next steps</b>
Ownership	<ul style="list-style-type: none"> <li>• Information</li> <li>• Village mobilisation</li> <li>• Requests for new schemes to come from the villagers</li> <li>• Village assembly made responsible</li> </ul>
Village Water Committee (VWC)	<ul style="list-style-type: none"> <li>• Constituted by Village Development Council</li> <li>• VWC to be officially institutionalised, accountable to village assembly</li> <li>• VWC appoints a caretaker or can contract private company for maintenance.</li> <li>• VWC collects and manages funds for O&amp;M.</li> <li>• VWC is responsible for O&amp;M of its own schemes.</li> </ul>
Caretaker	<ul style="list-style-type: none"> <li>• receives remuneration for services rendered.</li> <li>• responsible for regular maintenance.</li> <li>• reports to the VWC.</li> </ul>
Area Water Supervisor (AWS)	<ul style="list-style-type: none"> <li>• Appointed by and accountable to VDC.</li> <li>• supervises O&amp;M systems.</li> <li>• recommends new schemes and controls construction.</li> <li>• supervises all financial aspects of O&amp;M and construction.</li> <li>• advises all VWC in his area.</li> <li>• organises capacity building at village level.</li> <li>• responsible for monitoring and evaluation.</li> </ul>
Village Development Council (VDC)	<ul style="list-style-type: none"> <li>• legalises the VWC.</li> <li>• ensures availability of funds.</li> <li>• appoints Area Water Supervisor.</li> <li>• contracts private company for major repairs and new construction.</li> <li>• co-ordinates all activities.</li> </ul>
Government	<ul style="list-style-type: none"> <li>• ensures provision of funds.</li> <li>• provides technical assistance and training.</li> <li>• ensures enforcement of law.</li> <li>• rewards good performance.</li> </ul>

**5.6 Postscript**

The review group of Friday morning proposed the following summary:



## Chapter 6     Conclusions and reflections

### 6.1     Concluding comments from Elisabeth Stern, the Resource Person

- ◆ We now know that context shapes the content, so we should be more aware of the importance of understanding the context.
- ◆ When going back to our projects, especially in cases where they are not moving as we would like them to, we can try to understand what is the "hidden" paradigm that acts as an unconscious driving force. Are there different conflicting paradigms, each person in the project having a different "unspoken" one?
- ◆ Different paradigms lead to different plans. Some have discovered for themselves that if we devote time to establishing and distinguishing the paradigm, the plan and actions will follow much more easily and naturally.
- ◆ The mindset around us can suck us right back into the old mode of thinking. We need to be committed to what we have discovered, without being unnecessarily stubborn. The pattern of life involves expansion and contraction – sometimes we are down because nobody seems to understand our new discoveries. When we are deflated we should not lose our motivation.
- ◆ Do not be surprised or discouraged if you make mistakes when applying paradigm thinking to your projects. We are practising. We form the path by walking on it.
- ◆ We should each try to find at least one other like-minded person to provide support. Stay in contact with at least one other participant.
- ◆ And, if you think that you are too small to change anything or to have any effect, you have obviously never been in bed with a mosquito!

The level of discussion at the workshop has been encouraging. It is very unlikely that there would have been this level of discussion 15 years ago, when the Aguasan workshops were just starting. But now, the participants have developed a trust in Aguasan and opened up quickly to the personally challenging topic. She was surprised how well the figure / ground reversal worked in the large groups. She expressed great appreciation for the preparation team; they deserve credit for the success of the workshop.

### 6.2     Conclusions of the editor

The workshop consisted of a variety of components – teamwork activities, instruction, discussion, group work and a site visit, all carefully structured around a theme, and all contributing to a growing understanding of why we need to think about how we think, and how we can move into new fields of thought.

The workshop presented each participant with many challenges. For many of us the first challenge was to understand and absorb the preparation paper that was circulated beforehand. In a completely different way we were challenged to reflect on our personal view of the world. We were then challenged to leave old familiar paths of thinking and to use the tools that we had been given to move out of the ordinary. We are left with a challenge as we return to our places of work.

Most new ideas and shifts in paradigms will not come automatically, without effort. Unless we take the trouble to shake ourselves free of unnecessary assumptions, to look for another perspective and listen to others, to look for the background or context, we will probably continue to think and move in basically the same direction. We have been given tools, but tools achieve nothing unless they are picked up and used.

It is useful to take time to consider paradigms, mindsets, approaches. It is *more* useful to take time to discuss them with others, particularly if the group is mixed (i.e. participants come from different backgrounds - educationally, culturally, professionally, and in terms of nationalities or roles). It is *most* useful to discuss paradigms in a mixed group using tools to structure and guide the discussion.

It is worthwhile to write down and agree on the precise formulations of paradigms that are in current use, rather than just discussing them in vague, general terms. Because the paradigm dictates or moulds the solution (mostly unconsciously), it is important to be fully aware of the paradigm in the background.

Perhaps we tend to move too quickly to the stage of working out the details, the next steps, the plan of action. We often need to take the time to reflect on the basic paradigm that, perhaps unconsciously, has set the direction of our thoughts. This was the experience with the group work, in which considerable time was spent applying different tools and approaches to develop innovative paradigms, but once these paradigms were established, the detailed implementation programme could be proposed relatively quickly. The most creative aspect of the group work was in the challenging and formulating of paradigms, rather than the listing the implications that followed from them. Some of the challenges to the paradigms do not seem serious or realistic, but such flights of fancy can result in escaping from unnecessary assumptions, discovering new perspectives and landing on fresh ground.

In our project planning, we need to schedule our sessions to ensure that there is time to discuss, develop, disagree on, and finally agree on paradigms. The agendas of our planning workshops should force us to first go back to the basic issues, so that we do not immediately rush to the details in order to complete our planning matrices. We need to find ways to incorporate mechanisms for reflecting on and challenging paradigms and assumptions. Reflecting on paradigms and assumptions in this way would help donors and partners to understand each other better, and to avoid conflict and tension at a later stage when differences in paradigms and objectives start to become concrete.

Over the last decade, progress has been made in improving the operation and maintenance of water supply and sanitation schemes, but the situation is not yet satisfactory. Too many people are still without access to a reasonably convenient source of wholesome water, and suffer from the lack of decent and hygienic sanitation. If the process of implementing improvements in water supply and sanitation is compared to a journey, we need to ask ourselves if it is enough simply to make small modifications to the route or timing, or whether we need to head for a different destination, or use a different means of transport.

Even if we are convinced of the need for major change in paradigms, the magnitude of the task of trying to change the paradigms of agencies, senior managers or governments may make it seem impossible. We can draw strength from the lessons of history, that changes have occurred and that they are now occurring at an increasing pace, and we can use the increasing opportunities for networking to work towards that figure of 20% support that seems to be enough to start the shift of the paradigm.

## Annexes

Numbers at the foot of the pages in the annexes begin with an "A"

Annex 1- Preparation for the Workshop .....	1
Annex 2 – Suggestions for further reading .....	6
Annex 3 – Exercises with Eurotrek.....	7
Annex 4 – The field trip.....	11
A4.1    Introduction.....	11
A4.2    Background .....	11
A4.3    Programme of the visit.....	12
Map of Geuensee showing drainage features and route taken on field visit.....	14
A4.4    Further information .....	15
A4.5    Discussion .....	16
Annex 5 – Background information about the case studies .....	18
A5.1    Social processes and drinking water supplies – a case study from Cameroon .....	18
A5.2    Operation, Maintenance and Sustainability of Urban Services in Faisalabad, Pakistan.....	20
A5.2.1 <i>History of CAP</i> .....	20
A5.2.2 <i>CAP today</i> .....	20
A5.2.3 <i>The context</i> .....	20
A5.2.4 <i>The study</i> .....	20
A5.2.5 <i>Lessons learned</i> .....	21
A5.3    Franchise Management of Solid Waste Services in Ghana.....	22
A5.4    Maintaining rural water supplies in Lesotho.....	23
A5.4.1 <i>Background to the current situation</i> .....	23
A5.4.2 <i>Alternative 1 – the Area Minder system</i> .....	24
A5.4.3 <i>Alternative 2 - Communities contracting directly</i> .....	24
A5.4.4 <i>Stakeholders</i> .....	25
Annex 6 – Some insights, lessons and action plans .....	26
A6.1    Insights and lessons learned .....	26
A6.2    Action plans - tasks on returning.....	29
A6.3    Comment from a case study presenter .....	29
Annex 7     Global partners in water supply and sanitation.....	31
Annex 8 – Summaries of evening presentations.....	33
A8.1    Household level solar disinfection of drinking water .....	33
A8.2    Innovative video on water supply from Mozambique.....	33
A8.3    Web site for healthcare waste management .....	33
A8.4    Rainwater harvesting .....	34
Annex 9 – List of participants.....	35
Annex 10 – Review of comments in evaluation questionnaires .....	38
Annex 11 – Solutions and contributions .....	39
Annex 12 – The topics of past Aguasan Workshops .....	41
Annex 13 – Topics suggested for the next Aguasan Workshop.....	42
Annex 14 – Some definitions and abbreviations .....	43

## Annex 1- Preparation for the Workshop

The following notes were circulated to participants before the start of the Workshop in order to help them prepare for the meeting.

### Sensitivity to the role of paradigms in our perception can be an important tool in problem solving!

*Extract put together by Elisabeth Stern, resource person for the Aguasan Workshop 2001, from writings and lectures/workshops by James Ogilvy and Peter Schwartz, a philosopher and an engineer, both highly acclaimed futurists.*

This is to be read by all participants in advance of the Aguasan Workshop. It serves as context and framework in which the workshop is meant to unfold.

The world is round: a true description of reality, but once such a statement would have been false, foolish, and heretical. Our beliefs about what is true and real undergo fundamental shifts from time to time. And when our perception of the nature of things shifts, the complex system of human life also shifts.

Copernicus and Galileo took the motion of celestial bodies out of the realm of the gods and brought it over to the impersonal forces of nature - nature that could be understood by man. So began an era in which man, the individual, was ascendant. We created a politics where individual choice was at issue, not the will of competing gods or divinely endowed kings. We created a technology applying the comprehensible and predictable forces of nature. We created an economic system in which individual effort could lead to making real progress rather than being perpetually locked in a divinely rationalized economic order.

When there are major shifts in the fundamental pattern of knowledge and belief, the whole of the human condition will also change. Such shifts occur very infrequently, the last (in the West) being the Enlightenment in the seventeenth and eighteenth centuries. We believe that another such shift is now in progress, signalling a major change in human values and beliefs. The indications of such a shift are found in changes occurring in the shared pattern of ideas over a broad range of human inquiry, thought, and interest.

#### A paradigm in the broader sense is the lens through which we see everything.

A civilization's fundamental view of the nature of things has been called *world view*, *Zeitgeist*, *episteme*, and *cultural paradigm*. As a convention we will adopt the term paradigm. Paradigm is used in two senses:

- ◆ An example we use to teach basic concepts, which has a metaphorical nature, e.g. the father as the paradigm for authority.
- ◆ The whole pattern of such metaphors, which leads to the internalization of a "map" of reality or a belief system.

The formal disciplines create **models and metaphors** for the way things are. These **move out of the formal discipline to shape our common understandings** and often back again to be applied in a new discipline. For instance, the physicist invents the hologram, the concept of which

becomes a part of the vernacular. The brain theorist comes to understand the concept and sees in the hologram a metaphor for the complex system of brain functions, leading to new avenues of research etc.

**Together these models and metaphors form a kind of atlas of mental maps of the actual world. They tell us what we know about the nature of things - what is real, what may be false, and what to pay attention to. To some extent the maps are taught in school in history, science, literature, etc. To some extent they are embedded in our language. To a great extent they have become a part of our cultural and social systems. We are rarely conscious of them because they are usually implicit: paradigms tend to surface mainly when they are changing.**

But formalized knowledge is almost inevitably incomplete, i.e. the physicist describes molecules, but not living beings. For the purposes of each discipline, this incomplete description is usually adequate. Where it is not, a new discipline arises, e.g. biophysics. In contrast, the ordinary and common paradigm is in a sense complete. There are mysterious areas, to be sure, but

**we behave as if our mental maps were complete,**

as if reality were a seamless whole. Yet we know that there are gaps where our ordinary experiences simply do not fit the more formal abstractions. This dissonance between human experience and abstraction is an important motivator of study in the formal disciplines.

In historical terms, until the seventeenth century the Aristotelian model of organic growth provided for Western civilization an internally consistent world view or paradigm. It finally began to crumble under the onslaught of new ideas, beginning with the publication by Copernicus in 1640. Newton, Bacon, Descartes, Leibnitz, Voltaire and others carried on into what became known as the Enlightenment, or the Age of Reason - all signifying the triumph of the human intellect over the natural order.

To be sure, the development of the Enlightenment was far from a smoothly ordered process. It is doubtful, for example, whether Newton would have accepted what quickly came to be known as the Newtonian world view. But there was a broad pattern of change across the natural sciences and the humanities that radically altered the existing common understanding of the nature of things. **The most familiar example is the change from considering the earth as the center of the universe to seeing it as one celestial body among many. Ultimately, those new understandings were reflected in the human, social, psychological, religious, political, and economic orders. That era shattered and reformulated Western civilization's shared pattern of beliefs.**

Among the greatest of the changes is the capacity to make just this kind of leap: from a series of thoughts about phenomena on one level to an entirely different level of thought *about those thoughts* on the first level. Not just more and different thoughts on the first level, but a meat-leap to meta-laws covering the laws on the first order of generality: **thinking about thinking and knowing.**

So, for example, organic change - growth - was the paradigm or pattern for change for an entire epoch of science. Aristotle is the chief ideologue of that epoch. Non-organic, mechanical change became the dominant pattern for change during the centuries following Galileo and Newton. In place of the acorn becoming an oak, clocks and pendulums were taken as models for the orderliness of the

cosmos. Now the pattern is changing once again. Neither the teleological interpretation of organic growth nor the causal account of physical mechanism is adequate any longer. And we know it.

Further, we know that we know it. We know that we have accomplished a break from our previous paradigms. We know that there are such things as paradigms. Before our era, **most people didn't think of themselves as caught within a paradigm**. Having never consciously experienced a shift of paradigms, the very existence of paradigms could not be perceived. Now, however, not only do we appear to be on the edge of a new paradigm, but in addition, we know that there are paradigms. **Precisely that awareness is part of the new paradigm, that meta-leap to a self-reflective stance on all of one's thoughts, and how it is , finally, that thought thinks about itself.**

**A paradigm is, broadly construed, the set of those beliefs, axioms, assumptions, givens, or fundamentals that order and provide coherence to our picture of what is and how it works. These beliefs are like our map of reality. They are not the reality itself, but the directions we use to find our way across the terrain.**

During the past decade the term *paradigm* has been bandied about in a number of disciplines. When used in the phrase *paradigm shift*, it often carries a reference to Thomas Kuhn's influential book *The Structure of Scientific Revolutions* (1962). Kuhn revolutionized our common understanding of scientific progress by pointing out an **important distinction between what he called**

- ◆ *normal science*, which grows by gradual additions to our fund of knowledge
- ◆ and *revolutionary science*, marked by discontinuous breakthroughs that seem to demand a whole new perspective on the data, or a new map of data.
- ◆ Normal science depends on the shared acceptance of a given paradigm,
- ◆ revolutionary science requires a shift of paradigms.

Kuhn's use of paradigm means on one hand a set of procedures that every member of the scientific community learns to accept as definitive of scientific method. On the other hand, **paradigm has a much broader use associated with one's entire belief system or map of reality: the lenses, as it were, through which one sees everything**. Thus, **a paradigm shift may mean either an alteration in the set of exemplary experiments defining the education of a scientist, or it may mean an alteration in the shared consciousness of a culture - or both**. Clearly, the two meanings are not unrelated, for a given set of exemplary experiments contributes to our general sense and understanding of the orderliness of the universe. And, **depending on our general belief system, we may accept the lever or the voodoo doll as the proper experimental mechanism for understanding causal efficacy**.

Though Kuhn has given remarkable currency to the concept of a paradigm, the basic insights have been around since the German philosopher Immanuel Kant. Kuhn's essay came as a surprise to the Anglo-American tradition only because the paradigm of discontinuous paradigm shifts was part of a European tradition, that, though two centuries old, was largely unfamiliar to English-speaking scientists. To put the point as paradoxically as paradigm shifts sometimes demand, **a paradigm shift was necessary before the concept of a paradigm could be understood**. The paradox is created by the fact that the old Anglo-American paradigm of empiricism amounts to the view that there are no such things as paradigms, the only things of interest are "the facts". The empiricist has a tacit theory of consciousness: that mind is a mirror of the world and knowledge is an undistorted representation or picturing of things as they really are. Recent advances in a number of different disciplines, however, have presented anomalies or **problems** apparently **insoluble within the old paradigm**. With the passing of the empiricist paradigm of the mind as a passive medium, more and

more scientists have begun to take seriously what some continental philosophers have known all along: namely, **how we see things determines much of what we see.**

Kant was the first to argue **the importance of our subjective modes of seeing** and understanding our experience. Where previous philosophers had seen the mind as a blank tablet receiving impressions from the outside world, Kant described consciousness as an active ordering of otherwise chaotic impressions. The order we experience is not "the order of the world" passively received as through a transparent pane of glass, instead, **the order we experience is very much a function of the mind. To the extent that we experience the same order from our individual perspectives, we are inclined to think of that order as the world's order.** According to Kant, however, **we experience the same order because all rational creatures order experience using the same intrinsic categories - i.e., according to a shared paradigm.**

**A given paradigm molds the thoughts, perceptions, and opinions of those who share it.**

Early in the twentieth century, thinkers from several disciplines spawned a new area of inquiry now known as the sociology of knowledge. Why do some ideas take hold or some fail independent of whether they are judged to be right? In this approach ideas are studied not in terms of their rightness, but in terms of their influence - the study of the behavioral cues we give that instruct others on which paradigm is appropriate for interpreting our actions, or to an awareness of subtleties that communicate mind sets such as "this is a joke", "this is serious". Just as "once upon a time" puts us into a fictional frame, so a dog's baring of fangs may mark a shift of frame from play to fight. We accomplish these mini-paradigm shifts so unconsciously that we become aware of them only when they are missed by someone, as in madness or humor - or when we move to live in a different culture.

**Sensitivity to the role of paradigms in our perception can be an important tool in problem solving.**

Once we know that all our problems cannot be solved within the frame of a current paradigm, then it is sometimes possible to solve a problem by reframing its terms. One thinks of the (French) sergeant who was ordered by his commanding officer to clear the rabble from a crowded square, and to shoot if necessary. His problem: apparently either shoot "the rabble" or disobey orders. He solved this apparently insoluble dilemma by reframing the terms of the problem. "Mesdames et Messieurs", he addressed the crowd, "I have been instructed to fire upon the rabble, but since I see many law-abiding citizens in front of me, I would ask that you leave the square so that my men can fire upon the rabble without injuring any innocent bystanders."

Other terms that have been used for the general concept of a paradigm include, as noted earlier, Zeitgeist, world-view, pattern of culture, and epistemes. This last concept is especially interesting. Michel Foucault, a contemporary French philosopher of history, coined the term to mean epistemic domains. In this case, the term refers mainly to the structures embedded in the language within which a discipline is expressed. **Language, according to Foucault, is not neutral. It is a mirror of the contemporary consciousness and so conditions, links, and shapes the study of human affairs.**

Whether it is called a paradigm or a world view or something else, there is a widely held conviction that behind the seeming chaos and conflict in intellectual life there is a pattern, even if temporary.

Although understanding of it evolves and shifts with time, that pattern, like a map, is central to understanding how changes take place in a society, especially when there are rapid and deep changes in progress. As our interests change and our abilities to map increase, the nature of our maps changes, becoming richer and more complex. Instead of the solid earth beneath our feet, we find floating plates colliding with earth-rending and mountain-building force!

Can we talk about paradigm shifts without facing certain implications? Some talk, for instance, as if it were only a question of a new *method* for approaching closer to the truth. It is as if Kuhn's distinction between normal science and revolutionary science - between the continuous and the discontinuous - were a merely methodological distinction. But the implications of Kuhn's thesis are much more radical. The point is not only that we make breakthroughs in the representation of reality, but that there are fundamental alterations in what counts as reality.

**We can no longer think of reality as something that remains what it is, no matter what people think about it. A rose by any other name is still a rose, but an atom by another name may not be what people used to think they were naming by atom. We can no longer think of reality as utterly independent of human cognition.**

Certainly, the common sense usage of reality retains its sense. Thinking something or stating an opinion does not necessarily make it so. We check our opinions against reality. But the publicly shared reality we use to check our private opinions is not unchanging as we once thought. Instead, the shared paradigms for what counts as reality shift from time to time. Parts of an old reality take on new roles as our perception of reality itself alters. Think of the history of the sun: from direct object of worship in sun cults to a slightly less central role in the colorful narratives of Greek mythology; from the chief body in heavens that revolve about the earth to the center of a solar system in which the earth is but one of several satellites. And finally the sun becomes the focus of hopes as a possible source of energy. These changes accompany epochal shifts according to which the ultimate horizon of human experience is first religiously, then scientifically or astronomically, and finally ecologically.

\*\*\*\*\*

#### **Please reflect on paradigms and paradigm shifts**

- ◆ in your culture as a whole
- ◆ in your individual life
- ◆ in your studied discipline and present work situation
- ◆ and on what you think could represent a paradigm shift in the water sector and in your present water project

Remember: Sensitivity to the role of paradigms in YOUR perception can be an important tool in problem solving.

Dr. Elisabeth Stern

[estern@bluewin.ch](mailto:estern@bluewin.ch)

April 20, 2001

## Annex 2 – Suggestions for further reading

Phil Hawken, Amory Lovins and L. Hunter Lovins; *Natural Capitalism – creating the next industrial revolution*; Little, Brown and Company, Boston, 1999 ISBN 0-316-35316-7 (see especially the photocopies handed out at the workshop: Chapter 11 *Aqueous Solutions*, and pages pp288-308 about innovative problem-solving in the city of Curitiba (population two million) in southern Brazil).

Prigogine, Ilya and Isabelle Stengers; *Order out of Chaos – man's new dialogue with nature*; Bantam Books, Toronto, 1984, ISBN 0-553-34082-4 (see especially the photocopies of the Foreword by Alvin Toffler, handed out at the workshop).

Ray, Michael and Alan Rinzler (editors); *The New paradigm in Business – emerging strategies for leadership and organizational change*; G. P. Putnam's Sons, New York 1993, ISBN 0-87477-726-7 (see especially the photocopies of Chapter 24, *A systems Approach to the Emerging Paradigm* by Fritjof Capra, handed out at the workshop).

### Annex 3 – Exercises with Eurotrek

As mentioned in Section 2.2, the Workshop started with some outdoor group activities led by the outdoor training experts, Eurotrek of Zürich.

They were

- a) Explaining shapes: One half of each group was given a shape made of triangles, and the task was to pass then triangles one by one to the team formed by other group members, who were hidden from view, with an explanation of how each triangle should be orientated and located to produce an identical overall shape.



Which way does it go?

- b) The spider's web. A large spider's web had been slung between two trees, and the assignment was to pass all team members through openings in the web without touching the web (and attracting the attention of the ferocious "spider"). Each opening could be used only once.



Fortunately the ferocious spider is still asleep



Contact!

Desperate situations require  
desperate measures



- c) The route through the squares. A grid of squares was laid on the ground, and the unique route through the grid was to be found by a trial and error process. Anyone stepping in a wrong square was informed of the mistake with a bell, and was obliged to return to the start so that someone else could try to find the route. Finally all members of the group were to cross by the route.



Did she ring the bell?

- d) The bell tower. Using drinking straws, thin canes and scotch tape, a tower was to be constructed such that its overall height was exactly 1.5 metres and it was strong enough to support a heavy cowbell.



The secret is good preparation



1.5 metres exactly



The cowbell suspended – what suspense!

- e) Crossing the islands Using three sturdy planks to which ropes were attached, the entire team was to cross a series of "islands" without going into the "sea" (i.e. stepping on the grass). This was complicated by the fact that the distances between some of the islands were greater than the length of the bridges, so that it was necessary to lay the bridges in the form of a "T"



It all started off so well . . .

. . . it was a pity they got left behind.



Please don't take it personally. and . . . don't feed the crocodiles.

## Annex 4 – The field trip

### A4.1 Introduction

It might have been very difficult to find a site visit that illustrates a shift in paradigms, but in fact there was a very suitable location, not far away. We went to the small village of Geuensee where the chief of the village, Bruno Strelbel, has developed and implemented an approach to stormwater drainage that is revolutionary in modern Switzerland. The new paradigm was developed with one eye on costs and the other on performance, and the result is an example which should arouse considerable interest among other similar communities in Switzerland and elsewhere.

The conventional approach to the collection and disposal of rainwater had been implemented in part of the village. It comprises large combined sewers that collect both the heavily polluted sanitary wastewater from toilets, bathrooms and kitchens, and the much larger flows of lightly polluted surface water from rain and snow, and also some clean groundwater from the many natural seepages within the area. This groundwater has been allowed to flow into the system for merely practical reasons and in an old-fashioned trust in the benefits of natural flushing of the pipes. Some may also enter the system through small leaks in the joints. This type of system demands large pipes to carry the rainwater and large treatment works to clean the water, together with overflows that pass some of the polluted water to the lake when the combined flows are very large. The costs of this conventional system were high, not only at the collecting site but furthermore while being forced to expand capacities of treatment plants. An alternative was proposed. It comprises

- ◆ separate open surface drainage channels for rain water collection,
- ◆ retention ponds to reduce peak flows of stormwater,
- ◆ incentives to encourage property owners to allow rainwater to infiltrate into the soil rather than to run off to the drains,
- ◆ the discharge of this lightly polluted rainwater directly into the river Suhre after the water has been treated by natural processes in the channels.

The cost of separate systems (for sanitary sewage and stormwater) would have been 12 million CHF (Swiss Francs), equivalent to US\$ 7M, the cost of extending the combined system would have been about CHF 6M, whereas the solution that was followed cost only CHF 3M.

Experiences in Geuensee had shown how innovation attracts criticism, and also how media coverage helps innovation. By persistence and patience it had been possible to change the approach to solving drainage problems. Taking some ideas that seem old fashioned, and combining them with clear thinking, modern scientific knowledge, concern for the environment and a desire for value-for-money, and by building, adapting and experimenting, the benefits of a new paradigm had been demonstrated.

### A4.2 Background

The lakes of Switzerland became polluted in the 1960s, and so Federal legislation was enacted to require treatment of all household wastewater discharges into the lakes. This had been very successful, and now 98% of households are connected to wastewater treatment plants. However, some trace pollutants still reach the lakes and may result in low fertility among fish (or it may be that there are less nutrients because of the high quality of the wastewater). This huge undertaking had required many subsidies, and had resulted in close links between the contractors that were building the sewer systems and the local government clients who commissioned the construction. When the main thrust for treating wastewater was under way, the subsidies for these improvements were 1/3

from central Government and 1/3 from the Canton. Later the level of subsidy was greatly reduced, and this may have had a considerable impact on the decisions that were made subsequently.

The village of Geuensee has a population of 2000. Its wastewater flows to a central wastewater treatment plant that serves a total population of 60,000. This plant is financed on an independent basis by billing the communes and industries that discharge the wastewater. The charges for the communes are based solely on the volume of wastewater and not by its quality or nutrient load. (Industries are charged on the basis of quantity and quality.)

#### A4.3 Programme of the visit

On the way to Geuensee we stopped in the city of Luzern to look at the picturesque wooden bridge called the Kapellbrücke.



At Geuensee we were met by our Guide, the chief of the village of Geuensee, Mr Bruno Strebel (who has been a close supporter of Aguasan workshops for many years and who wrote the report for the 1997 Workshop). With him were the manager of the wastewater treatment plant and two people responsible for environmental issues in the Canton. First we were given a general introductory briefing, and then we went for a walk around the village, noting the different measures that had been taken, including

- ◆ open drains along the side of a street, in which spring water is continuously flowing (See photo) (There had been cases of cars falling into the open drain beside the road, so wooden planks were put in as a temporary measure to prevent car wheels from falling to the bottom of the drain. An employee of the village checks the cleanliness of the street drains each day and cleans them whenever necessary. In one small drain colonisation by vegetation had been encouraged to provide a pleasing appearance - (but the plants had been damaged by the highly motivated drain cleaner);
- ◆ ditches through fields – the ditches contained a variety of vegetation that treat the water and also encourage wildlife such as frogs;
- ◆ open ditches and surface drainage in a school, (The conventional inlets had been blocked, so that the area is no longer classed as impervious, thereby saving on drainage charges. This system had caused no problems in five years of operation. The flow was directed to a football field and a storage pond.)

- ◆ storage ponds for individual houses, and for a group of houses. (These reduce the peak flows in the drains during rainfall. If the flow of water is too high for the surface drains, the excess water can flow into the conventional combined system.)
- ◆ the supply of spring water that keeps water flowing in the street drain, and
- ◆ the cluster of houses where Mr Strelleb lives and where rainwater is used for watering plants, an ornamental pond and a swimming pool.

The map on the following pages shows the features and the route taken through the village.

After rest and refreshment in Mr Strelleb's house we gathered in the courtyard around the pizza oven for a discussion of what we had seen. Finally we were entertained to an excellent dinner in a new house nearby.



The open street drain, showing measures to prevent cars from entering it



A larger retention pond serving a group of houses

Photo: Urs Fröhlich



The retention pond  
for a single house  
— an attractive  
feature.

**Map of Geuensee showing drainage features and route taken on field visit.**

#### A4.4 Further information

##### *The process of persuasion*

Perseverance had been needed to introduce this change of thinking regarding stormwater management, and there had been several stages in the process to implement these new ideas.

- ◆ First a study was undertaken by university students, to understand the flows of different kinds of water. University staff from ETH in Zürich provided some technical guidance.
- ◆ Then the village council members were taken on a tour to the picturesque town of Freiburg in Germany to see the open drain system there, where the flowing water is an attraction, and there had not been any accidents caused by the drains.
- ◆ The planning of the innovations involved a group of about 30 villagers, who also talked about the new ideas to their friends and neighbours, thereby improving general awareness.
- ◆ Good links with the press were regarded as very important, because people believe what they read in the newspaper.
- ◆ Finally, at the annual village meeting, everyone supported the ideas for the new drainage system.

##### *Some technical points*

The village benefits from good slopes, so that open drains do not need to be deep or large.

The soil is relatively sandy, making it suitable for infiltration, but also causing high flows of infiltrated groundwater in deep conventional sewers. The groundwater has a high lime content, which caused blockages in pipes, but now may confer some benefit on the drains as it helps to seal and stabilise them.

The flow in the combined sewers is about 1/3 stormwater by volume (but this water is not flowing continuously, but only during rainfall, when high flows are attained), 1/3 sanitary sewage and 1/3 infiltration.

The runoff from roads is not clean, but the pollution levels from a small village are not high. Greater pollution can be caused by the slurry that is spread by farmers on their land, so farmers are not allowed to spread any slurry within 3 m of a water course.

##### *The impact of financial incentives*

Good community relations have been important. Property owners have been given the option of reducing their drainage bills by allowing rainwater to infiltrate into the ground or by building retention ponds. About 15% of the houses were modified in the first year (1999) to take advantage of the cost savings from the new approach to drainage. Plans for new buildings are checked to ensure that appropriate measures are installed to save drainage costs. Some residents have developed ingenious ways of reducing flows and using the stormwater.

The fee for connection to the sewer system is about 1.5% of the total cost of a house (CHF 5 for each square metre of plot area and per cubic metre of building volume). The annual fees are as follows:

CHF 0.9 per m<sup>3</sup> for water supply,

CHF 1.2 per m<sup>3</sup> (the same volume as for water supply) for sanitary wastewater, and

CHF 1.2 per m<sup>2</sup> of impervious area (roof, or concrete or asphalt sealing on the ground). If 15% or more of a surface is porous, the surface is classed as semi-permeable and the fee for this area is a half of what it would be for a fully impermeable surface.

Storage ponds for houses are required to have a capacity of 30 litres for every m<sup>2</sup> of sealed surface, and to be empty after 10 to 24 hours. Storage for rainwater reduces the drainage charge to less than 20%.

Example: In the cluster of 13 houses where Mr Strelbel lives, the drainage charge was previously based on an area of 2500m<sup>2</sup>. The innovations that they have implemented have reduced this area to only 250 m<sup>2</sup>, so that the drainage charge is now 10% of what it was before.

#### *Other points*

- ◆ About 20% of the village population really support the changes, 5% to 10% oppose, and the majority do not show much interest. Drainage is not an important political issue. However there is a strong feeling of ownership of the system.
- ◆ Women have been particularly supportive of environmental improvements.
- ◆ Contractors and engineers have been on both sides of the debate concerning these changes. The contractor who did most of the drainage work for the village actually supported the innovations, but another engineer was very inflexible.
- ◆ Operation and maintenance problems are solved as they arise.
- ◆ Environmental groups and parties of students have come to the village to see what has been achieved. There had also been a party of visitors from North Korea.

Clean, flowing water is something to be enjoyed, not a nuisance to be hidden in buried pipes.

#### **A4.5 Discussion**

The visit illustrated several changes in paradigms. It shows a move away from the desire to have the best – often understood as the most expensive – to a consideration of value for money and a concern to implement arrangements that are more in harmony with nature. There is a willingness to consider solutions from the past, which would previously have been regarded as old-fashioned and primitive, instead of regarding development as a one-way street or a ratchet. The stormwater management system shows a willingness to consider in a fresh way a wide range of factors and consequences instead of staying within a conventional mindset.



The experience with these innovations shows clearly that time is needed to introduce change. These changes took nine years. Often insufficient time is allowed in development co-operation projects. This project shows the need for persistence, and might not have happened if the village council had not been ready to take risks.

Previously the paradigm had been to maximise the use of arable land (resulting from the need to be self-sufficient in food during the last war). Therefore covered pipes were preferred to open ditches, which occupy land area. This mindset is now changing, as more value is attached to creating areas of natural wildlife habitat.

Another paradigm shift was illustrated by the swimming pool in the housing cluster next to where we were discussing. The water in the pool was clean in a sanitary sense, but not clear, and had no disinfecting chemicals in it. Some years ago and in other situations it would not be regarded as safe to swim in this water. Recently there has been more understanding about natural purification systems and natural ways of controlling mosquitoes, and it is now regarded as safe to swim in this water. (If a child has an infection, (s)he is not allowed to enter the water.) No child appears to have become ill as a result of swimming in the water. Often paradigm shifts result from economic pressure, but this one seems to have resulted from a greater understanding and a willingness to take a calculated risk, rather than from any financial pressure. This shift is perhaps particularly interesting

because it has occurred in Switzerland where great importance is attached to cleanliness and sterile conditions.

Elisabeth Stern, in a discussion of the visit the following day, mentioned that this case shows the impacts of changing policy from central government (particularly in the reducing subsidies) and the importance of economic pressure. A new paradigm, currently gaining acceptance, is that "small is smart". Previously the aim was "bigger and bigger". Before large size was an asset; now it is a risk. Large dams were seen as indicators of success; now they have many opponents. Before large cars were popular; now many people are concerned with efficiency and environmental impact.



⇒ Bruno Strelbel explaining a point



The pond and swimming pool ⇒

Photo: Urs Fröhlich



A pleasant location and an interesting discussion

## Annex 5 – Background information about the case studies

### A5.1 Social processes and drinking water supplies – a case study from Cameroon

by Numfor A. Esther;

*(These notes are taken from a paper prepared by Numfor Esther entitled "Social Processes and drinking water supplies, Cameroon".)*

#### **Social processes**

Social processes of drinking water can be defined as the non-technical aspects that influence the functioning and management of a water scheme. Examples are the users' capacity, skills development and degree of empowerment. Social processes lead to a change of mind and self-development. If these social processes are ignored, it will directly or indirectly influence the functioning of the scheme. Experience from the monitoring of 105 Helvetas water supply schemes has shown that social processes are important components to the functioning of a water project.

Two main methods used in social processes are:

- ◆ Animation, including contact visits, general meetings, mobilisation for manual work and training;
- ◆ Monitoring – assessment of conditions in the field is also an effective form of training.

#### **Government strategy**

Government support for implementation of water supplies is highly centralised, under the Ministry of Mines, Energy and Water Resources (MINMEE). Selection of priority villages is on the basis of expressed demand and a survey of local conditions. Maintenance should be taken care of by contributions from the villagers and training arranged by MINMEE, but these arrangements have not proved successful because of a lack of resources in the Ministry, the opposition of traditional leadership, the lack of sanctions to encourage payment of fees, highly diversified technologies, and the absence of a national legal policy. Steps are being taken to overcome these problems. Proposals for solving these problems include the incorporation of young entrepreneurs into the maintenance system, the involvement of municipalities and the development of an institutional framework.

#### **Helvetas in Cameroon**

Helvetas started to work in the water sector in Cameroon in 1964, initially working with Central Government, but later with NGOs, and now by contracting the private sector. The central Department of Community Development has been shown to lack capacity for efficient implementation of this work. A new resource for village management is retired people returning to their villages after working in urban areas.

#### **Sop village – a case study**

Sop is in the North West Province of Cameroon, located in hilly terrain where the main occupation is growing crops. The village installed its water supply in 1975/6 with the help of Helvetas, government funds and technicians from the Department of Community Development. Before the advent of this gravity-fed piped scheme, the villagers obtained their water from a polluted stream. The system initially supplied 20 communal taps, but now there are 45 communal taps and 70 private taps. Asbestos-cement pipes were used, and they are now so old that frequent repairs are needed. However, asbestos-cement pipes are no longer available, and so repairs must be made with plastic pipes, great difficulties being experienced in joining plastic pipes to the existing network. An important part of capacity development has been the regular monitoring of the entire system. In spite of the difficulties, the system continues to operate. Table A5.1 shows the section of a stakeholder analysis that is concerned with operation and maintenance.

## SOP VILLAGE, CAMEROON STAKEHOLDER ASSESSMENT FOR OPERATION AND MAINTENANCE

STAKEHOLDERS	STRENGTHS	WEAKNESSES	LIMITS	POTENTIALS
Community / traditional council	They have the ability to form committees, appoint caretakers, and institute levies.	<ul style="list-style-type: none"> <li>Communities are ignorant of their functions</li> <li>Some committees are inactive</li> <li>There are no rules and regulations that bind them</li> <li>Lack of authority</li> <li>Do not undertake maintenance</li> <li>No motivation for caretakers and committees</li> </ul>	Unwillingness to pay levies because of limited means, ignorance and poor documentation. Caretakers are not conscientious (low morale).	<p>The committee and community need continuous training and education</p> <ul style="list-style-type: none"> <li>Periodic technical services and financial assistance on major faults on existing projects</li> <li>Allocation of monthly compensation for caretakers and periodic motivation for committees</li> </ul>
Rural council	Support caretakers	It has no authority over the committee and no authority over the water project	Can only support and not control	If the project is realised through the rural councils they could have firm control.
Government	Have the authority, the means and can afford technical services	<ul style="list-style-type: none"> <li>No laid-down strategy / policies.</li> <li>Intervention of politics in development</li> </ul>	<ul style="list-style-type: none"> <li>Lack of a democratic culture in implementation of policies</li> <li>Lack of decentralisation</li> </ul>	Localisation by empowering rural councils to take up the supply of social amenities
CARD (NGO – Cameroon Association of Rural Development)	Staff with social knowledge work the with committees (monitoring) Done by female social workers which acts as a spur to the community	Tedious and time-consuming		Could function better if well funded with a project financing basis.
Helvetas / donors	Available means to pay for qualified intervening services. (Training, maintenance)	Cannot satisfy the increasing demand for rehabilitation works	Limited budget	Increase budget

### Four approaches to water supply provision in Cameroon

1. *Centralised Government approach* – The Ministry that has been assigned is unable to take care of all the needs of the rural areas. Communities that lobby most effectively get financial support.
2. *Co-operation approach* – communities apply for funds from Government and donors for studies and implementation. Problems include the lack of manpower
3. *Sub-contracting* – the new approach adopted by Helvetas, subcontracting all aspects (including training) to CARD, with supervision from Helvetas.
4. *Procurement approach* – tenders are launched and qualified contractors selected. CARD supervises their work. The tendering process causes delays and some contractors lack experience in the water sector.

## **A5.2 Operation, Maintenance and Sustainability of Urban Services in Faisalabad, Pakistan**

by Shahid Mahmood;

### *A5.2.1 History of CAP*

In 1996 ten friends registered CAP (Community Action Programme). They included industrialists, an NGO representative and government officials. Their initial activities were concerned with providing education for garbage collectors.

In 1997 they established an office, using local resources. They undertook social research into marginalised groups in about 16 local settlements, including elements such as solid waste management, water and sanitation and operation and maintenance of infrastructure, capacity building of CBOs and microcredit. This provided information that would help them to work together with the community and the government.

By 2001 they have organised a lobby group of community organisations and are running five schools. Plans for the future include organising platforms among stakeholder and publishing a newsletter that will describe successful initiatives.

### *A5.2.2 CAP today*

CAP has a Board of six associate members who are volunteers, and office staff of two and six field staff who are teachers and a social worker. CAP works alongside 25 community-based organisations (five specialising in education and three in water supply and sanitation) which together represent 140,000 residents. Associated industrialists provide financial assistance to cover the running costs of cap and to support the education programmes. The following principles guide the development of CAP: -

- ◆ We want to stay small and effective
- ◆ We want to mobilise local resources
- ◆ We want to be independent of foreign funding

External funding is used for research, dissemination of information and risky innovations and small trials.

The mission statement of CAP is

Community empowerment, through organisational development and networking for  
*sustainable development.*

Cap acts as a catalyst, as a support organisation for official, semi-official and community-based organisations. It aims to assist community-based initiatives and help low-income urban communities to improve the coverage and quality of services. It facilitates dialogue between stakeholders.

### *A5.2.3 The context*

Faisalabad is the third largest city of Pakistan, with a population of more than 2 million and an area of 122 km<sup>2</sup>. It is set in the midst of a fertile agricultural region and has many textile factories. WASA, the Water and Sanitation Agency is mandated to develop, operate and maintain water supply, sewerage and drainage systems within the jurisdiction of the Faisalabad Development Authority

### *A5.2.4 The study*

#### *The need for the study*

WASA is unable to fulfil its mandate since many parts of the city do not have adequate services. it is experiencing difficulty in keeping the parts of the system that already exist in operational condition.

So the objectives of the study were to investigate the current arrangements for operation and maintenance (O&M) and make recommendations for improvements.

*Methodology of the study*

The research was concerned with the meanings behind social interactions, and an understanding of the way people subjectively experience their world.

Four strata of actors were identified, and samples from each were selected, as follows

Stratum	Number in each sample
WASA officers	10
WASA workers (sewer men)	24
Members of NGOs or CBOs where services were managed by the community	7
Members of NGOs or CBOs where services were managed by the Government	4

The survey was conducted by means of open-ended questions asked in interviews

#### A5.2.5 *Lessons learned*

- (a) The perceptions of WASA workers regarding the concepts of operation, maintenance, and sustainability were narrow and limited, as compared to the perceptions of WASA officers and members of NGOs regarding these concepts.
- (b) The planning process of WASA regarding operation and maintenance was perceived as more autocratic, passive and less practical in terms of implementability. The planning process needs to be changed to be more active, participatory, and more practical in nature.
- (c) The WASA response to the complaints lodged by individuals, especially powerless ones, was weaker than the response to the complaints lodged by NGOs/CBOs which were better able to put pressure on WASA staff. People of Faisalabad need to be organised into CBOs to get better services, and the attitude of WASA staff needs to be changed from serving the more powerful people, to serving people on a first-come-first-served basis.
- (d) Stakeholders were not satisfied with the billing procedure. WASA should review its billing procedure.
- (e) There is a paucity of funds in WASA. Instances of misuse of budget were also reported. WASA needs to plan for the generation of more funds and for ensuring their proper use.
- (f) The revenue collection procedure of WASA is faulty. It was perceived that about 50% of the people do not pay the charges. It needs to be streamlined.
- (g) The WASA-community linkages are weak. They need to be strengthened.
- (h) It was perceived that the top management of WASA is borrowed from other departments, and as a result the continuity of WASA policies suffers. The Government should be convinced to appoint a managing director from the WASA staff so that the continuity of the policies is ensured.
- (i) The work and efforts of NGOs/CBOs were generally appreciated by stakeholders. The procedure and process of effective NGOs/CBOs should be replicated in other areas by motivating people to organise themselves into NGOs or CBOs.
- (j) Most of the sewer men reported that people gladly pay them as a reward. But people from the community reported that the sewer men demand money. The monitoring of the work of the sewer men needs to be done jointly by WASA supervisors and public representatives.
- (k) The concept of the privatisation of WASA was appreciated by most of the stakeholders. Its strengths and weaknesses were identified. Members from the community (users) felt that WASA-NGO linkages should be developed instead of total privatisation of WASA.

- (I) The reasons for dissatisfaction of stakeholders with O&M services were identified as: Lack of training on the part of WASA staff, lack of staff motivation, negative behaviour of some WASA staff, negative behaviour of the users, corruption on the part of WASA staff, lack of funds for O&M, inadequate sewerage staff, and low salaries.

### **A5.3 Franchise Management of Solid Waste Services in Ghana**

by Lukman Salifu,  
Water and Sanitation Program,  
Africa Region

This case study describes the MERC (Micro Enterprise Refuse Collection) scheme for solid waste collection in Atonsu, Kumasi, Ghana. The Local Government was not able to sustain operation and maintenance expenditures and did not have the funds to replace vehicles. In eight years Kumasi had two generations of vehicles through British aid, and within 3 years of them arriving 90% were off the road. The Local Authority could not expand the service because the number of payers was limited, and to maintain the service the Authority was obliged to beg for more vehicles from donors.

The Local Government Act of 1993 promoted decentralisation, giving local governments considerable autonomy.

The National Development Planning System Law of 1994 gave District Assemblies the responsibility of preparing its own Five Year Development Plan, which should start with community consultation.

Fiscal decentralisation was not well done, allocating only 5% of all national revenues to be shared between the 110 Districts according to populations and "deprived area" status. A revenue generation clause committed Central Government to match any revenue increases that are achieved by the Districts.

The World Bank was asked for assistance for the five largest municipalities of Ghana. Because of the short service lifetime of the vehicles previously provided, the Bank was not prepared to simply fund more vehicles. Instead it proposed the introduction of a private sector service, with Kumasi divided into four zones.

Kumasi and Takoradi chose the franchising<sup>1</sup> system which had been so successful for public toilets and because it avoided some of the problems related to municipal financial management.

The coverage of solid waste management services was about 55% for urban areas and small towns, and about 20% in the rural areas. House-to-house collection was seen as appropriate for the 20 to 50% of the population at the higher income range, and surveys showed that residents in these areas were prepared to pay for the service. It was proposed that the remainder of the urban populations, living in areas which were regarded as unsuitable for a house-to-house service because of access problems, would be served by communal storage. Unfortunately, people in these areas were not willing to pay for this service. So the access conditions for the areas that had been classed as unsuitable for house-to-house collection were reviewed, and it was found that it would, in fact, be possible to collect from many of these areas by means of a house-to-house service.

A pilot system was set up in Atonsu, a typical low-income neighbourhood in Kumasi. The system provided primary collection, the waste being transferred to 10m<sup>3</sup> containers for subsequent

---

<sup>1</sup> In this connection, a franchise is an agreement that grants an exclusive right to a private sector operator to provide a defined service for a specified period in a specified location, and to collect the fees from the beneficiaries. The franchisee (operator) may be required to pay a periodic fee to the grantor for this privilege.

transport to the disposal site by the City Authorities. Performance monitoring was regarded as a priority. An important unit for this monitoring was seen as the Unit Committee – part of the local government structure and involving about 20 households.

It was decided that donkey carts would be the most suitable means of collection. Kumasi is twinned with the town of Almere in the Netherlands, and Almere provided two donkey carts for the purpose of collecting waste. Some farmers were already collecting food waste to use on their farms using donkey carts.

The franchisees were not chosen in a competitive way. The pilot area has 1500 houses, and on that basis it was decided that three donkey carts would be needed. Two local people with donkeys were offered the work. A third person, who did not have a donkey, protested that he had been excluded, arguing that he could easily buy a donkey if he was awarded the work, so he was also engaged.

At first the residents were very enthusiastic about the service, and discarded large amounts of bulky waste as they used the opportunity afforded by the new service to clean out their houses. Later, however, some women residents complained about the waste collectors because of the allegedly cruel way that they treated their donkeys.

Since a franchise model had been chosen, the fees were collected by the waste collectors. It had been expected that a significant proportion of the households would not pay initially, so a 25% subsidy was built into the programme for the first year, reducing thereafter. In fact the fee collection efficiency was 91% at the start, but declined, according to the franchisees, to 81% by the tenth month of operation. The City was not able to monitor the collection of fees, so it is thought likely that the waste collectors gave a lower figure for fee collection in order to benefit from the subsidies. This declining subsidies arrangement is seen as a big flaw in the project design. The costs of secondary collection and disposal were borne by the City.

Because of the complaints about the mistreatment of the donkeys a tractor and trailer system was introduced, but this was significantly (60%) more expensive.

An NGO – Catholic Graduators for Action (CAGA) has been advising the franchisees and the community.

## A5.4 Maintaining rural water supplies in Lesotho

by Makhotso Lemphane

### A5.4.1 *Background to the current situation*

When the Lesotho Department of Rural Water Supply (DRWS) was set up in 1970, the responsibility for maintenance was handed over to the communities immediately after construction. DRWS undertook routine servicing of diesel pumps and responded to breakdown reports. This arrangement was not successful because communities often did not report breakdowns and there were long delays before the DRWS was able to repair some systems – if they were repaired at all. These problems were exposed in a consultant's report. This state of affairs led to a reconsideration of the strategy for maintenance of water supply systems. The new approach included decentralising, using the private sector and increasing the emphasis on preventive measures. Since the choice of technology and equipment also had a major influence on reliability and the ease of making repairs, considerations of maintenance implications were brought into the feasibility study stage.

The presenter wrote that "People will always be willing to pay a reasonable amount of money for maintenance provided that there is a real local capability to undertake the work successfully, and provided that they believe that they are getting value for money. It is totally incorrect to conclude that failure to operate and maintain a system is only caused by the unwillingness of people to pay for operation and maintenance."

Two possible approaches are considered for improving maintenance.

#### *A5.4.2 Alternative 1 – the Area Minder system*

The key new factor in the new approach is the *Area Minder*, who is a contractor who is engaged to undertake repairs of a number of systems in a given area. The new model of maintenance management envisages complete decentralisation of maintenance so that the community will be responsible for paying the Area Minder for repair work that he/she carries out. The Area Minder will be paid a retainer by the DRWS, but will be paid for work done by the community that benefits from this work. During a transition phase, Government will help communities by covering a portion of these payments. In addition, regular inspections of water systems are to be carried out so that problems are discovered before they lead to breakdowns.

Area Minders will liaise with Water Minders (of each community) and the Village Water Committees. The extent of the area they serve will be determined so that it is large enough to provide a sufficient income. They will be contracted by the Government for periods of three to five years.

A key factor to be considered is the motivation of the village water minders, since currently they are not paid for the work they do.

#### *A5.4.3 Alternative 2 - Communities contracting directly*

The long-term aim is that communities contract directly with the private sector for maintenance work.

There are three prerequisites for this approach to be successful:

- ◆ Communities accept full responsibility for ownership, operation and maintenance of water systems.
- ◆ Local contractors are available to provide cost-efficient services of good quality.
- ◆ Spare parts and materials for maintenance of water systems are available locally.

At present 2-year contracts are let for contractors to install and maintain pumping systems. Most of the contractors involved are based in the capital, Maseru.

The next step would be to identify potential contractors outside the capital who are interested in undertaking maintenance work, and engage them for specific maintenance assignments as the existing contracts with Maseru-based contractors expire. Major equipment may continue to be supplied by contractors based in the capital.

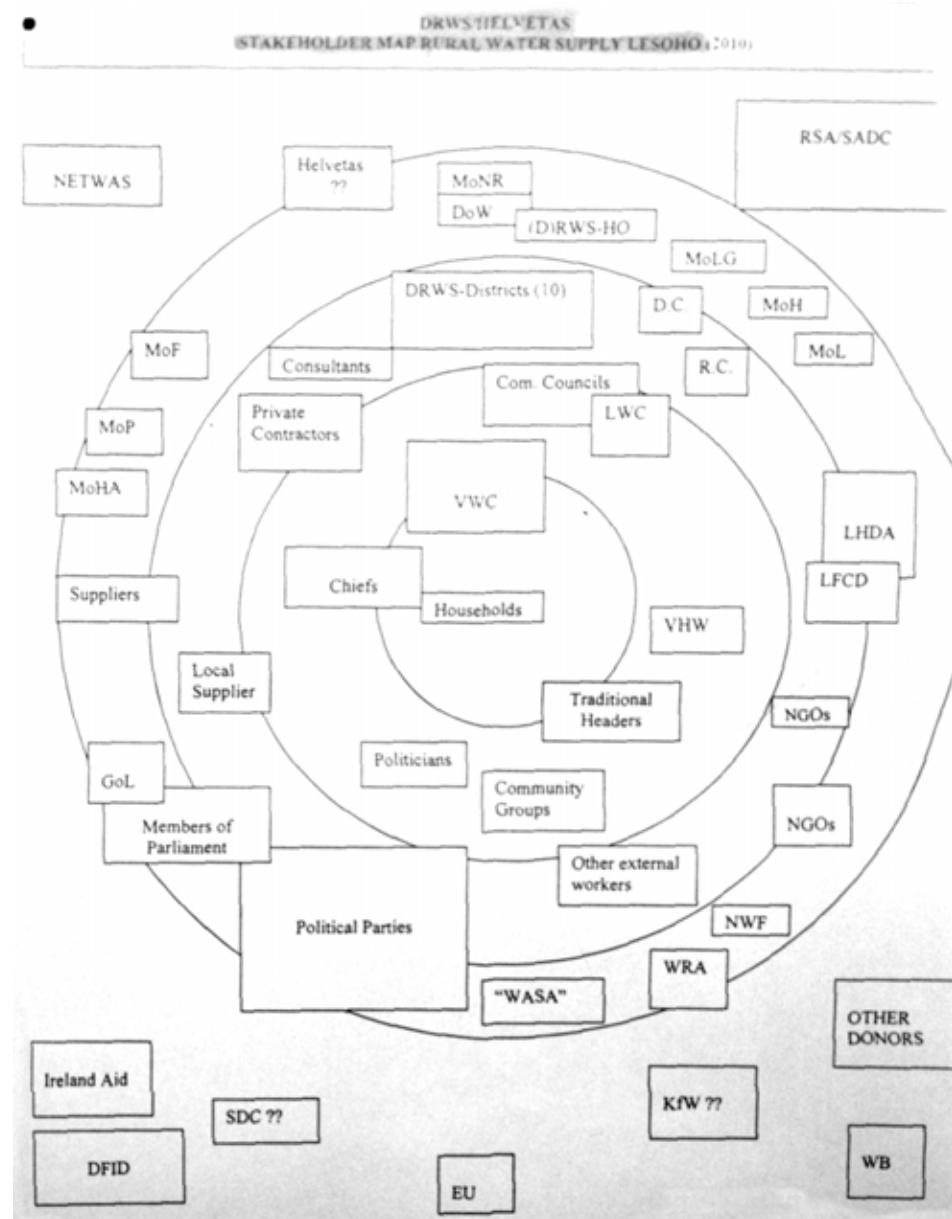
Based on the performance of the district contractors in these specific jobs, competent contractors could be prequalified for greater involvement in maintenance work.

In the longer term (five to ten years) district contractors will be encouraged to tender for installation and maintenance work. The awarding of tenders would be overseen by tender boards. Communities would be encouraged to deal directly with these contractors.

The tasks involved in establishing such a system include administration of procurement, developing and implementing the maintenance strategy, developing model contracts and rules for contracting, and training contractors to comply with these procedures and meet quality standards.

#### A5.4.4 Stakeholders

Figure A5.1 shows the stakeholders who are concerned with rural water supply located on the diagram used for the *Household-centred Approach* (the topic of the 2000 Aguasan Workshop).



**Figure A5.1 Stakeholders on a Household-centred Approach diagram**

## Annex 6 – Some insights, lessons and action plans

As mentioned in Section 2.12 ("Harvesting"), participants were asked to write two insights that they had gained and two lessons that they had learned from the Workshop, and also to write what their first action would be on their return. These were displayed and each person was given one vote to attach to the saying that they considered most important. The points that received votes from others are presented first, followed by other insights, lessons and plans. These points have been organised roughly according to topic. After a list of the actions that participants said they would take on their return, there is a personal comment from one of the case study presenters.

### A6.1 Insights and lessons learned

#### a) Ideas receiving votes

*Four votes*

- ◆ It is more effective to be approximately right than perfect but stuck to an old paradigm (take some risk)

*Three votes*

- ◆ Don't be shy to explore crazy ideas

*Two votes*

- ◆ I need to become aware of my implicit paradigms and find methods for reversing them.
- ◆ I have been reminded of the importance of working together.
- ◆ Mind jogging in a team stimulates creativity (much more effectively than working alone).

*One vote*

- ◆ The challenge is to take the risk to change whatever the consequences.
- ◆ It is possible to step back and develop a new view.
- ◆ I have learned the importance of mindset.
- ◆ Wearing a different hat is very useful, even if at first you can't imagine what it would be like.
- ◆ Paradigm shift is a precondition and an engine to change behaviour.
- ◆ I have been shifting paradigms for a long time without knowing it. I now know better how to systematise shifting paradigms with various tools.
- ◆ It needs a lot of discipline to apply "mind jogging" tools and not to fall back into the usual way of thinking.
- ◆ Being revolutionary takes hard work and discipline.
- ◆ It is important to go beyond the given context and boundaries to discover new paradigms.
- ◆ It is important to look beyond the boundaries.
- ◆ Linear methods of problem solving are not always effective – one has to be creative and bold to meet new challenges.
- ◆ It is important to look at things from a distance, from outside, from below and above, and with the eyes and the hearts of others.
- ◆ Reversal of the background and the foreground can lead to new (revolutionary) ideas. (It is worthwhile to take time to reflect and make use of appropriate tools.)
- ◆ On my return I will use the framework that was used for the case studies in the planning of our annual policy workshop.

- ◆ When I get home I will discuss the workshop with my family members, with my boss and with other colleagues.

### **b) Other insights and lessons learned**

#### *Paradigm shifts*

- ◆ There are many shifts in paradigms to consider when solving problems.
- ◆ I have learned how to facilitate a paradigm change
- ◆ We need to move from multidisciplinarity to transdisciplinarity.
- ◆ All the time I am guided by paradigms which I am not aware of. I want to try to question my paradigms.
- ◆ Economic benefits are important motivators for changes of paradigms.
- ◆ It is important to be aware of paradigms.
- ◆ Each of us has many paradigms, and could become better people by shifting some of them.
- ◆ The support or motivation of decision-makers is crucial for new solutions.

#### *New mindset*

- ◆ We need to look at familiar things with a new mindset.
- ◆ We need a new approach for operation and maintenance.
- ◆ We are in a pot, and it is difficult to get out of it.
- ◆ The workshop methodology to long-term reflective (brainwork) processes.
- ◆ It is important to make room for changes.
- ◆ Shifts in mindsets require practice to become effective

#### *Different perspectives and boundaries*

- ◆ We need to view things from a different perspective
- ◆ We need to look at each situation from different points of view
- ◆ Now I understand the importance of stepping outside the given system.
- ◆ Every problem should be seen from different perspectives and angles.
- ◆ Differences of opinion are not necessarily different opinions but how people see from different perspectives.
- ◆ Stepping out of the context is a lot of fun.
- ◆ I have learned to analyse issues and problems from different angles.
- ◆ There are different views to a thought, idea or opinion.
- ◆ We need to learn to look at things from the other end of the table and to stretch like a rubber band.
- ◆ It is useful to look at the world (things and problems) with different eyes and with a wider view.

#### *Content and context, and figure / ground reversals*

- ◆ We need to separate the foreground and background of a situation.
- ◆ There are more things to consider in the background in solving a problem than what is seen in the foreground.
- ◆ We need to analyse the content of the tasks we are working on
- ◆ I have started to understand the difference between context and content.
- ◆ Analysing the background is essential in identifying the crucial aspect of the problem.

- ◆ In some situations information about the background helps us to "step out" of established norms.
- ◆ The most important concept has been figure / ground reversal

*Different hat, profession*

- ◆ We need to try to find solutions for tasks and problems from different points of view.
- ◆ It is useful to approach problem solving from dimensions other than those associated with my profession.
- ◆ It is useful to approach tasks and problems from very different viewpoints, even if it seems illogical.

*Tools and games*

- ◆ There are many tools for developing our thinking. We need to use them.
- ◆ Now I have more tools for creative thinking.
- ◆ The new concepts provide suggestions for improving the effectiveness of my work.
- ◆ Games are very useful and stimulating.
- ◆ There are different methods to look at situations and systems in order to promote change.
- ◆ There are still other tools to see. See one tree in the forest.
- ◆ I have seen how different problems are solved in different areas and countries, and I have some new tools to help me approach old problems in new ways.

*Working together, getting insights from others*

- ◆ It is important to share ideas and views with other people of different cultures.
- ◆ We need to take more from other participants
- ◆ I have become more aware of the importance and difficulty of teamwork.
- ◆ I need to seek alternative viewpoints from my colleagues.
- ◆ It is practical and effective to develop ideas together.
- ◆ It is important to discuss not only problems, but also the ordinary aspects of work and life with friends (both women and men) of other disciplines.
- ◆ It is important to obtain views of outsiders also before making decisions.
- ◆ Working together in a structured way can be powerful and creative
- ◆ Working in groups can be very stimulating and creative.

*General*

- ◆ I have learned that engineers are not square headed.
- ◆ Revolution is not always bloody.
- ◆ Information, education and mobilisation are necessary for project success.
- ◆ It is important to have a legal framework.
- ◆ Nothing is too small that it cannot influence a situation.
- ◆ Community participation in projects does not automatically assume responsibility. Terms of interaction should be very clear.
- ◆ The workshop has provided me with a chance to evaluate my work.
- ◆ Practical examples are more effective than theory.
- ◆ S'is gwiss, dass nix gwiss is (= It is certain that nothing is certain.)
- ◆ Solutions evolve if you trust (like a blind man) and give time.

**A6.2 Action plans - tasks on returning**

- ◆ I will read the handouts and integrate the new thinking and approaches into my day-to-day life.
- ◆ I will look for the controlling paradigms in my research project.
- ◆ I will experiment with some of the figure / ground reversal approaches towards O&M.
- ◆ I will try to use the paradigms approach in my daily work.
- ◆ I will develop materials of paradigm shift and revolutionary concepts that are appropriate to our own situation.
- ◆ I need to learn to see issues through the eyes of other people and other professions.
- ◆ I want to use the insights I have gained in developing the next 5-year plan.
- ◆ To advocate and work for a change of paradigm on the involvement of the private sector in O&M in
- ◆ rural and semi-urban contexts.
- ◆ I want to consider and analyse the "unspoken" aspects of our projects.
- ◆ Disseminate what I have learned before I forget it.
- ◆ I will discuss with partners to try to see what paradigms we are basing our work on, and to think about a new concept for the next phase of our project.
- ◆ To prepare for a difficult meeting, where there is likely to be conflict, I will consider, with colleagues' different viewpoints and standpoints.
- ◆ Introduce some tools for shifting paradigms into project evaluation. Adapt the workshop methodology to the overall evaluation and planning processes used in my office.
- ◆ I want to try to make myself and my colleagues aware of "our" paradigms.
- ◆ I will present a case study to students and my successor and encourage them to challenge the prevailing paradigms.
- ◆ I want to find out what Jesus, Buddha and Mohammed mean to certain topics of daily life.
- ◆ I will share my experiences with my staff and look at implementation problems with a new mindset.
- ◆ I plan to circulate some of my key project concepts to many people and then "toss them around" in discussion to find out how they see them.
- ◆ I will tell my wife about the workshop and possibly we will gain some new insights together.
- ◆ I will include ideas I have gained from this workshop in the documents that I must write for my project.
- ◆ I will think about how to build up the readiness of the project team and partners to engage in "brain jogging", which will be needed to convince the donor of the need for a further phase of the project.
- ◆ I need to implement an operation and task organigramme.

**A6.3 Comment from a case study presenter**

from Shahid Mahmood

Revolution is a dangerous word to talk about. It is very important to have a goal and a clear vision of what you are talking about. To me revolution does not mean inventing things, but it is more to do with self-discovery - that is the actually the starting point.

At the Aguasan workshop last year I presented a technical case study describing some of CAP's work. The workshop was about the "Household-centred approach". The participants were more interested in the details of the case study than in the process approach of CAP.

This year the topic of the workshop was not technical so the participants looked at my presentation in a different way. I got more feedback regarding the approach of CAP. I found it very useful. I really enjoyed it and learnt a lot, when my colleagues in our case study group did a thorough review of CAP's approach and gave me some useful feedback. Their ideas will help me to look at things in different ways.

I am of the view that we cannot change the world in days, but at least we can start some processes that will lead to improvements.

Sometimes it is important to change the pattern of routine work as the Aguasan Group did this year. All credit goes to the workshop organisers who, although engineers, took such a bold decision.

"To look at things in a different ways" That is very important message.

For me this was not a routine workshop for relaxation and sightseeing. It gave me an opportunity to evaluate the work I have been doing over the last year.

Once again I am thankful to all the Aguasan members, especially Karl and Armon, who provided me with the opportunity to attend this workshop.

## Annex 7    Global partners in water supply and sanitation

Summary of presentation by Armon Hartmann

### **The context of the SDC involvement in water and sanitation and collaboration with global partners. Introducing the roles of the World Water Council, the Global Water Partnership, the Water Supply and Sanitation Collaborative Council and the World Bank Water and Sanitation Programme.**

The Earth's population is growing, but the available water resources are becoming less.

In 1950 about 20 million people were living in areas of water scarcity. By the year 1990 this number had increased to 300 million, and it is estimated to reach 6000 million (2/3 of the estimated World population) by 2050.

If there are 1300 m<sup>3</sup> of water available for each person per year, the water resources are said to be adequate. If the available water is between 1000 and 1300 m<sup>3</sup> per person each year there is said to be a situation of water *stress*. If the annual volume falls below 1000 m<sup>3</sup> per person there is a water *scarcity*.

The City of Beijing is an example – the groundwater that supplies the City is becoming polluted, and the water table is dropping. What are the solutions? One is to bring water to the people, and the other is to move the people to where the water is. It appears that consideration has already been given to the possibility of moving Beijing to a new site because of this problem.

The World Water Council and the Global Water Partnership try to create awareness about the development of critical situations concerning water resources as described above. They seek to develop and implement strategies and policies that will achieve world-wide sustainable and integrated water resource management (IWRM). This concerns water for domestic consumption. Water is also needed for food production. (70 to 80% of water consumption is for irrigation and food production, but because of inefficient irrigation methods 60% of irrigation water does not reach the plants.) The natural environment needs water. Industry and power generation are also consumers. The needs of all these different sectors are brought together in integrated water resources management, which requires policies, tools and institutions. (A useful review of measures for reducing consumption can be found in the reference by Hawken et al. which is mentioned in the bibliography in Annex 2.)

Within the IWRM, specialised international agencies have been appointed to take the lead in the three main associated programmes. The Water and Sanitation Programme of the World Bank is the associated programme of the Global Water Partnership dealing with "Water for People" (drinking water, sanitation and hygiene education) Others include the FAO (concerned with food production) and the IUCN which has particular interest in ecological issues.

The Regional Offices of the Water and Sanitation Programme (WSP) are as follows:

East Asia and the Pacific	Djakarta
South Asia	Delhi
Eastern and Southern Africa	Nairobi
Western Africa	Abidjan
Latin America (Andean)	Lima

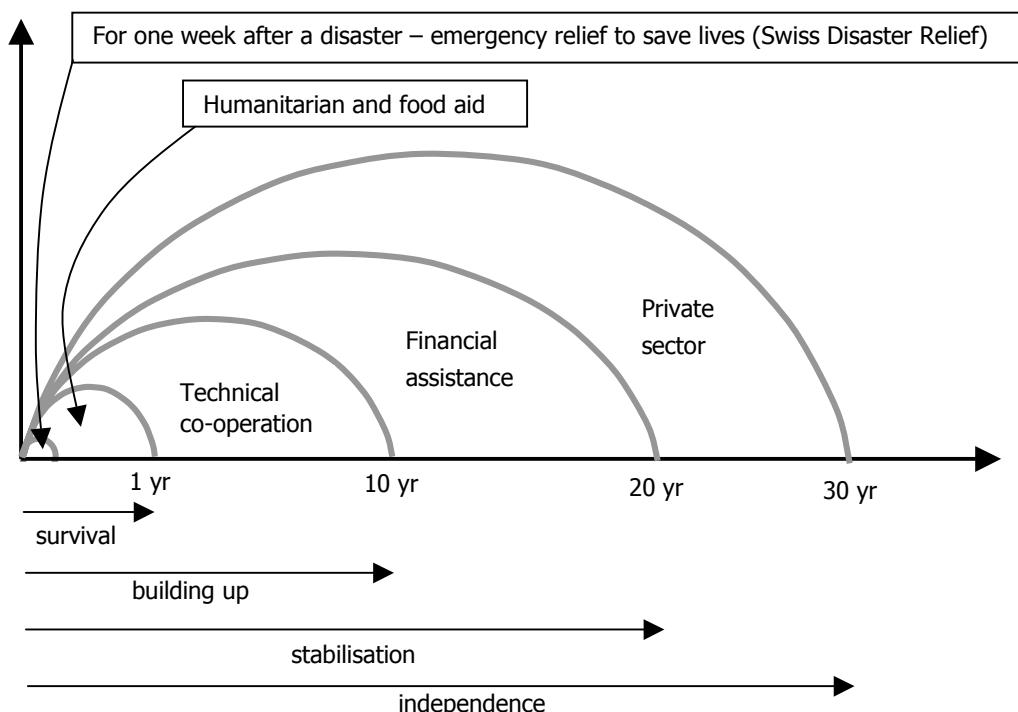
The WSP has three main centres of activity:

- Policies and strategies
- Institution building, and
- Knowledge management. As part of the knowledge management component, the Programme has produced many booklets in various languages, and they are made freely available.

There is SDC co-financing for the WSP at all levels – Washington (international), regional and national, with particular national focus on Bangladesh, Pakistan and Peru.

The Water Supply and Sanitation Collaborative Council (WSSCC) was set up in the 1990s, and since then has developed a network which includes almost all countries. It is particularly concerned with the exchange of information. It has promoted *Vision 21* which is dedicated to the goal of bringing hygiene and sanitation to the 1.5 billion people who do not have access to good water and the 2.5 billion who do not have any satisfactory means of sanitation. The WSSCC has also developed the Household-centred Approach, (HCA), which was the topic of the Aguasan Workshop of 2000. (A few copies of that report are still available from SKAT.) The HCA was presented and accepted at the World Water Forum 2000 in The Hague.

The continuum from emergency relief in disaster situations through to long term development, as illustrated in the Figure A7.1, below is an important basis for SDC's activities.



**Figure A7.1 The Emergency – Development Continuum**

More information is available on Watsan–Web : - [http://www.skat.ch/ws/link/watsan/ww\\_index.htm](http://www.skat.ch/ws/link/watsan/ww_index.htm)

This presentation lasted about 20 minutes. During these 20 minutes nearly 100 children died from diarrhoeal diseases related to drinking water of bad quality.

## Annex 8 – Summaries of evening presentations

### A8.1 Household level solar disinfection of drinking water

Video and discussion led by Martin Wegelin of SANDEC

This technique for solar water disinfection (abbreviated to "SODIS") involves filling plastic soft drink bottles with clear water from unprotected sources and leaving them in the sun for five hours so that the temperature and the sunlight kill the pathogens in the water. The technique was developed ten years ago when trials started at EAWAG in Dübendorf (Switzerland) before being extended to countries in Africa, Asia and Latin America for field trials, social acceptance trials and the development of tools and guidelines. More information on SODIS is available on the website [www.sodis.ch](http://www.sodis.ch).

### A8.2 Innovative video on water supply from Mozambique

introduced and shown by Kaspar Grossenbacher of Helvetas

The video is set in a region of northern Mozambique where about 170,000 people live on a 300m plateau where there are no natural water sources. The Portuguese built systems to pump water up to the plateau, but there are frequent operation and maintenance problems, including lack of fuel, thefts, sabotage and conflicts. As a result women have to go for long distances looking for water and so may be away from home for up to two days, causing husbands to feel jealous. The video tells a true story of a husband who became jealous because of the problems with the water supply. Because of his jealousy he damaged some water supply taps and was jailed for 6 months. This video shows in a direct and human way some implications of the lack of a convenient water source that technically-oriented people might never have thought of. It suggests a new and effective way of raising awareness of water supply issues. The title of the video is "A Marital Affair".

### A8.3 Web site for healthcare waste management

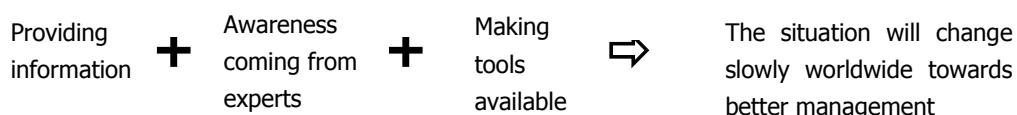
presented by Franck Bouvet of Emergence

Emergence had been awarded a contract by WHO to develop a web site for disseminating information about healthcare waste management (concerning wastes from hospitals, clinics, laboratories and other places where potentially hazardous wastes are generated as a result of the practice of medicine). The address of the site is [www.healthcarewaste.org](http://www.healthcarewaste.org)

The current "state of the art" was characterised as

- a lack of involvement at the political level
- a lack of funds and regulation
- no organisation or management of the healthcare waste stream, neither on-site nor at the regional or national level
- no awareness and no training, and
- no data on nosocomial infections related to healthcare waste management,  
in other words, no interest.

The paradigm of the website development work was explained as: -



**A8.4 Rainwater harvesting**

by Hans Hartung of FAKT

Rainwater harvesting is a system for water supply that fits well with Vision 21, the Household-centred Approach, and other recommendations and priorities that have been identified in relation to water supply. There are many examples of successful use of this means of water supply. India has a long tradition of rainwater harvesting – a tradition which is currently being revived. Developments in Thailand have brought the cost of storage jars down to an affordable price. In Kenya, where 10,000 people rely on rainwater supplies, techniques have been developed to build ground tanks with capacities of 50 m<sup>3</sup>. In north-central China storage tanks are large enough to support the irrigation needs of one hectare of cultivated land. The Daimler-Chrysler complex in Germany uses rainwater harvesting to provide water and dramatically reduce drainage costs. Brazil wants one million new systems in the next five years to meet the needs of the drier parts of the country. Water collected from roofs and prepared surfaces is used for drinking water, for other domestic purposes, for agriculture and for emergency purposes.

Water quality improves when stored well, contrary to popular belief. Bacteria die off very rapidly and do not survive more than 8 to 10 days in dark conditions where no animals are present.

The *Tenth International Conference on Rainwater Catchment Systems* is being held in Germany in September 2001. More details are available at [www.rainwaterconference.org](http://www.rainwaterconference.org)

## **Annex 9 – List of participants**

## Lakshman Attanayake

National Water Supply & Drainage Board, Getambe, Peradeniya, Sri Lanka  
midwater@slt.lk phone: +94 8 387 149 fax: 94 8 388 027

# Lawrence Bezeng

Helvetas Cameroon, P.O. Box 114, Bamenda, Cameroon  
bezeng@helvetascameroon.org, phone: +237 36 17 30 fax: +237 36 22 30

Gilbert Bieler

Programa Aguasan/Cosude, Apartado postal 01-391, San Salvador, El Salvador,  
elsalvador@aguasan.org phone: +503 264 03 81 fax: +503 264 03 81

Franck Bouvet

Emergence, 233, chemin du Canada, 74130 Bonneville, France  
franck.bouvet@emergence.cc phone: +33 4 50 94 90 90 fax: +33 4 50 25 28 89

Jacques Bovier

DEZA/SKH Nairobi, Freiburgstr. 130, CH-3003 Bern, Switzerland  
sdckenya@form-net.com

**Adrian Coad**

SKAT, Vadianstr. 42, CH-9000 St.Gallen, Switzerland  
adrian.coad@skat.ch phone: +41 71 228 54 34 fax: +41 71 228 54 55

Hedi Feibel

Universität Darmstadt ZIT, Hochschulstrasse 1, D-64289 Darmstadt, Germany  
feibel@zit.tu-darmstadt.de phone: +49 6151 16 40 65 fax: +49 6151 16 67 52

Bernhard Fischer

Caritas Innsbruck, Heiliggeiststrasse 16, 6020 Innsbruck, Austria  
bernhard.fischer@dioezese-innsbruck.at phone: +43 512 727 063 fax: +43 512 727 060

**Urs Fröhlich**

Finkenweg 9, CH-8500 Frauenfeld, Switzerland  
fröhlichwater@bluewin.ch phone: +41 52 721 31 00 fax: +41 52 721 31 00

Franz Gähwiler

Helvetas Zürich, Postfach, CH-8042 Zürich, Switzerland  
franz.gaehwiler@helvetas.ch      phone: +41 1 368 65 00      fax: +41 1 368 65 80

Klaus Grossenbacher

helvetas@teledata.mz phone: +258 1 42 15 95 fax: +258 1 42 15 96

Halle W. Hallenmaier

Development Workshop, CP 3360, Luanda, Angola  
haile.dwang@angonet.org      phone: +244 2 44 83 71      fax: +244 2 44 94 94

# **Joseph Halder**

NGO Forum for Drinking Water Supply and Sanitation, 4/6 Block E, Lalmoni, Dhaka 1207,  
Bangladesh  
ngof@bangla.net phone: +880 2 811 9597/99 fax: +880 2 811 7924

**Armon Hartmann**

Senior Water Advisor, DEZA SDC Social Development Division, Freiburgstr. 130, CH-3003 Bern, Switzerland  
 armon.hartmann@deza.admin.ch      phone: +41 31 325 9252      fax: +41 31 325 9357

**Hans Hartung**

FAKT Weikersheim, Kanalstrasse 23, D-97990 Weikersheim, Germany  
 hfhartung@cs.com      phone: +49 7934 99 00 30      fax: +49 7934 99 00 31

**Frank Haupt**

Infraconsult AG Bern, Bitziusstrasse 40, CH-3006 Bern, Switzerland  
 frank.haupt@infraconsult.ch      phone: +41 31 359 24 24      fax: +41 31 359 24 25

**Neil Gamini Herath**

Helvetas Sri Lanka, 21, Raymond Road, Nugegoda 0170, Sri Lanka  
 hslneil@eureka.lk      phone: +94 1 82 73 24      fax: +94 1 82 73 25

**Julian Jones**

SKAT, Vadianstr. 42, CH-9000 St.Gallen , Switzerland  
 julian.jones@skat.ch      phone: +41 71 228 54 41, fax: +41 71 228 54 55

**Andreas Knapp**

IWGA SIG/Institut für Wasservorsorge Gewässerökologie und Abfallwirtschaft, Muthgasse 18,  
 A - 1190 Wien, Austria  
 knapp@iwga-sig.boku.ac.at      phone: +43 1 360 06 Extn 5806      fax: +43 1 368 99 49

**Makhotsi Lemphane**

Department of Rural Water Supply, P.O. Box A165, Maseru 100, Lesotho  
 nmc@drws.org.ls      phone: +266 326 047      fax: +266 310 199

**Guy Morand**

Helvetas Haiti, P.O. Box 15030, Petion-Ville, Haiti  
 helvetas@haitiworld.com      phone: +509 245 35 21      fax: 509 245 97 29

**Hajrie Morina**

SDC, Mother Theresa Avenue 49, 38000 Pristina, Kosovo  
 hajrie\_a@yahoo.com      fax: +381 38 548 091

**Josef Müller**

SKH / SDR, P.O.Box 3099, Asmara, Eritrea  
 sdrjam@eol.com.er      phone: +291 1 185 538      fax: +291 1 182 735

**Bethuel Netshwinizhe**

Mvula Trust Braamfontein, P.O. Box 32351, Braamfontein 2017, Johannesburg, South Africa  
 bethuel@mvula.co.za      phone: +27 11 403 3425      fax: +27 11 403 1260

**Abongwi Esther Numfor**

Cameroon Association of Rural Development, P.O. Box 688, Ntarikon-Bamenda N-W Province,  
 Cameroon; c/o Allied Engineers: alliedbda@bdanet.cm      phone:+237 36 22 10

**Ram P. Risal**

Helvetas Nepal, GPO Box 688, Kathmandu, Nepal  
 rr@helvetas.wlink.com.np      phone: +977 1 52 49 25      fax: +977 1 52 67 19

**Snezana Rovcanin**

Banja Luka Regional Water Supply and Sanitation Programme, FRISA Engineering, Ive Andrica 14,  
78000 Banja Luka, Bosnia & Herzegovina  
frisa-bl@blic.net phone: +387 51 220 170 fax: +387 51 220 171

**Lukman Y. Salifu**

WSP-Africa, Hill Park Building, World Bank, Nairobi, Kenya  
Lsalifu@worldbank.org phone: +254 2 260 300 fax: +254 2 260 386

**Mahmood Shahid**

70 Gulshan Habib, Near petrol pump, Hajiabad, Faisalabad, Pakistan  
cap@fsd.paknet.com.pk phone: +92 41 78 13 77 fax: +92 41 61 79 40

**Elisabeth Stern**

Lindenhof 3, 8852 Altendorf, Switzerland  
estern@bluewin.ch phone: +41 55 442 23 73

**Martin Wegelin**

SANDEC/EAWAG, Postfach 611, CH-8600 Dübendorf, Switzerland  
martin.wegelin@eawag.ch www.sodis.ch www.sandec.ch  
phone: +41 1 823 52 86 fax: +41 1 823 53 99

**Karl Wehrle**

SKAT, Vadianstr. 42, CH-9000 St.Gallen, Switzerland  
karl.wehrle@skat.ch www.skat.ch phone: +41 71 228 54 54 fax: +41 71 228 54 55

**Piyasena Wellakkage**

Community Water Supply & Sanitation Project, 9th floor, "Sethsiripaya", Battaramulla, Sri Lanka  
piyasena@sri.lanka.net phone: +94 1 872 144 fax: +94 1 872 143

**Tonino Zellweger**

LBL Landwirtschaftliche Beratungszentrale Lindau, CH-8315 Lindau, Switzerland  
tzellweger@access.ch phone: +41 52 354 97 00 fax: +41 52 354 97 97

**Chris Zurbrügg**

SANDEC/EAWAG, Postfach 611, CH-8600 Dübendorf, Switzerland  
zurbrugg@eawag.ch phone: +41 1 823 54 23 fax: +41 1 823 53 99

## Annex 10 – Review of comments in evaluation questionnaires

Participants were given a standard SDC assessment form so that participants could give their opinions about the workshop. The following comments give an indication of the feedback that was provided.

*What were your expectations prior to the workshop?*

- ◆ Exchange of experiences.
- ◆ New methods of comprehension.
- ◆ To get some ideas for solving problems related to water supply.

*Was participation at the workshop of use for your activities?*

- ◆ Mind opening
- ◆ The workshop content is very much applicable in any situation for any professional in any kind of activity.

*What insights did you gain, and how do you intend to use them in your future professional activities?*

- ◆ The method of approaching problems, which can be used in other workshops.
- ◆ There are so many options for solving any particular problem – so many values and paradigms. I will try to utilise them.
- ◆ Looking at things differently, in different perspectives, giving due respect to the views and observations of others.
- ◆ There is much more in the background of a situation than what is in the foreground.
- ◆ I attended last year's workshop and took away with me many things (suggestions) on how I can improve my work. The same happened this year as well.
- ◆ It is possible to step back and develop a new attitude towards problems and challenges. I will use my insights and learning in developing new project ideas and in evaluating on-going programmes and projects.

*How do you judge the workshop documents?*

- ◆ The background paper was tough reading.

*Please comment on the overall impression of the workshop (organisation, room facilities, etc.)?*

- ◆ As usual, top quality
- ◆ The perfect place for a workshop.

*Any additional comments you wanted to mention – personal suggestions*

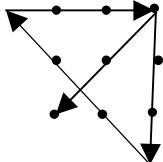
- ◆ The workshop should be organised in some other countries also.
- ◆ As a whole, the workshop concluded well. The sequencing of the content was excellent. The doubts and uncertainties at the initial stages were dramatically changed as the workshop unfolded and culminated into a good climax at the end. Credit goes to Elisabeth and Tonino. However a little monotony is creeping in with regard to the setting, even though the services and facilities at Hotel Rotschuo as well as the beauty of Gersau as a whole are excellent. . . It would be really nice if the Aguasan workshop can be staged alternately in Asia, Africa, Latin America and Europe.
- ◆ I found the workshop very useful in the way that this opportunity provided me with a chance to evaluate my own work. I got some feedback (which) definitely will help me to improve my work.
- The good thing about the workshop is that the organisers are focusing on the organisations working at grass-root level, so that they can share their field experience with other participants.
- ◆ I hope that the very successful Aguasan workshops will be continued. I particularly appreciated the comprehensive preparation of the workshop and the preparation by SKAT and the preparation group.

## Annex 11 – Solutions and contributions

### Section 3.1 "Welcome home, dear"

There were many suggestions for the differences in the way the returning men reacted. These included the concept of inheritance, different views on marriage, a belief that the pregnancy period could be much longer than nine months, and the understanding of how women become pregnant. In the case mentioned, the men from New Guinea believed that their women became pregnant via the ancestors when swimming in the lagoon.

Figure 3.1



### Section 3.7.1 Which floor?

Suggestions included that he walked up the stairs for exercise when he was not being observed and was not wearing a hot raincoat, or perhaps some connection with muddy footprints. The answer was that he is a short (i.e. vertically challenged) man who cannot reach higher than the lift button for the 10<sup>th</sup> floor. When it is raining he can press the button with his umbrella, and when accompanied, he can ask the other person to press it for him. The contributions of many people helped in widening the range of issues that were considered.

### Section 3.7.3 What's for dinner – goat or cabbage?

First take the goat. On the next trip take the cabbage and on the return, bring back the goat. Leave the goat on the initial river bank and carry the wolf across. Finally come back for the goat.

The key to solving this problem is to realise that an item can be brought back after it has been taken across.

### Section 3.7.3 Using a barometer.

Some of the solutions assume that the barometer is mounted on a piece of wood so that it has a significant length.

1. Measure the change of air pressure and use this to calculate the difference in altitude between the base of the building and its top.
2. Measure the length of the shadow of the building and the shadow of the barometer.
3. Use the barometer as a measuring stick to measure the height of one floor, and multiply by the number of floors.
4. Tie a string to the barometer and let it down from the roof; measure the length of string used.
5. Throw the barometer from the roof and measure the time taken for it to hit the ground.
6. Give the barometer as a present to the architect who built the structure to find out from him/her how high it is.
7. etc (Space for the reader to fill in the other four methods)

### Section 3.7.3 My life and a stapler

My life is like a stapler in that I cannot function without outside inputs, just as a stapler needs staples.

My life is like a stapler in that, if I abuse my body, I will not be able to function properly.

My life is like a stapler in that its significance comes from many small events.

My life is like a stapler in that I need to be pushed to achieve anything.

My life is like a stapler in that I am different from others and have a part to play in the bigger picture – an office needs computers and telephones and hole punchers as well as a stapler.

My life is like a stapler in that I should not underrate the importance of little things (like staples).

My life is like a stapler in that when I am needed for something important, I have always run out of staples.

My life is like a stapler in that when I try to do too many things at once, I do nothing properly.

### Section 3.7.3 Two groups of three.

(1) needle and thread, (2) pocket calculator, (3) balloons, (4) shell, (5) vase, (6) suitcase.

Examples 1, 2 and 6 all contain some metal, the others do not.

1, 2 and 6 all contain two or more words.

3, 4 and 5 are all decorative.

1, 2 and 6 are all needed when on a business trip.

### Section 3.7.3 Useful paper clips

Fixing sheets of paper together

A toy to fiddle with

Making hooks

Hanging cards on a string

Making jewellery

Picking locks

Keeping me occupied when I am nervous

Unblocking a glue tube

Cleaning my ears

Marking my place in a book

### Section 3.7.3 Paper clips strike a blow in salmonella scare.

Paper clips could be used to clip warnings to supermarket shelves. Paper clips could be used to scratch labels of suspected goods so that they can be identified for removal.

### Section 3.7.5 Figure / ground reversal



The original picture has been modified slightly to make each character easier to see. In the top picture has been modified to accentuate the young lady, and in the lower the old lady is more clearly featured. The lower part of the nose of the old lady is the jaw of the young woman.

## Annex 12 – The topics of past Aguasan Workshops

<b>Titles</b>	<b>Thematic Field</b>	<b>Author of report</b>	<b>Date</b>
Appropriate Technologies in W&S	technical		
Water Decade	policy		
Participation and Animation	social		
Sanitation and Health	sanitation/technical/education		
Operation and Maintenance	institutional/economic		
Monitoring and Evaluation	methodology/holistic		
Sustainability of Drinking Water Supply & Sanitation Projects	holistic view		
Communication in Development Cooperation	social / methodological		
Water & Sanitation Knowledge System	skill and know-how		
Water is not a free resource (anymore) Who pays?	economy	Werner Fuchs	1993
Sustainable W&S projects through fair negotiations	institutional / social	Werner Fuchs	1994
Urban Sanitation: A challenge for communities, private enterprises, local governments, and external support agencies	institutional / economy	Peter Schübeler	1995
Transfer of Ownership in Water Supply & Sanitation Systems	social / institutional	Peter Schübeler	1996
Less Water for More People	institutional / economic / social	Bruno Strelbel	1997
New Technologies and Balanced Development	technology / economic institutional	Stephan Niederer	1998
Private Sector - just a (new) hope?	institutional / social / skill + know how incl. rules + regulations	Urs Fröhlich	1999
The Household-centred Approach	institutional - planning	Adrian Coad	2000

## Annex 13 – Topics suggested for the next Aguasan Workshop

Towards the end of the Workshop, participants were asked to suggest topics for a subsequent Aguasan Workshop. The following suggestions were made. They are grouped roughly in subject areas, but there is no significance in the order.

- ◆ Innovative water resources management
- ◆ (Urban) integrated water resources management
- ◆ Water as a part of integrated rural development
- ◆ Sanitation as the key for sustainable water supplies
- ◆ Consolidating the sector revolution
- ◆ What is stopping us (from being further ahead?)
- ◆ Making ourselves redundant
- ◆ Paradigm shift No. 2
- ◆ Paradigm shift applied to the next subject
- ◆ The Household-centred Approach – how to do it
- ◆ Truly include the local level
- ◆ Advocacy for synergy among partners
- ◆ Linkages and synergies of approaches for sustainability
- ◆ Water Acts in practice
- ◆ Legal framework
- ◆ Conflict management in the water sector
- ◆ Water as a source of conflicts
- ◆ Economic dimension of water
- ◆ Project or budget support?
- ◆ From supply management to demand management
- ◆ Social marketing
- ◆ Motivation
- ◆ The interface between relief and development work
- ◆ Holistic approach.

## Annex 14 – Some definitions and abbreviations

### Definitions

**Figure/ground reversals** The *figure* is the main focus of attention, the obvious subject. The *ground* is the context or the background, which normally does not receive much attention. *Reversal* means that we give more attention to the ground than to the figure, thereby reversing the normal order of priority.

Franchise	In this connection, a franchise is an agreement that grants an exclusive right to a private sector operator to provide a defined service for a specified period in a specified location, and to collect the fees from the beneficiaries. The franchisee (operator) may be required to pay a periodic fee to the grantor for this privilege.
Holographic	This indicates that information is everywhere. If one part fails another part may take over.
Lateral thinking	Moving sideways when working on a problem to try different perceptions, different concepts and different points of entry. The term covers a variety of methods including provocations to get us out of the usual line of thought.
Paradigm (pronounced to rhyme with <i>time</i> )	A way of thinking about or approaching an issue. A statement about the issue that is regarded as reliable and that is linked to an action to, or attitude about, the issue.
Paradigm shift	A change from one way of thinking to another

### Abbreviations

CAP	Community Action Programme, an NGO working in Faisalabad, Pakistan.
DRWS	Department of Rural Water Supplies, Lesotho
O&M	operation and maintenance
VDC	Village Development Council (responsible for several villages) Lesotho
VWC	Village Water Committee (one for each village) Lesotho
WASA	The Water and Sanitation Agency (in this case of Faisalabad, Pakistan)
WMC	Water Management Committee (managing water supply for a Cameroon village.)