

Blekinge Institute of Technology  
Dissertation Series No 2002:06  
ISSN 1650-2159  
ISBN 91-7295-017-X

# **Feminist Sanitary Engineering as a Participatory Alternative in South Africa and Sweden**

BIRGITTA RYDHAGEN



Department of Human Work Science and Media Technology  
Division of Technoscience Studies  
Blekinge Institute of Technology  
Sweden

## BLEKINGE INSTITUTE OF TECHNOLOGY

Blekinge Institute of Technology, situated on the southeast coast of Sweden, started in 1989 and in 1999 gained the right to run PhD programmes in technology.

Research programmes have been started in the following areas:

- Human work science with focus on IT
- Computer science
- Computer systems technology
- Design and digital media
- **Technoscience Studies**
- Software engineering
- Telecommunications
- Applied signal processing

Research studies are carried out in all faculties and about a third of the annual budget is dedicated to research.

Blekinge Institute of Technology  
S-371 79 Karlskrona, Sweden  
<http://www.bth.se>

Jacket illustration: Birgitta Rydhagen

Photos: Swedish dry latrine: *Johanna Alkan Olsson*, Manneken-Pis in Brussels, Belgium: *Magnus Hammar*, Bucket latrine in Vioolsdrif, South Africa: *Birgitta Rydhagen*, Vacuum toilet at Tegelviken School, Sweden: *Birgitta Rydhagen*, Swedish road sign: from [www.skyltar.se](http://www.skyltar.se), Fideicommissum by Ann-Sofie Sidén: *Anders Norrsell* (with permission from The Wanås Foundation, Sweden), Laotian toilet: *Boel Nyberg*, Botswanan toilet: *Magnus Hammar*, Chinese toilet: *Susanne Karlsson*.

© 2002 Birgitta Rydhagen

Department of Work Science and Media Technology, Division of Technoscience Studies

Publisher: Blekinge Institute of Technology

Printed by Kaserntryckeriet, Karlskrona, Sweden 2002

ISBN 91-7295-017-X

Feminist Sanitary Engineering as a  
Participatory Alternative in  
South Africa and Sweden

Birgitta Rydhagen



*We must cast our lot with  
some ways of life on this planet,  
and not with other ways.*

*(Donna Haraway, 1997)*

## ABSTRACT

The main theme in this thesis is potentials for increased user participation in the development of ecological sanitation technologies. The argument is that ecological sanitary engineering can be regarded as a heterogeneous practice that needs to incorporate environmental considerations as well as users' knowledges and aspirations. To be a heterogeneous engineer therefore means to acquire skills for advanced dialogue with the users and other stakeholders, rather than providing finished technical solutions.

In a case study in rural South Africa, I found that much of the responsibility for taking initiatives for the transformation of the water supply and sanitation systems lies with the community. By contrast, a case study of ecological sanitation in urban Sweden revealed that there was generally very little room for user involvement; instead, sanitation specialists presented a picture of the users as recipients of technical systems and information. These two different cases form the basis for a discussion about the relationship between users and specialists and pose the question of how we can encourage participatory technology development practices that users, specialists and ecosystems can endure.

On the basis of feminist theory, technoscience and participatory methodologies, I have identified some criteria for feminist sanitary engineering. These include *recognition of diversity*, *feminism beyond gender/deep feminism*, *reflectivity and heterogeneous engineering*, and *action research and user participation*. The transformation of sanitary engineering towards the inclusion of these criteria is a long-term process, which needs to begin with reflection among sanitation specialists.

## ACKNOWLEDGEMENTS

This work was shaped by disciplinary heterogeneity and the fact that I have had continuous working relations at three different universities. I have had my main basis at the Division of Gender and Technology at Luleå University of Technology, which has functioned as a refuge for a collective attempt to develop feminist technoscience. My daily work was conducted at the Tema Institute at Linköping, and I appreciate the hospitality at Tema Vatten. I am very grateful for the opportunity to present my thesis at the Division of Technoscience Studies at Blekinge Institute of Technology.

Lena Trojer has been my supervisor, my mentor, and a very good friend. Lena not only helped me whenever I needed to discuss my research – she has been generous and attentive to me and my family in an unforgettable way.

Sara Alander, Annika Forssén, Elisabeth Gulbrandsen and Christina Mörtberg have played an important role in my research process, and I hope we will find new academic camping grounds where we can continue to meet.

At crucial points in time, I have received decisive support; from Jonas Anselm and Johan Hedrén at the beginning of my research, from Jan-Olof Drangert in the introduction to both empirical areas, and Henriette Söderberg in the turn to the study of engineers, as well as in the final writing process.

I have received much support, and had interesting discussions (and a lot of fun!) with Johanna Alkan Olsson, Christina Björkman, Carin Dackman, Camilla Hermansson, Karolina Isaksson, Sylvia Karlsson, Sofie Storbjörk, Rian Titus, Milicent Williams and May-Britt Öhman. Your work and friendship have inspired me to continue with research. During different periods of my research, I have also enjoyed the intellectual and social company of Mariana Beukes, Anna Blomqvist, Anna Bratt, Peter Ekdahl, Pirjo Elovaraa, Jonas Hallström, Susanne Jonsson, Susanne Karlsson, Björn-Ola Linnér, Malin Mobjörk, Karin Perman, Åsa Sjöblom, Maria Udén and Julie Wilk.

In the two projects, I want to express my gratitude towards the participants in the interviews. I also want to thank Louis Pieters, Denfred Vries and Jolene Liebenberg for their hospitality, and Ulf Jeppsson, Daniel Hellström, Christopher Grubberger, Andras Baky, Linda Malmén, Ola Palm, Helena Palmqvist for interesting cooperation.

I would not have reached this far without technical and administrative support from Ian Dickson, Dagny Granlund, Anita Kero and Annika Lindberg. Jenny Gillot did an excellent work to improve my English. Thank you.

The research was financed by Sida/SAREC (Swedish International Development Cooperation Agency/Department for Research Cooperation), a travel grant from Nordiska Afrikainstitutet (Nordic Africa Institute), FORMAS (the Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning) and VA-FORSK (the Swedish Water & Wastewater Association Research Department), which is gratefully acknowledged.

If I had not maintained my social network, the thesis might have been finished earlier. Maria and Fredrik Carling, Ann and Stefan Holmlid, Members of the choir Motvalls, Boel Nyberg, Anna Svensson, Elisabeth and Bert Rydhagen, Maria, Bruno and Alice Rydhagen, and, of course, Magnus and Tombi Hammar; thank you for taking my time!

This thesis is based on the following five papers:

- 1 Rydhagen, Birgitta (1999) "Feminist diversity - A meeting between North and South", manuscript.
- 2 Rydhagen, Birgitta (1999) "Situated practices. Feminist engineering research methods", presented at the conference *U-landsforskning 2000: Från forskning om u-land till forskning om världen*, Gothenburg University, Sweden, 13-15 January, 2000.
- 3 Rydhagen, Birgitta (2002) "Feminist sanitary engineering in Vioolsdrif, South Africa", *Gender, Technology and Development* Vol. 6, No. 2, pp. 249-267.
- 4 Rydhagen, Birgitta (2002) "Towards heterogeneous sanitary engineering", accepted for publication in *The Journal for Transdisciplinary Environmental Studies*.
- 5 Rydhagen, Birgitta (2001) "Participatory practices in South Africa and Sweden", presented at the conference *Information Technology, Transnational Democracy and Gender*, Ronneby, Sweden, 16-18 November, 2001.



# CONTENTS

<b>LOCATION</b>	<b>11</b>
<b>INTRODUCTION</b>	<b>13</b>
A patchwork text is introduced	13
<b>RESEARCH QUESTIONS</b>	<b>16</b>
<b>THEORETICAL MAP</b>	<b>17</b>
Geographical and political categorizations	17
Gender and technology	17
AALA feminism	18
Feminist technoscience	19
Concepts of knowledges	21
Heterogeneous engineering	22
<b>METHODOLOGICAL AND PHYSICAL TRAVELS</b>	<b>25</b>
Introducing PRA	25
Participatory attempts in Vioolsdrif, South Africa	26
Water and sanitation in Vioolsdrif, South Africa	30
Modest intervention in ecological sanitation in Sweden	31
Ecological sanitation in Sweden	34
<b>EXPERIENCES OF USER PARTICIPATION</b>	<b>38</b>
User participation in the two case studies	38
What are the problems with participation?	39
What are the potentials?	41
<b>FINAL REFLECTIONS ON USER PARTICIPATION AND FEMINIST ENGINEERING</b>	<b>43</b>
<b>REFERENCES</b>	<b>46</b>
<b>APPENDIX 1: USER PERSPECTIVES ON ECOLOGICAL SANITATION TECHNOLOGIES IN SWEDEN</b>	<b>51</b>

<b>PAPER 1. FEMINIST DIVERSITY - A MEETING BETWEEN NORTH AND SOUTH</b>	<b>63</b>
<b>PAPER 2. SITUATED PRACTICES. FEMINIST ENGINEERING RESEARCH METHODS</b>	<b>81</b>
<b>PAPER 3. FEMINIST SANITARY ENGINEERING IN VIOOLSDRIF, SOUTH AFRICA</b>	<b>97</b>
<b>PAPER 4. TOWARDS HETEROGENEOUS SANITARY ENGINEERING</b>	<b>115-126</b>
<b>PAPER 5. PARTICIPATORY PRACTICES IN SOUTH AFRICA AND SWEDEN</b>	<b>129</b>

## LOCATION

Nomadism, when applied to the academic lifestyle, relates to the idea that the crossing of borders makes the borders visible and challenges their existence. Braidotti (1994) has identified a number of good reasons for living as a nomad in academic life. However, discussions with my colleagues at the Division of Gender and Technology revealed that we were unsure about some core ideas in the metaphor. Does not nomadism require a collective identity? Can a single person be a nomad, without becoming an hermit? Do nomads leave traces, or is their presence invisible after departure? Is it desirable to move around in society without leaving traces?

In Namaqualand, where I did part of my research, the Coloured inhabitants (whose ancestors inhabited the area some 2000 years ago) were semi-nomads. They travelled with their cattle, but returned to specific spots where water and grazing were known to be available. With time, some people became more domiciled, while the stock keepers continued to travel to fields in the vicinity with the cattle (Archer and Meer, 1997). This kind of nomadism might represent a more honest and desirable way to try to put transdisciplinarity into practice in Academia. As an individual, I can move around with my stock, return home to my kin, marry into another clan and move there, while continuing to move around and find new land with fresh grass and water.

At least, this is what I have been doing for the past six years. As a young adult, I moved to the clan of environmental engineering, where I found many kinfolk and felt comfortable. However, a university education requires that you move on after a period of time, so I picked up my baggage and moved into feminist research. Note that I did not leave all my stuff at the engineering department; rather I brought it with me in the hope that it would fit in my new home.

From my new home in the field of feminist technoscience<sup>1</sup>, I have travelled to a number of different waterholes for inspiration. My first stop was at the post-graduate programme Nature-Technology-Society at Linköping University, where I learnt to read critically and discuss academic literature. This was my first serious encounter with environmental ethics, history of science and technology, environmental sociology and science and technology studies (STS). Another stop was at the University of Agriculture in Uppsala, where I went to learn about participatory research methods. On several occasions, I also spent some time in the field of feminist literature from Africa, Asia and Latin America (AALA). At the University of Western Cape and in the project group of Swedish sanitation specialists that I worked with, I participated as a person in charge of “the social issues” in interdisciplinary research groups with a focus on environmental and natural sciences. Towards the end of my doctoral studies, I came across action research in educational research at Luleå University of Technology.

---

<sup>1</sup> Technoscience indicates the implosion of technology and science, as well as nature and society, subjects and objects, and the natural and the artificial (Haraway, 1997, p. 3; see also Mörtberg, 2000 and Trojer, 2002).

Did I leave traces? I think I did in some places. In others, I hope that I eventually will. I did not stay long enough in some places to make a mark. At home, I think that the souvenirs I brought back with me have inspired the discussions and contributed to the development of what we think of as feminist technoscience studies and feminist engineering.

## INTRODUCTION

This research is about ecological sanitation. I chose this subject because I think the way we handle nutrients in society is important for the environment on the regional level. I am an environmental engineer, and I am concerned with environmental issues related to modern sanitation practices. In rural South Africa, the major issue in sanitation is introduction of a hygienic and affordable latrine system to reduce health risks. This must be done without posing new risks of groundwater contamination. In Sweden, nutrient leakage from sewage treatment plants has caused eutrophication, and alternative ways of handling sewage are being tried. Globally, phosphorus is a limited resource, and recovering it from sewage would reduce the pressure on virgin phosphorus sources. The recycling of the nutrients in sewage would also reduce the more general dependence on the chemical industry, at the same time as it alleviates many of the problems of sewage sludge handling and nutrient leakage and pollution. This is my starting point as an environmental engineer.

In the field of water and sanitation in/for development, there is an awareness of social issues, and gender in particular (see e.g. SIDA, 1994 and FINNIDA, 1994). My study of ecological sanitation is anchored in feminist theory debating feminism in Africa, Asia and Latin America as well as feminist technoscience. Feminist theory contributes to the understanding of technologies as well as knowledge as situated practice and calls for a more accountable engineering practice.

As Faulker (2000) warns, we cannot wait for the engineering practice to consider feminist demands, but need to act as users of technologies as well. However, it is my ambition to develop some ways of thinking of feminist sanitary engineering, which might eventually transform engineering practice.

To me, accountability implies the inclusion of wider groups of stakeholders or actors into the context of technology development (or, as is argued by Nowotny et al., 2001, to move science and technology development into the context of application). This means participatory approaches within the engineering practice as well as in a research project. I am convinced that sustainability, whether we consider it an environmental or more general term, requires citizen involvement in decision making as well as practices. My research project has developed gradually from attempts to perform participatory or action research among users of sanitation technologies, to a modest intervention among sanitation colleagues to plant the idea of user participation among the specialists.

### A PATCHWORK TEXT IS INTRODUCED

The format of the thesis is a cover paper accompanied by a number of independent papers. The cover paper tells the story of my physical and methodological travels as a doctoral student. It presents the main ideas in the different papers, along with an overarching discussion. At first, I thought of my methodological travels as a map, which I could use to pursue my physical travels. However, after a while it seemed to be the other way around, with the physical travels providing the map, according to which I

can reproduce my mental/conceptual travels. Either way, I find it useful to think of the work as a patchwork text, which is described as a method whereby writers make “a selection of their writing presented within an interpretive reflective framework which brings out and explores the overall theme in relation to the individual pieces of writing” (Scoggins and Winter, 1999, p. 3). Winter et al. (1999) suggest the patchwork text as a way to “express directly a sort of cognitive ‘modesty’ on the part of the author” (p. 66), as stories with definite endings are opened up by the author’s own, more open-ended and exploratory comments on her/his own writing. The different stories are brought together to explore contrasts and similarities, to relate them to other authors’ work, and to consider alternative ways of reasoning. It is my attempt to express cognitive modesty, to reveal my ambiguities honestly, and not claim to make statements of truth but interpretations, although I am aware of the tenacity of positivist thinking.

An important characteristic of the chosen format is that the different papers, written at different moments during the seven-year-long research process, reveal my development as a researcher. The papers appear chronologically after the cover paper, as this order also builds up the line of arguments that I pursue. The selection of my writing (**Papers 1-5**) was done to place focus on the two turns (from South Africa to Sweden and from users to specialists) that I have made in my research. The research into users of ecological sanitation alternatives in Sweden is therefore not presented in a separate paper in the thesis; instead, a summary of the results is presented in Appendix 1. The complete version is available in Swedish in Rydhagen (2002).

The points of departure for my mental/conceptual and methodological travels are presented in **Papers 1** and **2**. The physical travel is represented in the study of water and sanitation in rural South Africa, which I started in 1996, and the study of ecological sanitation in urban Sweden, which I started in 2000. The water and sanitation situation in Violsdrif in rural South Africa is presented in **Paper 3**. The study of specialists discussing users is presented in **Paper 4**. These two papers are thus quite different in character, even though they both represent the empirical parts of my work. In **Paper 5**, I begin the reflection on user participation in technology development as it appeared in the two different empirical experiences.

It was only towards the end of my work that I was introduced to the concept of a patchwork text. The concept appealed to me, as it nicely conceptualizes the idea of a number of different text(ure)s, knit together to create a distinct pattern. In Swedish, the cover paper is called a “coat” (“*kappa*”), which adds another dimension to the patchwork metaphor. The coat will be as colourful as the variety of papers included in the thesis, and the fitting will hopefully be suitable for people interested in the subject of heterogeneous engineering, ecological sanitation or feminist technoscience studies.

One idea behind patchwork texts is that the different stories should be discussed in groups, so that the author can learn how his/her story can be read and understood in different ways and to help cast light on her/his own unconscious intentions with the stories. In my case, this was not done systematically, although my papers have been read by journal referees, colleagues and, of course, my supervisor.

While Winter et al. (1999) emphasize the use of fiction or short stories in an artistic form to do justice to people’s imaginative capacities, my papers are rather conventional academic papers. I do not claim to fulfil all ideas of the patchwork text con-

cept, but the idea has helped me to bring together a metamorphic research material into a discussion of conceptual interest.

When I compare my research plans, my empirical work and my written papers, I find the strongest unifying theme to be the potential of *user participation* in choices and development of sanitation technologies as a central part of *feminist sanitary engineering*. There are two different main patterns of empirical material in the patches. The first comes from rural South Africa, where the transition to democracy in the 1990s created possibilities for improvements in water supply and sanitation, and where the communities have a great responsibility to take initiatives to achieve changes (*RDP*, 1994 and *White Paper*, 1994). The second comes from urban Sweden, where the focus of sanitation policy has gradually shifted away from “taking care of waste” and towards “recycling nutrients” (Söderberg, 1999), and where, consequently, new technologies to take better care of the nutrients are being introduced in residential areas.

In the next chapter, I will briefly introduce my research questions. Thereafter, I present my basis in feminist theory and heterogeneous engineering. The following chapter contains comments on the methodological and practical aspects of my research project. It was neither desirable nor possible to separate methodological and practical aspects, since they developed together to such a large extent. Towards the end, I present my reflections over my experiences of user participation gained during the research in relation to the ideas that I had, the theories that I have used as inspiration and guidance, and the development of the projects that I was involved in. Finally, I try to develop some thoughts about the idea of feminist engineering as a participatory alternative.

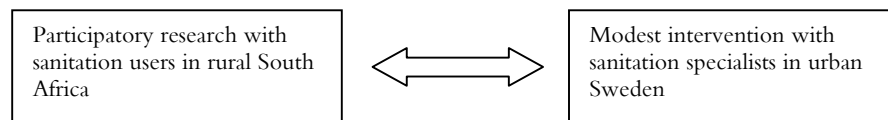
## RESEARCH QUESTIONS

The overall question in my thesis is, to paraphrase Harding's *science question in feminism* (1986), *the engineering question in feminism (TEQF)*, or how can we develop engineering practices that are accountable to the heterogeneous requirements corresponding to the environmental and democratic challenges of our time.

This question is approached in two ways. First, I have identified five areas that are investigated and reflected upon theoretically and empirically:

- What does feminist theory and heterogeneous understandings of knowledges and engineering have to offer in the formulation of TEQF?
- How can participatory and action research methodology be used to address TEQF?
- What kinds of empirical knowledge are needed to investigate TEQF?
- What answers to TEQF lie in the relation between users and sanitation specialists?
- How can feminist sanitary engineering begin to be defined in light of the above questions?

The research includes two different case studies in rural South Africa and in urban Sweden focusing on sanitary engineering (see Figure 1).



**Figure 1.** My physical and mental travels during the research process.

The second way to approach TEQF is to reflect on my development as a researcher. My attempts to integrate feminist technoscience and participatory methodology in order to develop feminist sanitary engineering have evolved through reflections over the different methodological experiences that I had and reflections over the potentials and problems entailed by user participation. Since the reflection process interacted with the development of the two case studies, the methodological reflections are interwoven with the empirical discussion in the cover paper.



## THEORETICAL MAP

### GEOGRAPHICAL AND POLITICAL CATEGORIZATIONS

In the different papers, I have experimented with different ways to refer to certain geographical and political spaces. Being a Swedish person doing research in South Africa, I had to reconsider the well-established concepts of North and South, the West and the Third World, and White and Coloured. I have tried to use the more geographically precise acronyms AALA (Africa, Asia and Latin America; Ogundipe-Leslie, 1994) and ANAE (Australia, North America and Europe), although they still generalize experiences of global hierarchies (see **Paper 1**). The lack of familiarity with these acronyms is the reason why I have not used them throughout all my work. Therefore, I also have a few references to the Third World and the South, the West and the North.

Some researchers and activists argue against the division into geopolitical hemispheres at all. In all countries, there are rich *and* poor people, centre and periphery, people with more power and people with less power, oppressed and ignorant people. In AALA, as well as in ANAE, the diversity is too significant to make such groupings meaningful. The dichotomization that such division enhances, too, is part of the oppressive global structure. I agree that we need to be cautious when generalizing, and that it is more accurate to talk about “sanitation in rural South Africa” than “sanitation in the Third World”. However, I have read enough material from South African water and sanitation projects to realize that even South Africa can be regarded as too diverse to be a meaningful category. For example, gender relations are less oppressive among the coloured people in Namaqualand, where I did my research, than in many other regions. I have tried to avoid unnecessary references to AALA and ANAE, but I have not found it possible to drop these terms completely.

In **Paper 3**, I was discouraged by the journal referees from referring to White and Coloured people (the Coloured people in Namaqualand are principally the descendants of the Nama people) in the South African context. The South Africans that I consulted, who were also my research partners in Cape Town, said that the categories still exist and that they are still called Whites, Coloureds and Blacks. Although I agreed to the changes in **Paper 3**, I still think that we need a language to talk about categorizations that create realities for people, without this meaning that we take them for granted or regard them as neutral terms. If the categorization is made invisible, and if we are expected to read between the lines in research reports, the colour-based inequality in South Africa risks being preserved and continued rather than disappearing.

### GENDER AND TECHNOLOGY

In the development of feminist sanitary engineering, my focus is not primarily on the gender relations in the sanitation sector. I have identified the relationship between engineers/sanitation specialists and the users of sanitation technologies in the process of technological development as the crucial relationship that needs to be problematized

and discussed. This focus relates to the turn from the woman question in science to the science (and engineering) question in feminism (Harding, 1986; see below).

Gender does of course have implications in the sanitation sector. Engineering has remained a (white) male domain until the last few decades, and the use of water and sanitation systems differs between men and women, both in Sweden and in South Africa. The consequences of the male dominance in engineering are not well researched and deserve further attention (Faulkner, 2000).

One of many examples of how gender relations affect the water supply in the user context comes from rural Sukumaland in Tanzania, where the women carried water for household use from distant sources although there was accessible water in the ground near the houses. Drangert (1993, p. 201f) found a strong norm among both women and men in the area, dictating that the development of water sources was the men's responsibility. Since the men were not involved in the water collection on a daily basis, most men avoided digging new wells closer to their homes, arguing that their wives were used to collecting water and that well digging was too laborious. Most of the women found no way to challenge this situation, given their subordinate position, and had to continue carrying water from far away.

Technologies also have an impact on gender relations. Bush (1983) cites the example of the introduction of refrigerators for food preservation in the United States. Refrigerators have meant that the food provision in households has become easier. Previously, much time was spent growing vegetables and rearing cattle, canning and drying the produce, and cooking the food when it was to be consumed. With the arrival of refrigerators and freezers, food can be bought from far away, prepared in advance and preserved for longer. This has had different consequences for women and men. The consequences for rural women were that their role as local food producers diminished, and that subsistence farming and local food production turned into industrial, large-scale farming and the food industry. "Women's traditional roles have been eroded, as their lives have been made easier. (...) Men's roles and responsibilities have been loaded and their opportunities increased, although their work has not necessarily been made easier" (Bush, 1983, p. 167). The same can be said about water supply, where the individual wells have been replaced by piped water supply, shifting the responsibility from women to men (and from private to public).

## AALA FEMINISM

The connections between gender and technologies were central when I first formulated the study of water and sanitation technologies and their interaction with the gender relations in rural South Africa in 1996. The main idea was that gender related needs and practices need to be integrated into the engineering practice, because men and women have different needs, depending on their different areas of responsibility and their access to power and resources in society. I therefore started my research by acquainting myself with some of the feminist theory put forward by authors from Africa, Asia and Latin America (AALA). My reading of AALA feminists is presented in **Paper 1**. The main part of this paper was written in 1997, and I am aware that AALA feminist literature has grown since then. In addition, it is important to underline that AALA feminism is not a monolith, as my categorization might suggest. To me, how-

ever, the categorization was one way to identify feminists that relate to environments that were in some way connected to the focus of my study, namely a group of people whose daily lives are marked by a continuous struggle to find food, water and fuel wood for day-to-day survival. The AALA feminists that I studied also shared experiences of colonialism.

One major experience I gleaned from what I studied at that time is the sheer amount of effort these authors have had to make in order to legitimize their contribution to the feminist debate. Feminist diversity is emphasized repeatedly, and we are reminded that although feminisms share a vision to end gender hierarchies, the feminist movement differs substantially between different places and different groups of women. For women in AALA, Johnsson-Odim argues, “gender discrimination is neither the sole nor perhaps the primary locus of the oppression” (1991, p. 315). Different hierarchies (ethnicity, age, marital status, citizenship, sexual orientation, etc.) interact with gender to produce situations where the struggles for change differ in focus. We cannot identify a common Woman question, which could unite all women against a particular Patriarchy. Neither can we neglect other hierarchies between humans or with nature. From ecofeminism, we can learn that diversity is not a problem but a virtue and that we *can* and *should* worry about people and customs that are different from us and ours (Warren, 1993). Thus, we do not need to homogenize women as a group to legitimize feminism.

Some AALA feminists argue that the poststructuralist/postmodern influences in feminist theory (which are also important in feminist technoscience) reduce the possibilities to strive for a societal change (e.g. Mulinari, 1996). The argument is that postmodernism is relativist, making it impossible to claim that, say, gender equality is “better” than the patriarchal system. It has also been pointed out that in important aspects, modernism has not permeated society to such an extent that postmodernism is relevant in AALA. From my perspective and my reading (see **Paper 1**), it appears that the stress on heterogeneity, fractured realities and situatedness are shared by AALA and postmodern (technoscience) feminists. Haraway (1997), for example, argues that location, not relativism, is the appropriate alternative to the positivist claims of universal truths.

## FEMINIST TECHNOSCIENCE

Shiva (1997) criticizes what she calls “technofeminism”, where, she argues, there is still only room for recognizable, academic/scientific arguments for or against certain aspects of science and technology. I see the point in her argument, but I do not regard it as a reason for leaving technoscience. Rather, I see it as a challenge to me as a feminist engineer to become even more engaged in the transformation of engineering and of my own understandings and visions. The challenge for feminist engineers is to remain in engineering or technoscience without losing contact with the general public and the knowledges that exist outside the community of engineer colleagues. To maintain the contact with the public is also a lesson from the American biology professor Crouch, who realized after a number of years in research that she had lost connection to the public community where she lived, in favour of the globally dispersed community of researcher colleagues (Crouch, 2000).

In order to meet this challenge to feminist engineering, we need to address the basic principles and not limit ourselves to the gender question in engineering. Harding (1986, p. 21) questions whether feminism should “set such a low goal as mere equality with men” (p. 21). Gulbrandsen (1995) asks why we, as feminists, should restrict ourselves to the political question of gender equality when there are so many other political questions that require attention and where our feminist experiences matter? Bush (1983) concludes that feminism has taught us that individual solutions to collective problems are not possible, and, in my view, for the feminist movement this means including issues other than gender problems and striving for something more than personal/individual liberation. In response to my parallel readings of AALA and technoscience feminists, I believe that deep feminism, which addresses oppression and hierarchical structures as such, is required when we engage in feminist technoscience studies (see **Paper 1**). Deep feminism was inspired by *deep ecology* (Næss, 1981), which relates the (desirable) long-term solutions to environmental problems to democracy, distribution of resources and the recognition of diversity and symbiosis. In the same way, the struggle to do away with gender hierarchies and other hierarchical structures is deeply connected to democracy, resources, diversity and environmental issues, and these need to be addressed in multiple ways. These issues also need to be addressed in a constructive way, presenting alternative visions and future possibilities.

One consequence of these complex understandings of feminist challenges is that gender relations may not be discussed explicitly in a feminist technoscientific text. In 1986, Harding formulated the science question in feminism thus: “Is it possible to use for emancipatory ends sciences that are apparently so intimately involved in Western, bourgeois, and masculine projects?” (1986, p. 9). According to Gulbrandsen and Trojer (1996), feminist technoscience studies require a shift *away from* a focus on women and gender in technoscience and *towards* the theoretical and methodological foundations of the disciplines within technoscience. The feminist problematization of the foundations of science and the recognition of our accountability can influence the way in which analysis is done within any technoscientific research project.

The necessity of involvement in the context of technological development as well as in the context of use is connected to the large-scale introduction of very complex technologies that have consequences for the sustenance of life on our planet. Many of the new technologies can only be tested in “real life” (e.g. test-tube babies and genetically modified crops), and hence, we are being turned into full-scale test laboratories (Mörtberg, 2000). An important aspect of feminist technoscience is therefore the emphasis on accountability in research. Scientific knowledge produces reality, which I as a knowledge producer must be aware of my responsibility for (Gulbrandsen, 1995). This calls for reflection on and consciousness of oneself and one’s role in the production of knowledge (see e.g. Haraway, 1997). In my attempts to do participatory research, I made a conscious decision to focus on ecological sanitation because I see the advantages that these technologies have, and my aim was to contribute to the growing knowledge about how they work and do not work with the users.

In a study with feminist natural scientists, Kerr (1998) identified a number of different issues that the practitioners emphasized as feminist in their practice. Diversity was a major issue for the scientists, both among researchers and in research perspectives, practices and theories. The feminist scientists also emphasized the importance of broader connections, both with the local community and in interdisciplinary groups of

colleagues, and the recognition of uncertainty. These issues do not raise gender relations explicitly, but relate instead to the feminist problematization of the foundations of science and of situated knowledges that are theorized by e.g. Haraway and Harding. Kerr concludes that (feminist) experiences in social sciences cannot simply be transferred to natural sciences. I interpret her argument as claiming that instead we (natural scientists and technoscientists) need to develop our own understandings of how feminism makes sense in our practice.

## CONCEPTS OF KNOWLEDGES

The situatedness of scientific knowledge has been acknowledged from different fields of research, including feminist and development studies. To make sense of my ideas about user participation and participatory research methods, I will present a few perspectives on knowledges that have been relevant for my study.

“Local” or “traditional” knowledges are often recognized in development studies. Chambers (1997) makes a distinction between scientific knowledge, which draws general conclusions from several different cases and which is good at very big and very small things, and local knowledge, which is good at the local level and things that are observable by the eye. From a participatory development perspective, he argues that until now we have paid far too much attention to scientific knowledge and neglected the importance of local knowledge, especially in development projects, with the ensuing failure to reshape social inequalities or even meet the practical needs as intended. Although Chambers (1997) emphasizes local knowledge, I find the demarcation between local and scientific problematic.

Shiva (1993a and b) problematizes the supposed universality of scientific knowledge. As a Third World researcher and activist<sup>2</sup>, she regards the hegemony of Western science as an aspect of colonization. The definition of science and scientific knowledge is, according to her, a circular argument, as it is identified by the scientists themselves. Shiva is one of the persons who promotes and makes visible local science that is spread orally between generations in rural Asia and that is developed in cooperation with biological processes to sustain the ecosystems in which the people live and work.

A radical approach towards knowledge is Haraway’s idea of situated knowledges. With her argument that all knowledge production is partial, the distinction between scientific and local knowledge is dissolved. Shiva and Haraway, both argue that scientific knowledge is *also* local or situated, just as other forms of knowledges are, and that the problem with science starts, in a way, when we fail to recognize this foundation. The experiences shared by sheep farmers in Great Britain after the Chernobyl disaster exemplifies this clearly (Wynne, 1989). The radioactive contamination of the pastureland was registered, but the scientists assured us that the contamination would not affect the sheep or the farmers. Their recommendations were unreflectingly based on studies of radioactive caesium in other geological and vegetal conditions; however, the actual conditions in the areas in question proved to have a completely different pattern of

---

<sup>2</sup> As a comment to the discussion about geographical categories above, Shiva uses Third World very consciously to make visible the non-universality of what we often see as universal (Shiva, 1993a).

transport of caesium. At first, when it was realized that the contamination did affect the sheep (contrary to the referred studies), and that radioactivity was not decreasing, the experts advised the farmers to move the sheep. They were also recommended to feed them with imported straw and to keep them rather than sell them, despite the lack of pastureland and imported straw. The scientists' failure to consider the local conditions and their lack of recognition of the complex context caused severe suffering among the farmers.

According to Haraway (1997), situatedness forces the knowledge producer to be accountable for her/his knowledge and to "cast our lot with some ways of life on this planet, and not with other ways" (p. 51). In this way, the worry that "anything goes" if we admit that there is no Truth is disqualified. Instead, every claim of knowledge must be motivated for what ways of life it supports.

Accountability and situatedness presume demystification (Schön, 1995, p. 287f) of science to enable continuous transgression between science and society. Nowotny et al. (2001; see also Gibbons et al., 1994) claim that this kind of "Mode-2" science has already started to develop. In Mode-2, science is generated in the context of application, not apart from it, and this fosters distributed production of knowledge. An example of a Mode-2-interpretation of knowledge could be Corell's (1999) study of the negotiations within the UN Convention to Combat Desertification, where she found that expertise was not only, or even mainly, related to the scientific board. Rather, the NGOs (non-governmental organizations) representing the Sahel inhabitants with a situated and local knowledge were able to act as "knowledge providers active in the expertise zone" (p. 201). Corell, thus, argues that expertise is not restricted to scientists, but to those whose knowledge is required in the specific case.

If we regard knowledges from different sources (including scientific) as situated and partial, relevant knowledges can be brought together on the same critical plane (Smith, 1987) to form meaning in a specific situation. With this approach, engineering becomes a heterogeneous practice.

## **HETEROGENEOUS ENGINEERING**

The idea of heterogeneous engineering is introduced in Law's (1987) text about the Portuguese effort to establish control over the Indian Ocean in the 1400s. Heterogeneous engineering suggests that the stability of a technological system or artefact is "a function of the interaction of heterogeneous elements as these are shaped and assimilated into a network" (ibid., p. 113). The heterogeneous elements include social as well as natural, economic and technical factors.

In the argumentation for reflective practice among professionals, Schön (1995) analyzes the possibilities for the engineer to handle the heterogeneous elements. Either, the engineer may choose to "deal with these messy factors by placing them beyond the boundaries of his professional life" or "he may accept the intrusions of the larger situation as a part of his legitimate professional concern, opening himself to complexity, instability, and uncertainty" (p. 188).

The emphasis on heterogeneity and reflection-in-action seems relevant in the case of ecological sanitation, where environmental conditions as well as consequences need to be brought into negotiations together with users' preferences, the financial

situation and the infrastructure presently in place. The two concepts have helped me in my argumentation for an engineering practice that is aware of the social aspects, prerequisites and consequences of engineers' work, not only as something that "obstruct the efforts to introduce ecological sanitation alternatives"<sup>3</sup>. At the same time, heterogeneity is a reminder that the environmental consequences cannot be neglected.

User participation and local knowledge have been attended to in development discourse in recent years. The difficulties of successful/unproblematic technology development and use have become apparent when technologies have travelled from Europe to Africa, Asia or Latin America (AALA). As Gulbrandsen argues, it is not sufficient to claim that science works, because it often does. "We must also be able to specify what science works at" (Gulbrandsen, 1995, p. 9 in Paper IX; see also Keller, 1992, p. 73f). In an example from India (Shiva, 1993a), "scientific forestry" (fast-growing Eucalyptus) has produced a lot of timber, and in addition, salinization of the soil, water scarcity, reduced soil fertility and micronutrient deficiency, but no fruits, no manure and no fuelwood for the local population.

The heterogeneous engineer (as Law argues all engineers are, whether we acknowledge it or not) is not analytically privileged, but should be scrutinized in the same way as other actors (i.e. users, politicians, protest groups, nature, other artefacts and technologies in use). This relates back to the discussion about situated knowledges above, claiming that expert knowledge is located in the same way as other knowledges. It also has consequences for the specialists, whose statements or recommendations are often given priority in relation to other actors' interests. While we have been used to regarding the specialists as authorities whom non-specialists are supposed to trust without questioning, Schön (1995) proposes a dialogic relationship between the reflective specialist and the "client"<sup>4</sup>. The reflective specialist should be open about complexity and uncertainty and enter into a dialogue with the "client" about the meanings of this. This will place new requirements on the "client" as well: they will have to learn to handle the knowledge about the specialists' limits and to judge the recommendations in light of their dialogue about this. This process is difficult and time consuming for the specialist as well as the "client". However, recognition of the situatedness and limitations of specialists' knowledges, as well as of the value of others' situated knowledges, could contribute to a more complex and foresighted technological development.

In my own research, I try not to distinguish between actors, expertise or knowledges of different kinds. Those of us who have specific knowledge of sanitation technologies are referred to as sanitation specialists<sup>5</sup>. To me as a sanitation specialist, the sewage treatment plant is not a black box, where dirty water goes in and clean(er) water + sludge comes out. I know how phosphorus is removed and incorporated in the sludge, and I know that nitrogen leaks out with the "clean" water, together with residues of medicines and other potentially toxic substances. When we talk about the problems with the sanitation systems, we need specialists to open the black box to

---

<sup>3</sup> This formulation (my translation) is taken from an e-mail from Mats Johansson at the consulting firm VERNA about a conference on Ecological Sanitation (Avlopp och Kretslopp) that was to be held in Linköping, Sweden, 18-19 March 2002.

<sup>4</sup> Schön uses the terms professional and client, while I refer to specialists and users in my work.

<sup>5</sup> Some, but not all, are engineers. Especially within ecological sanitation, other knowledges are required in addition to engineering; hence the more inclusive reference to specialists.

specify the problems and what we can do about them without creating new problems elsewhere. To be able to handle external consequences, we also need other experts who have specialized in farming techniques, in the microbiological processes in the soil where the nutrients from the sewage are needed, etc. In line with Corell's definitions of expertise (1999; see above), I argue that also the users of the technology provide relevant knowledge, situated in the household and the use of a sanitation system on a daily basis.



## METHODOLOGICAL AND PHYSICAL TRAVELS

In this chapter, I will present the methodological and empirical aspects of my research. The methodological reflections forming each of the two studies introduce each study, and hence, methodology and practice are sandwiched.

### INTRODUCING PRA

As an engineer engaged in feminist research, I have had the freedom to find my own way to define research questions and identify methods suitable for gathering and analyzing relevant material. I decided to interact with users in order to explore user participation in the development of sanitation technologies. I wanted to use participatory research methods and work together with the group of users in question, and I wanted to find ways to involve users as participants in technology development.

In **Paper 2**, a number of *feminist dilemmas in fieldwork* (Wolf, 1996) are raised. These dilemmas include the conflict between fulfilling academic requirements concerning individual authorship of texts, which must be written in English within a certain time frame, and the vision of collective work in a context where texts are useless and English is not spoken. The power relations between the researcher and the research participants are also discussed in Wolf (ibid.) – both in the field situation, where the researcher defines the agenda, and in the writing process, when the participants are left behind and represented in written form. Several of these dilemmas seemed to me to be addressed in participatory research.

In 1996, when I started my research project, I was determined to try participatory research, in the form of PRA (participatory rural appraisal) as a method to learn collectively with the users of technologies in locations where people in general lack influence over the directions of development (e.g. Chambers, 1997). In Maguire's words: "the decision, then, to attempt participatory research grows out of a deep belief in the ability of people, ourselves included, to grow, change, challenge injustice and oppression, and take increasing control of our lives and communities through collective action, however small. Yet we live within the very structures and relationships we seek to transform" (Maguire, 1993, p. 176). My previous (second-hand) knowledge of participatory approaches (inspired by my friends at University, Sundin and Tufvesson, 1995) was that they presented a promising possibility to participate consciously as a researcher in reality production together with a group of people.

PRA as a distinct participatory approach to development practice began to appear in the late 1980s in Kenya and India. Ideas, experiences and tools were taken from participatory action research, applied anthropology, farming systems research and agroecosystem analysis. PRA developed from RRA (rapid rural appraisal) as more long-term processes were required (Chambers, 1997, p. 102f). PRA has gradually spread from rural to urban, to organizations, to policy, and from appraisals to much longer processes and to research. PRA is still in use, along with PLA (participatory learning and action).

PRA, and especially its distinctive tools for knowledge production and action planning, is well known among development practitioners and institutions today, and PRA practitioners are “trying to do better through action more than thinking about theory” (Chambers, 1997, p. 196). However, PRA practitioners like Chambers stress the underlying values as central, while the tools are developed according to the specific situation. “The essence of PRA is changes and reversals – of role, behaviour, relationship and learning. Outsiders do not dominate and lecture; they facilitate, sit down, listen and learn. Outsiders do not transfer technology; they share methods which local people can use for their own appraisal, analysis, planning, action, monitoring and evaluation. Outsiders do not impose their reality; they encourage and enable local people to express their own” (op. cit. 103). Some of the better known tools, in addition to interviews and observation, are:

- “do it yourself” (i.e. participation in ongoing activities)
  - collective production of a map using local material like straw, stones, etc.
  - matrix scoring and ranking of alternatives
  - production of seasonal calendars and daily time-use analysis
  - analysis of difference by gender, social group, wealth, etc.
  - transect walks with local guides to take note of physical conditions
  - visionary drawing
  - drama and video-production
- (op. cit. p. 116f).

In **Paper 2**, similarities and differences between feminist research and PRA methods are examined. My reasons for combining and comparing the two were their shared emphasis on empowerment, situated knowledges and a dialogue on as equal terms as possible. Guijt and Kaul Shah (1998) have gathered a number of texts where the connection between feminist issues and participatory development is further debated. Humble, for example, argues that “gender and development” (GAD) theory, which focuses on women’s empowerment and the complexity of gender relations in different socio-economic contexts, needs a critical, reflexive and participatory methodology to “translate theory into action” (1998, p. 35f). These criteria are, according to Humble, central also in PRA, which makes PRA suitable to raise GAD issues in practice. Crawley (1998) warns that participation does not automatically lead to the empowerment of women, if it does not address gender relations, expressions of difference and conflicts.

In principle, the idea of PRA is simple; people can and should develop their own visions, capacities and projects according to their own priorities on the community level. In practice, several uncertainties and complexities appear.

## **PARTICIPATORY ATTEMPTS IN VIOOLSDRIF, SOUTH AFRICA**

In 1996, I contacted a research group at the University of the Western Cape (UWC) and was invited to participate in their research programme *Groundwater Assessment and*

*Strategy for Western Karoo, Namaqualand and Bushmanland* running from 1996–2001<sup>6</sup>. The group was multidisciplinary, with a focus on natural sciences, but including a socio-economic study. Rian Titus was my contact person at the Department of Earth Sciences, and I worked closely with Milicent Williams, who did the socio-economic study as part of her Masters Degree (see Titus et al., 2002).

The overall aim of the project at UWC was to assess the groundwater sources in the region in order to localize possible sources of water of good quality and sufficient quantity for the population in the three regions. Since water is scarce in the region, the inhabitants' water use habits were also subject to survey and discussion. The final project report was presented to the South African Water Research Commission in 2002 and included a socio-economic study of water supply and sanitation in two communities within two different Coloured Reserves in Namaqualand.

During a visit to South Africa in April 1997, I visited the region of Namaqualand together with Milicent Williams to visit the villages where she had done her study and to identify a location for my study. While the ideal PRA is initiated by the villagers (see **Paper 2**), PRA can also be used, as I planned to do, in research initiated by the researcher. The interest of the village representatives in participating in the project is crucial in outsider-initiated PRA as well. A few villages were suggested by civil servants at the District Office, and after discussions with representatives in these villages, Milicent and I agreed on the village of Vioolsdrif. Apart from the interest expressed by the village leaders, this village was also chosen because it complemented the two villages where Milicent had performed similar interviews and thus would contribute to the larger project at UWC.

In Vioolsdrif, where I returned for three weeks of field studies in October 1997, I was invited to stay in the home of Jolene Liebenberg, who worked at the local Action Council. She and Louis Pieters, chair of the Local Development Forum, looked after me in many ways. They introduced me to some of the community members, where my interview sessions started. They also cared for me when I fell ill after drinking untreated water from the Orange River, and they shared their daily life with me, and their hospitality made me feel very welcome.

However, the fact that I was dependent on two of the leader figures in the village was also problematic. I came to understand that there was distrust between the leadership and some groups in the community, although I did not learn the reasons for the conflict. My affiliation with the leaders affected my work in the village, as I was discouraged from interviewing certain people (some of whom I visited alone later during my stay), and because some of the participants were careful not to criticize the leaders in the interviews. It was also clear that the distrust between the leaders and some of the villagers affected their possibilities to approach District officers and NGOs for support in development issues.

I had been eager to try to use PRA and to involve the people in group work to assess their situation and develop strategies for their future. PRA suggests visual techniques for collective learning in groups (see **Paper 2**), and for my research in Vioolsdrif in South Africa, I had prepared myself with material for this purpose. I tried, for example, to get a group of neighbours to compare different toilet alternatives using

---

<sup>6</sup> The research group consisted of Kevin Pietersen, Rian Titus, Shafick Adams, Ronelle Buis and Milicent Williams.

matrix ranking (this resulted in a list of characteristics, but no ranking). I asked a married couple to list male and female household responsibilities, and we discussed their meanings to the wife and husband (see **Paper 3**). My research partner Mariana Beukes<sup>7</sup> and the youth group in Vioolsdrif produced a diagram showing the relative work done by women and men in different household tasks (see **Paper 2**).

Practical and mental obstacles prevented more extensive PRA activities than these. First, my interpreter fell ill, and I had to rely on my hosts (who were among the powerful in the village) and my own limited knowledge of Afrikaans. The lack of community spirit made me reluctant to introduce group activities, and I did not want to engage the people in activities that would create expectations I was not in a position to meet.



**Figure 2.** Map of South Africa with Namaqualand and Vioolsdrif in the Northern Cape Province (from SPP – Surplus People Project unpublished material).

My experience from fieldwork in Vioolsdrif in Namaqualand was also that the well-known, visual PRA tools for group activities were not (necessarily) the most suitable. In Vioolsdrif, the people did not generally gather in large groups, but were at best willing to gather with a few neighbours for a brief discussion. Getting people to use poster materials, write on the board or draw sketches was not as easy as asking them to talk. Finally, I discovered that it would require more time and networking than I had anticipated to establish a relation of trust and a sense of meaningfulness regarding such activities. It also requires networking with outsiders who are in a position to address decisions concerning activities that need support. I therefore revised my plans, and,

---

<sup>7</sup> Mariana Beukes, who lives in Namaqualand and who is an experienced local development activist, did complementary research in the same village in 1999.

apart from the PRA-inspired activities mentioned above, I focused on conventional interviews on a household level.

During my fieldwork in Vioolsdrif, I interviewed people in individual households about their experiences and desires concerning the water supply and sanitation situation. Mariana Beukes continued the field research in Vioolsdrif, in order to cover areas of question that I had not covered and to put Vioolsdrif in relation to the rest of Namaqualand. I conducted 28 household interviews in October 1997, and Mariana did 17 interviews in October 1999. In addition, we both interviewed the community leaders (of which only one man was the same in 1997 and 1999). The interviews were open-ended, allowing the interview persons to speak freely about water and sanitation. In some cases, the woman in the household was interviewed alone, while in other cases, a married couple participated together. All the interviews were performed in Afrikaans (Jolene assisted me with interpretation during the first few days, after which I continued alone with my limited knowledge of Afrikaans) and were recorded.

Mariana reported her material during a visit to Sweden in 1999. I am convinced that her insights into the local context and language, as an insider, gave her a very different access to the community than I had had, and her comments have added important aspects to the paper<sup>8</sup>. For example, Mariana related the situation in Vioolsdrif to that in other villages in Namaqualand and claimed that the lack of development initiatives among community members and community leaders in Vioolsdrif was exceptional. She stressed that the strong position of women was similar throughout the whole of Namaqualand and that gender relations were not very problematic. I agree with these observations in Vioolsdrif, but was not able to understand it in relation to the larger context of Namaqualand.



*Figure 3. Vioolsdrif, viewed from the upper ledge (1997).*

---

<sup>8</sup> Why, then, is she not a co-writer of the paper? I have to stress that the analysis in the paper is my own, although it relies on Mariana's experiences too. Mariana has proceeded to local activities and politics, while I am stuck in the slow process of academic research.

## WATER AND SANITATION IN VIOOLSDRIF, SOUTH AFRICA

What was meant to be an empowering PRA exercise on water supply and sanitation in Vioolsdrif ended up turning into a rather traditional interview study. The interviews nevertheless gave me insight into the reality in a community like Vioolsdrif, a few years after the first democratic elections and the adoption of the Reconstruction and Development Programme (*RDP*, 1994) in South Africa. These insights are presented in **Paper 3**. The paper is structured with inspiration from Bush's (1983) model for technology assessment. Bush located the development of technology solely in the engineering context and the effects of the new technology in the user, environmental and cultural contexts (see the comments in Morgall, 1991). With reference to the concept of heterogeneous engineering, and in the light of feminist involvement in the technology development context, I modified Bush's model to include heterogeneous contexts within the context of development. After my modification of the model, the technology in question is thus assessed in its development context within the four sub-contexts:

- the engineering context
- the user context
- the environmental context
- the cultural and socio-economic context

I examined the information about the current and future water supply systems and sanitation in Vioolsdrif in my interview material within these different contexts. The context model was used to make the heterogeneity visible and to be able to sort the material in a structured way. The interview material was sorted according to the different contexts, so that comments made on technical aspects were brought into the engineering context etc. Especially in the engineering and environmental contexts, Mariana's and my observations were included in the analysis. The data in each context was then summarized to present the present technologies as well as the wishes and possibilities for the future.

In the engineering context, the attempts in 1995 to improve the water supply were limited to providing unpurified river water in two tanks that were filled daily Monday-Friday. Appropriate solutions, which according to the inhabitants would include purification and supply in yard taps, could probably be installed by local consultants or NGOs in collaboration with Vioolsdrif residents. Most households lacked toilets. The few toilets that were in use were either pit latrines or bucket latrines. Neither type requires sophisticated materials or installations, but rather make use of local accessible material like reed, wood and empty barrels.

In the user context, reliability and convenience were major issues. The present water supply system seemed to be inadequate in these terms, as did the sanitation situation. In most of the households, women, men and children were involved in the tedious work of collecting water from the tanks and emptying bucket latrines where these were used. This contrasted with experiences from other villages in Namaqualand, where the women were primarily responsible for water supply and emptying of latrines (Titus et al., 2002). When I asked about the latrines (in households where they had one), the interviewed women claimed that they had taken the initiative and told their husbands to build it. Mariana agreed with me that the women in Vioolsdrif were rela-

tively well positioned in relation to the men. She argued that in general women in Namaqualand had put the South African gender equality legislation into practice in the past five years.

While development of the water supply requires community action, each household can arrange their own latrine. However, the environmental and cultural/socio-economic contexts include some obstacles in both cases. In the environmental context, the polluted surface water and the brackish groundwater presented obvious constraints to a healthy water supply. The perennial river flow within eyesight is an important resource as well. The rocky ground made excavation for piped water supply and for pit latrines difficult. Human excreta pose threats of ground water pollution regardless of the method of collection (although water flush increases the volume), and in the design of sanitation alternatives, the protection of water sources needs consideration.

Through my interpretation of the different contexts, it appears that the main negotiations over new water supply and sanitation systems will take place in the cultural and socio-economic context, as the turn to democracy in 1994 has paved the way for new dreams and expectations. The inhabitants in Vioolsdrif expressed a desire for yard taps and water-borne sanitation, like their white neighbours have. The desert-like environment was not seen as an argument for dry sanitation solutions. From my environmental engineering point of view, I would have wanted to promote dry solutions, arguing that they would save water and reduce the risks of groundwater pollution. Dry latrines (with urine diversion) would also provide an opportunity for more extensive gardening on a household level. In the socio-economic context, they would reduce the community's dependence on outsider involvement in maintenance and reduce costs. Within the complex situation of inequality, however, I find it extremely difficult as a white outsider to give this advice to the community. Mariana Beukes told of alternatives in other villages in Namaqualand where both water flush toilets and dry latrines were installed, so that either could be used depending on the availability of water, and depending on the time of the day, the physical mobility of the user, etc. The future development of the water and sanitation technologies in Vioolsdrif will take place through collaboration between NGOs and officials on a regional level (Namaqualand) and the Local Development Forum in the village. Mutual trust is therefore required between the different actors and within the village, and this has to be built by the actors themselves. **(Paper 3)**

### **MODEST INTERVENTION IN ECOLOGICAL SANITATION IN SWEDEN**

I have had many opportunities to doubt about my research in South Africa. While I was there, I was warned that the people in Namaqualand were tired of being study objects, and during the interviews, people asked me what I was going to give them in return. They had answered questions about electricity and water before, without seeing any improvements in these services. The researcher's answer is often that "this is a long-term process to gain better understanding", etc. At a gender research conference, McFadden (2000) formulated a sharp critique of European researchers in Africa, questioning researchers who wear "the colour of privilege" and who do "not have to be accountable to anyone for whatever text one produces, because after all they are illit-

erate and very remotely located” (p. 92). I take this critique seriously, and I had had the ambition not only to extract knowledge of the existing infrastructure and social structure, but also to actually take part in some process of technological development. Therefore, my decision to switch from PRA to conventional interview techniques forced me to reconsider my aims and my qualities as a researcher.

One way to resolve dilemmas like those I encountered in my research in South Africa is to carry out research closer to home, where the distance between me as a researcher and the participants is shorter. Another way is to “study up” or “study around” (i.e. do research on people in positions above or on the same level as your own): “As a way to avoid some of the pitfalls mentioned, some have argued for a shifting research agenda – ‘studying up’ – studying those with power and control rather than continuing the almost exclusive focus on the powerless and marginalized” (Wolf, 1996, p. 37). Just as we, as white Western feminists, need to problematize our own position in feminism (e.g. McFadden, 2000), we need more generally to learn more about how people in powerful positions, agenda setters, decision makers, etc. think about themselves and their relation to others. Their respect for and interest in the users is also crucial if user participation is not to be reduced to responsibility without influence.

The idea of “studying up” can take some time to digest. When the original vision was to make visible the situation for marginalized people (as mine was), be it women in a particular situation, or rural people in a low-income country, it takes some reversal in thought to begin studies with men or with staff at local authorities. During my own research with users of ecological sanitation technologies in urban Sweden (see below), however, I became acutely aware of the need to learn more about the sanitation specialists. Examining and digesting the specialists’ conceptualization of the users seemed crucial to the introduction of ecological sanitation and to the involvement of the users in this process.

My ambitions at this stage were more modest, as I had redefined my study from being a participatory action to introducing the idea of user participation among sanitation specialists. Although I did not plan another attempt to try out PRA visual tools in my research, the epistemology of situated knowledges and reduction of power hierarchies in the research situation remained central to my research. Therefore, the arguments in favour of focus group interviews appealed to me. Wilkinson (1998 and 1999) argues that focus group interviews meet the feminist requirement for contextualization, as they present the participants in a social context. The social interaction in the group creates a “process of collective sense-making” (1999, p. 67). Focus groups reduce the researcher’s influence and control over the interview situation, which, according to Wilkinson (*ibid.*), should be regarded as an advantage compared with individual interviews. In the focus group, the participants have a greater opportunity to set the agenda and follow lines of thought brought up in the group.

In a focus group interview, a specific topic is raised and discussed in a small group of people. The group can consist of an existing social group (a family, classmates in a school, neighbours, etc.) or people who did not know each other previously. The topic is introduced to the group via some key questions. This can be combined with stimuli materials like newspaper clippings, photos or recordings. The group is then free to discuss among themselves, although the interviewer can intervene to structure the discussion and raise specific questions – to the degree that s/he feels is appropriate. The



focus on analysis of the interaction within the group distinguishes the focus group interview from other kinds of group interview methods (Barbour and Kitzinger, 1999 and Wibeck, 2000).

The potential for transformation of research practice inherent in focus group interviews combines nicely with Heath's (1997; referred to in **Paper 4**) idea of modest interventions and with action research to improve practice (e.g. Elliott, 1991). Heath (1997) defines modest interventions as "translocal engagements that reveal, perturb, and perhaps transform the constructed boundaries between local situated knowledges" (68). Heath worked as an ethnographer and lab technician at a biochemical laboratory, where the Principal Investigator Sakai studies the mutations that cause Marfan syndrome. Heath's transformation of the constructed boundaries included the arrangement, during a conference, of a workshop between Marfan patients, clinicians treating the most life-threatening manifestations, and the scientists who study the genetic causes and possible gene therapeutic interventions. Sakai, who insisted that she was doing "basic" research and was therefore not responsible for the patients and their wellbeing, admitted that the meeting with patients had changed her way of thinking about her work. Her accountability as a researcher towards the Marfan patients had been elucidated to her in their face-to-face meeting.

While Heath's modest intervention gathered people from different locales, many action researchers aim at bringing about a change of practice through reflection with a group of colleagues (e.g. Barrett, 2001). I was introduced to action research during a doctoral course at Luleå University of Technology in January 2001. According to Bradbury and Reason (2001, p. 449), "we must ask as action researchers how our work calls forth a world worthy of human aspiration", which has a peculiar resemblance to the quotation by Haraway that opened my text. Action research and participatory action research develop in a wide range of research areas, with the common denominator "to improve practice" (Elliot, 1991, p. 49) or "a joint re-construction of reality" (Lincoln, 2001, p. 129). Since action research is also done *by* people (cf. *with* people; Bradbury and Reason, 2001, p. 454) in workplaces, communities, etc., it is not necessarily documented in a way that reaches academic databases. What I learnt about the use of action research with/by groups of professionals in various European and American locations helped me to situate my research outside the development discourse. I was also liberated from the priority of visual tools promoted in PRA (which I did not consider immediately applicable in *Violsdrif*), and I found support for my desire to turn from research with users to research with sanitation specialists.

A modest intervention on my part was to invite my sanitation colleagues to a focus group interview concerning the question of their/our conception of users of sanitation technologies. The interview is reported in **Paper 4**. This single event would require further discussions to change the relations between the specialists and the users, and I would not situate this single event within the definition of action research as a reconstruction of reality. Nevertheless, the participants commented that it was a good and interesting experience, both to experience first-hand what it is like being studied and to see how interview as a research method works as it is being done and after translation into a written text. They appreciated the opportunity to discuss the issue of users more openly and in a more structured way than is common.

Interviewing my colleagues provided an opportunity for me to share the writing with the participants during the writing process. They were invited to comment on a

preliminary version of my account of the interview, and were thus confronted with my analysis of the discussion that took place in the interview. For me, knowing that my colleagues were going to read what I wrote about them, and that we were going to continue to collaborate, added a new perspective to the participatory research process. The process of collective learning was extended, as the participants were involved in the writing process after the “fieldwork”, and this influenced my way of presenting the interview material. The participants remained subjects for a longer period than in the previous interview situations, in Vioolsdrif as well as with Swedish sanitation users, where I had very little contact with the participants after the fieldwork.

### ECOLOGICAL SANITATION IN SWEDEN

In 1999, I was invited to take part in a research project on improved recycling of nutrients through blackwater systems (toilet wastewater) and organic kitchen waste disposers in urban Sweden. The other members of the project group would study the flows of nutrients and pollutants in different separation systems, while my task was to study how the users of the different systems perceived these systems (Jeppsson et al., 2002).

In urban Sweden, the sanitation system has been reintroduced into politics after a century of it being regarded as a merely technical matter (Hallström, 2001). The reason for this is the increased environmental concern, demanding both a reduction of release of nutrients into the environment and an increase in recycling of nutrients to agriculture. Besides the efforts to improve sewage treatment plants, there are a number of houses in Sweden<sup>9</sup>, where urine diversion toilets have been installed as part of a project to evaluate the technology and to take the first steps towards source separation of wastewater for nutrient recycling. In an evaluation of ecological sanitation projects, 20 out of the 25 that were identified had used urine diversion (Haglund et al., 1999). Most of the urine diversion projects are described in technical and user studies. The other alternatives, which I focused on in my study, were water flushed blackwater systems (i.e. combined urine and faeces, separate from other household wastewater) with gravity flow and vacuum transport of the blackwater to separate tanks. Gravity flow blackwater is being tried in Viibyåsen, an area of around 100 households in the municipality of Sollentuna, and there is a recently installed vacuum blackwater system in Tegelviken School (a nine-year compulsory school) in the municipality of Eskilstuna, both of which are in eastern Sweden near Stockholm.

Initially, I considered the possibility of becoming involved in an ongoing project to transform the sanitation system in an existing apartment block. Surprisingly, though, the spread of ecological sanitation systems appeared to have halted after the initial attempts made in the 1980s and 1990s. One reason for this has been the problem of finding farmers who are interested in spreading the urine on their land<sup>10</sup>. Instead, the experiences of people who already live with the systems were given voice through

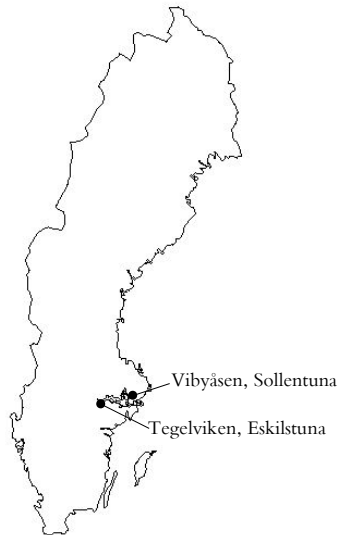
---

<sup>9</sup> This account excludes the ecovillages, where the residents initiate and control the building process of the entire village, as they represent an exception to the main Swedish housing alternatives. There, you will find more examples of urine diversion.

<sup>10</sup> Ulrika Lundahl, Linköping Municipal Environmental Office, personal communication of 13 September 2000.

focus group interviews with a group of residents in Sollentuna (24 April 2001) and with a group of pupils at the school in Eskilstuna (28 February 2001) respectively (see Appendix 1)<sup>11</sup>.

In the reports from urine diversion projects that I have referred to (see the references in Appendix 1), the most common reactions among the residents were that the design caused some problems, including blockage in the urine pipe, insufficient flushing and confusion as to how to get rid of toilet paper after urination. The residents accepted the idea of diversion, but were forced to cope with the technological deficiencies through own efforts or complaints to house caretakers. The gravity flow blackwater system in Vibyåsen had encountered similar problems, with too much water for efficient nutrient recycling but too little for sufficient flushing, resulting in frequent blockages for some residents. The vacuum system in Tegelviken School seemed to have fewer problems with blockages than the other systems. Of course, it is difficult to compare a school with a residential area, and the vacuum system has been expected to be vulnerable to blockages, due to the smaller pipe dimensions. The major drawback with the vacuum system is the noise made by the suction pump.



**Figure 4.** Map over Sweden with the two locations for user interviews indicated.

In the case of Tegelviken School, the entire school was subject to a participatory process of design and functionality (Janzon, 2002). After the decision was made for a new school in 1995, the community members, parents and local organizations were invited to take part in the two-year planning process before and during construction. In Vibyåsen, where a blackwater system was installed, the residents participated in the construction work on their houses, but told me in the focus group interview that they got into a conflict with the building contractor over the sewage system. During the

---

<sup>11</sup> The entire study is presented in Swedish in the VA Forsk report series (see Rydhagen, 2002). Appendix 1 is a translation of the empirical part of the Swedish report.

construction process, the residents discovered that while they were supposed to have urine diversion toilets, there was only one pipe for blackwater. The urine diversion toilets were thus not intended to collect urine separately, but to reduce the amounts of water used for flushing. The residents did not approve of this idea, as the urine diversion toilets were unwieldy to accommodate in the bathrooms. They claimed that they had to use much effort to make their voices heard in the process, as the contractor had already ordered the equipment when the residents were became involved in the process and refused to accept the chosen concept.

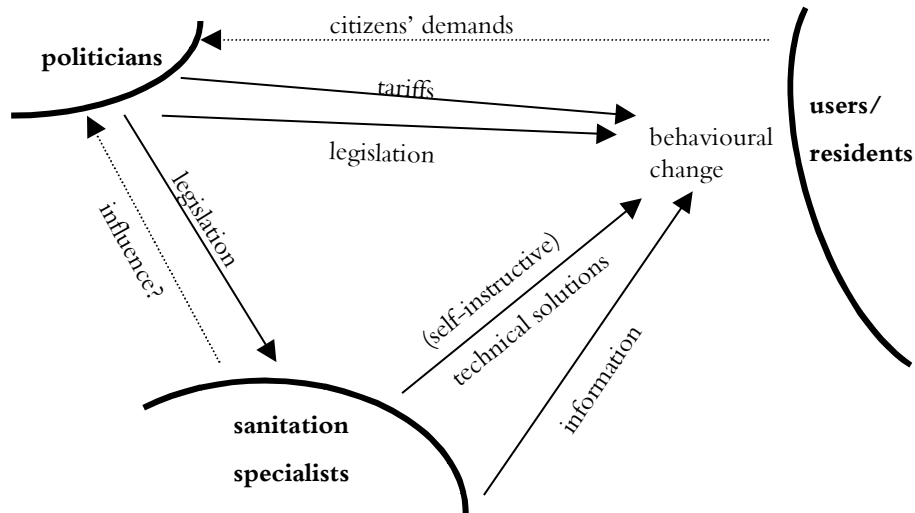
My point here is not to give detailed information about the pros and cons of the different systems, but to give a brief overview of what we learn about users of ecological sanitation. We learn how they cope with the technologies that “befall” them when they move to a new house, or when their landlord decides to renovate the house they live in with respect to environmental concerns. I found that installations were better accepted when they were part of a positive project of renovation or construction of a new residential area, than if they appeared almost to have been installed in secrecy.

With the exception of the school, the findings from the study into users’ conceptions of different sewage systems in urban Sweden indicated that the decision-makers and planners expected the users’ contribution to the development of the systems to be minimal. The users themselves and the specialists regarded the users as receivers of a more or less functional sanitation system, which they (especially in cases of experimental technologies) were sometimes invited to react to through questionnaires or interviews.

Many studies of user perspectives on ecological sanitation alternatives are presented as studies either of attitudes or of behaviours, although they usually cover both these aspects as well as a technical/functional evaluation. When I did a systematic analysis of one of the reports (Widahl et al., 1999), I found that the authors had reported users’ comments on technical functionality more frequently than either behaviours or attitudes. I want to argue that the definitions of what kinds of knowledge users can provide contribute to a view of the users as uninformed and to the mystification of specialist knowledge that discourages users from becoming more actively involved. My experiences from my own user studies and the reading of other people’s reports inspired me to interview my project colleagues in a focus group about their conceptions of users. The members of the project group – four men and three women (including me) – represent research institutes as well as municipal water and wastewater management civil servants, and they/we work on the border between research and implementation of ecological sanitation. Before the interview, I sent a number of questions to the participants, asking about their relations with the users, and their conceptions of the users in relation to their work (see **Paper 4**).

By arranging the transcription of the interview in different ways, I identified five main themes into which the interview could be sorted. These were *Our view of the residents*, *Technology as the solution*, *Possible instruments of control*, *Complexity*, and, in the summing up of the interview, the question of *What we expect from the residents*.

After sorting the discussion into different themes, I identified three groups of actors, and I constructed the participants’ views on *users*, how this affected their own role as *providers* of technologies, and their expectations for *politicians* to set the agenda. The three groups of actors and their influence on each other (according to the interview participants) are represented in Figure 5.



**Figure 5** (taken from **Paper 4**). Actors and their activities in the introduction of ecological sanitation according to my interpretation of the focus group interview with colleague sanitation specialists, 13 March 2001. The arrows represent the ways in which the interview participants suggested that influence is, could be or should be exerted. Continuous lines indicate that the participants identified a rather clear influence, while the dotted lines show where the extent and desirability of the influence was discussed. The “missing arrow”, from users to specialists, represents the relation the interview aimed at bringing up but failed to do.

As the figure demonstrates, the participants had a very clear idea that it is the politicians who should decide goals and design legislation and tariffs to instruct the users in what is desirable behaviour and to inform the specialists what they should focus on. The users were described as possibly slightly interested, but mainly expecting convenient, intuitive sanitation technologies. The role of the specialists was identified as the supplier of the convenient, intuitive technologies, along with well-produced information. It was debated in the group whether specialists should lobby for more radical politics or if their role was to respond to political decisions. The users’ influence on the specialists’ activities was *not* discussed, but was regarded as a more passive consequence of their behaviour (the “missing arrow” in the figure). One of the participants claimed that projects with a technological focus are criticized for not addressing behavioural change or information campaigns, but active user participation was not mentioned.

The interview participants’ construction of the different actors with distinct responsibilities (as I have interpreted it) was in keeping with my expectations after studying previous reports about user perspectives on sanitation. I did notice one difference in the group of specialists, though, as one of the women returned a few times to the point that we are users too, and that our “Western lifestyle” (in this case, the example was using different hair styling products and hair colours which end up in the sewage system) is deeply embedded and difficult to transform.

# EXPERIENCES OF USER PARTICIPATION

## USER PARTICIPATION IN THE TWO CASE STUDIES

Until now, I have mainly discussed the way participatory methodology was tried out as a transformation of the research process. Participation is also, and primarily, suggested as a way to involve users of technologies in development practice. In this chapter, this aspect of participation is discussed in the light of my experiences of research with users in rural South Africa *and* urban Sweden and experiences of research with users *and* sanitation specialists.

As I have pointed out before, initially I had a very positive view of participatory research and technology development. When I encountered the non-existence of participatory approaches in Swedish sanitation projects<sup>12</sup>, I had to reconsider the meaning of participation in different contexts. This reconsideration started with **Paper 5**. This paper is not meant to be a straightforward comparison between the situation in rural South Africa and the situation in urban Sweden; rather, the juxtaposition of the two different cases is used to problematize participation in each of the cases.

In Namaqualand in South Africa, I found that the stakeholders in the participatory process were less well defined than the ideals of PRA suggest. A continuous communication took place between the public authorities, regional NGOs, community leaders and community members. Information about government initiatives was spread in the communities, entailing that their requests for assistance in different matters were guided by their knowledge of governmental priorities. It was nevertheless made clear that the authorities expected initiatives to come from the communities before they would consider providing them with support. In some communities where the LDF (local development forum) was active and well established among the inhabitants, many different activities, including water supply and sanitation, were already up and running (Mariana Beukes, personal communication and Titus et al., 2002).

By contrast, one of my main conclusions from the research in Sweden was that there is no expectation whatsoever of the users of sanitation technologies getting involved, and especially not as a community, in the development of new technologies. Until recently, most of the changes in the sanitation system have been in sewage treatment plants, while the toilets have remained the same for decades, and for this reason there has been no call for the users' engagement – from the users or the specialists.

The questions that these two different situations pose are: why are greater expectations placed on users in South Africa than those in Sweden, and to what extent is participation positive and enduring? The first question suggests that participation might be a way to reduce costs for people who cannot afford to pay for the service. It also implies that the Swedish system is more complex and that Swedish users are less prepared to get involved. This idea is not articulated specifically, as the two contexts

---

<sup>12</sup> Participatory planning is and has been done in other areas of infrastructure in Sweden, see e.g. Malbert, 1998. User participation has also been applied in the development of computer systems (participatory design) and other work-related activities in Sweden, e.g. Bjerknæs and Bratteteig, 1995 and Wagner, 1997.

are rarely related to each other in this way, but it appeared very awkward to me when I began to think of reasons for the different expectations. In what ways could the Swedish system be regarded as more complex? Why would rural South Africans be more interested or have more time to spend? The second question concerns the users as well as sanitation specialists: how much time are users willing to spend, and how much power are specialists willing to hand over? What are the environmental consequences of inviting non-specialists to make decisions about sewage?

### **WHAT ARE THE PROBLEMS WITH PARTICIPATION?**

The proposed questions related to the two different contexts and the problems with participatory methodology that I as well as others have encountered serve as a starting point for a revision of the conditions for participation. In recent years, references to participation as a panacea for “empowerment of the poor” have been subject to substantial critique in a number of books and journals including *The Myth of Community. Gender issues in participatory development* (Guijt and Kaul Shah, 1998) and *Participation: The New Tyranny?* (Cooke and Kothari, 2001).

A major problem that has caused PRA setbacks is the “bad practice” of PRA tools without recognition of the underlying principles, as the vocabulary and tools have been adopted by development institutions ranging from the World Bank to local NGOs and consultants (see e.g. Chambers, 1997 and Francis, 2001). Participation has become a way to reduce costs by using community labour, without allowing the community members to be involved in making major decisions. Empowerment, seen by many as the main goal, has been ignored in many cases.

This problem relates partly to the vague definition of the motives behind the rhetoric. “Participation” is rarely defined specifically and is used for many different purposes, including:

- efficiency in implementation; based on the assumption that participation reduces the need for outside input and improves the final results by increasing the users’ efforts (they contribute with their labour and assume responsibilities)
- education; using participatory methods as a way to spread information and develop knowledge through a group learning process
- improved quality; recognizing that broad participation adds substantial knowledge and experiences that contribute to the results
- democracy; expanding the room for active citizenship
- empowerment; increasing the possibilities for people to control their own lives<sup>13</sup>

In the first three approaches, participation can be regarded as a means to achieve an end, while in the latter two, participation is one of the goals of the activity. The different approaches resemble the way gender has been addressed in development, where efficiency has been a more popular approach than empowerment among the major development cooperation institutions (Moser, 1989).

---

<sup>13</sup> This categorization was made after discussions in a seminar with Henriette Söderberg, programme co-ordinator for the research programme Urban Water, 1 October 2002.

Participation can also be practised in different stages in a project, from involvement in the planning and decision-making process (as in the example of Tegelvik School; Janzon, 2002), to participation in implementation and/or evaluation. The empowering potential is larger in the early stages of a project, when the project is being defined and the resources and responsibilities are being distributed.

The different purposes of participation and involvement of users in different stages can be justified for different reasons, and none of the purposes is inherently invalid. Nevertheless, the reference to specific participatory methodologies like PRA needs to comply with the specific aims of that methodology. Moreover, as Guijt and Kaul Shah (1998, p. 3) observe, the increasing use of PRA to provide technical and management solutions to political issues (efficiency and quality rather than democracy and empowerment) is problematic. In my view, participation should not be used to *avoid* dealing with power structures (diverting focus away from fundamental questions and towards therapeutic activities), nor should participation be used *without recognition* that power relations or hierarchical structures may change (or may need to change). In rural South Africa, where the communities were expected to take the initiative for changes, I found that all five purposes were valid. Previous efforts to improve the water supply have not been appropriated by the community and have been left to decay, as nobody has assumed responsibility for maintenance. Few have apprehended the qualitative differences entailed by the new water sources, as their knowledge of water-related diseases is limited. In the new democratic South Africa, local self-empowerment has also been emphasized (*RDP*, 1994). In the same way, all five purposes could be valid if participation was tried in the development of environmental sanitation systems in urban Sweden, although the education and efficiency aim might be given first priority, if participation is regarded as a means to increase sewage quality.

An abstract ideal of participation, identified on a central level in an organization, may also be lost in the concrete and local phases of a project. Michener (1998) describes how local NGO workers secure their own status by keeping control over plans and resources in a project that was claimed at a central NGO level to be participatory (see also **Paper 5**). In Michener's example, the "participants" (i.e. the local community members) did not appreciate the participatory efforts, as their experience was that they could receive the same benefits from other organizations without having to participate as unpaid labour (which was their perception of the situation). In the case of sanitation, the situation might well be similar, especially if a functioning system is already in place and a change is suggested for environmental reasons. In Vioolsdrif in South Africa, the community members did not gather spontaneously to act on community development issues. Some complained that the District Council did not help them enough, but members of the Local Development Forum as well as officials at the District Council argued that they could do nothing until the community members took part.

Even sincere attempts at empowering participatory projects may fail for a number of reasons. One reason is that the focus on consensus and community activities veils diversity within the community in terms of gender, age, class, household structure, etc. (Guijt and Kaul Shah, 1998). In studies and projects included in *The Myth of Community* (ibid.), it became obvious that it was impossible to achieve the desired consensus regarding decisions and activities, and in many cases this was related to gender. Gendered problems of participation take on many forms, from physical obstacles to participation in public meetings and discussions to more subtle difficulties



in expressing women's gender interests<sup>14</sup> when they are in conflict with men's gender interests. In Vioolsdrif, the village structure was dynamic, due to migration, and the lack of unity made community actions difficult. Furthermore, the gender-differentiated access to participation changed between 1997, when there were targeted efforts to get more women involved in community activities, and 1999, when the opposite was the case.

When outsider specialists are set up against the community as a unit, a false dichotomy is reproduced that most probably benefits the powerful people within the community (Mohan, 2001 and Mosse, 2001). I found in my own research in South Africa that the relationship between the community and the outside world is more complex than PRA implies. As the community has a continuous communication with authorities and NGOs, their internal desires, plans and needs for assistance are adjusted according to what is "acceptable" at that time from a national or regional point of view (**Paper 5**). The community leaders were in a position where they mediated between the community members and the authorities, and hence, their efforts to include differing opinions were crucial to the community members. With the given situation of distrust, it seems unlikely that all community members were able to have their voices heard. In locations where several households are connected to the same water supply or sewage system, it should also be recognized that each user of the system has the power to use the system according to its intended purpose or to use it for other purposes that harm the system. Hence, regarding specialists as powerful and users as powerless obscures important aspects of the interdependence between specialists and users.

Participatory and action research can be criticized for their neglect of larger contexts and power relations and for promoting action/participation without empowerment (see e.g. the discussion in Zeichner, 1993). While participatory or action research can improve a local practice and make people in the group feel more content with their practice, their access to negotiations at a higher level has not necessarily changed. This calls for a recognition of the limits of participatory and action research to address small-scale changes. However, if action research were practised more widely, this would also affect the political situation on a large scale.

### **WHAT ARE THE POTENTIALS?**

In reaction to the critique of participatory activities, Dreyer (2000) suggests that an outsider specialist is better equipped to plan an activity, as long as s/he keeps the benefit of the diverse community in mind. Cooke and Kothari (2001) leave the question unanswered whether the power of participatory activities can be safeguarded from illegitimate or unjust uses (p. 14f).

In my view, some of the arguments against participation seem to be based on the fact that it is not radical enough. If this is because of ignorance of the empowerment aim, it is problematic; however, if it can be explained as a matter of negotiation between dreams and realism, I do not see it as an argument for dropping the idea, but

---

<sup>14</sup> These can be practical, concerning daily duties such as access to water sources and fuel wood, provision of support for gendered sources of income, as well as strategic, concerning access to land ownership, bank accounts and loans, political positions, etc. (Molyneux, 1985).

rather for reflecting better on the outcomes in order to improve practice. Many action research accounts include sincere and structured reflections of development theories and practices, of the kind Cooke and Kothari (2001) would like to see with participatory activities. In the sense of reflection, critical comments are meant to develop rather than undermine the approach.

Given the assumption that everybody is already involved in full-scale pilot tests (of, for example, nuclear power security, use and mix of chemicals, genetically modified crops; Mörtberg, 2000), it is difficult to see any alternative to participation. The question is rather to what extent participation could be better informed and democratically framed.

Potentials for non-repressive participation lie in the recognition of its limitations. As a heterogeneous engineer and researcher, I need to acknowledge that I am part of the problem as well as the solution (Gulbrandsen, 1995), that participation works better in local, small-scale practices than on a larger scale, and that “participation” needs further specification to avoid confusion and unrealistic expectations.

## FINAL REFLECTIONS ON USER PARTICIPATION AND FEMINIST ENGINEERING

I have moved from rural to urban, from South Africa to Sweden, and from users to specialists of sanitation technologies. The direction of the movements has influenced my reflections, as the experiences from Sweden and from my interaction with colleagues were developed on the basis of the experience gained from working with users and in South Africa.

I have also moved back and forth between sanitary engineering, feminist technoscience, development studies, and the arts and social sciences, in attempts to integrate different perspectives and knowledges. As I have moved between engineering and social sciences, I have tended to defend each of them against the other's accusations of ignorance of "important matters". In caricature, many engineers see social and behavioural issues as an obstacle to environmental technologies, while many social scientists blame engineers for the environmental problems we face. Social studies of technology and engineers challenge us, but I think that we, as engineers, have to engage consciously and reflectively in our own activity if it is ever going to change in favour of a more accountable practice (see also Schön, 1995, p. 290 and Haraway, 1997). This thesis is intended as a contribution towards this development.

My attempts to use research to transform practice were not realized to a large extent in the projects I present in this thesis, but the studies that I have undertaken have taught me several important lessons for further and future attempts.

Initially, as I have described earlier, I wanted to do participatory research, and I wanted to focus on my own field of specialization: water and sanitation. In the field, I soon realized that participatory research requires a lot more reflection, time, collegial support and supervision than I had anticipated. I did not wait for initiatives from the participants, but expected to take part in the initiation of activities regarding sanitation in the village where I did my study. The research is still about participation and interaction between users and specialists in the technology development context.

My original plan included a more explicit focus on gender relations than I have expressed in my papers. AALA and technoscience feminist theory as well as experiences in the field made me rethink feminism and develop the thought of deep feminism, where gender relations are not necessarily in the foreground.

I have concentrated on participatory methodology as it has developed in a development context. This has given me some specific advantages and was of course relevant to my study in South Africa. While I am still a white Swedish woman, in the Swedish study I was able to regard a Swedish context in the light of experience gained elsewhere and with another theoretical framework. This has given me a unique perspective on the Swedish context that I would not have achieved otherwise. In particular, this angle made visible a number of elements that I and my colleagues take for granted, both about our own context and about the context of development in South Africa.

While I insist on user participation in the development of sanitation technologies, I must also acknowledge the ambivalence that I share with my colleagues concerning the environmental consequences. Immense efforts are made in water and sanitation offices to reduce pollution, reduce water consumption and increase the possibilities to

recycle the nutrients in the sanitation system. So what happens if we involve the users and they want the “wrong” solution? In rural South Africa, the wish for water flush toilets seems to be highly inappropriate in both environmental and economic terms. In urban Sweden, the convenience of “the same as usual” will probably be at least the initial reaction, especially as long as the alternative systems entail more work. In a conference presentation about the design of water-saving toilets, Jaap Jelsma<sup>15</sup> argued that environmental technologies are different from other technologies, where changes and development have more direct benefits for the users. With regard to environmental technologies, the users cannot be expected to consider and negotiate environmental consequences in relation to convenience and user friendliness or appropriateness. Jelsma therefore talked about the engineers’ desire to “engineer around the user” in order to make it impossible to behave in an environmentally unfriendly manner. In the focus group interview, my colleagues talked in a similar way about developing systems that are simple, intuitive, robust and forgiving.

I do not regard the ambivalence as an argument against participation, but a call to work sincerely with ways to prepare ourselves as specialists to handle possible conflicting interests with respect. In my interview with sanitation specialists, one of the men commented that, “the reason for the difficulties [tackling contamination of the sewage] might be that we do not trust people to use the system properly”. This reflection relates to Schön’s (1995) argument for a new contract between specialists and “clients”, where the specialist is open about alternative judgements and her/his uncertainties and limited knowledge. This will also place new demands on the users to drop a comfortable trust in the specialist and participate responsibly.

Based on the experiences outlined in the thesis, I have identified some criteria for feminist sanitary engineering:

#### *Diversity and location*

Gender relations are diverse, and gender interests differ between different locations. Other social relations related to ethnicity, class, physical capacity, and global relations also affect the priorities and possibilities among users and specialists. Consequently, the developers of sanitary technologies need to acknowledge the context dependence and the differentiated distribution of benefits, changes of habits and drawbacks associated with the technology. Contextualization also presupposes a diversity of relevant knowledges in the process of technological development and an openness to develop different solutions in different locations.

#### *Feminism beyond gender/Deep feminism*

In sanitary engineering, feminist theory provides a challenge for transformation on a deeper level than merely addressing gender (and other social) aspects of the artefacts. In this sense, feminism is an invitation to revise the foundations of scientific knowledge production and to assume accountability for what kinds of technology development one chooses to engage in. The choice made by some sanitation specialists to work with

---

<sup>15</sup> Presentation at the EASST Conference *Responsibility under Uncertainty* held in York, 31 July to 3 August 2002.

environmental alternatives rather than the conventional systems is an example of accountable choices of engagement.

*Reflectivity and heterogeneous engineering*

The recognition of the context embedment of technological development challenges the specialist to become involved in a conversation with the technology users and, in the case of sanitation, with farmers, representatives for the food industry, environmental groups, etc. The specialists need to be open about their own understandings and acknowledge the different meanings that the same technology can have for the other actors. This process requires self-reflection on the part of the specialist in order to reveal his/her personal understandings of the technologies as well as of the users with whom s/he needs to communicate.

*Action research and user participation*

While I suggested that in this research project, I found it useful to shift my focus from studies with users to studies with specialists, this is not an argument against the importance of learning more about and with users. Participatory and action research is well suited to developing self-reflexivity and preparedness for user involvement among specialists. Participatory and action research is also a potential approach when we want to engage the users (and other stakeholders) on an equal basis in technological development. In this sense, action research has a potential to transform research practice as well as the development of technologies.

I realize that the transformation of sanitary engineering practice to comply with these criteria is a very long-term process and that it requires a new kind of citizenship than we have today. As engineers, we need to begin with ourselves and discuss our commitment to heterogeneous technology development processes. We need to discuss what consequences this could have – in environmental terms and on our position as specialists in the social/political structure. We need to unthink standardized technical solutions, and instead integrate the contexts of development and application to allow situated technologies to develop with the users' and specialists' engagement. We also need to accept that this takes time and develops gradually, just as the conventional sewage system has taken a century to develop.

## REFERENCES

- Archer, Fiona and Meer, Shamim** (1997) "Women, tenure and land reform: the case of Namaqualand's Reserves", in Meer Shamim (ed.) *Women, Land and Authority. Perspectives from South Africa*. Braamfontein: National Land Committee, pp. 84-94.
- Barbour, Rosaline and Kitzinger, Jenny** (1999) "Introduction: the challenge and promise of focus groups", in Barbour, Rosaline and Kitzinger, Jenny (eds) *Developing Focus Group Research. Politics, Theory and Practice*. London: SAGE Publications, pp. 1-20.
- Barrett, Penelope** (2001) "The early mothering project: What happened when the words 'Action Research' came to life for a group of midwives", in Reason, Peter and Bradbury, Hilary (eds) *Handbook of Action Research. Participatory Inquiry and Practice*. London: SAGE Publications, pp. 294-300.
- Bjerknes, Gro and Bratteteig, Tone** (1995) "User participation and democracy: A discussion of Scandinavian research on system development", *Scandinavian Journal of Information Systems* Vol. 7, No. 1, pp. 73-98.
- Bradbury, Hilary and Reason, Peter** (2001) "Conclusion: Broadening the bandwidth of validity: Issues and choice-points for improving the quality of Action Research", in Reason, Peter and Bradbury, Hilary (eds) *Handbook of Action Research. Participatory Inquiry and Practice*. London: SAGE Publications, pp. 447-455.
- Braidotti, Rosi** (1994) *Nomadic Subjects. Embodiment and Sexual Difference in Contemporary Feminist Theory*. New York: Columbia University Press.
- Bush, Corlann Gee** (1983) "Women and the assessment of technology: to think, to be; to unthink, to free", in Rothschild, Joan (ed.) *Machina ex Dea: Feminist Perspectives on Technology*. New York: Pergamon, pp. 151-170.
- Chambers, Robert** (1997) *Whose Reality Counts? Putting the First Last*. London: IT Publications.
- Cooke, Bill and Kothari, Uma** (2001) "The case for participation as tyranny", in Cooke, Bill and Kothari, Uma (eds) *Participation: The New Tyranny?* London: Zed Books, pp. 1-15.
- Corell, Elisabeth** (1999) *The Negotiable Desert*. Linköping: Linköping University Dissertation.
- Crawley, Heaven** (1998) "Living up to the empowerment claim? The potential of PRA", in Guijt, Irene and Kaul Shah, Meera (eds) *The Myth of Community. Gender Issues in Participatory Development*. London: IT Publications, pp. 24-34.
- Crouch, Martha** (2000) "Improving accountability within the research community", in Rydhagen, Birgitta and Dackman, Carin (eds) *Proceedings of Dolly and the Bean. Understanding Biotechnology in Broader Contexts* 19-21 February 1999. Luleå: Luleå University of Technology, pp. 92-94.
- Drangert, Jan-Olof** (1993) *Who Cares about Water? Household Water Development in Sukumaland, Tanzania*. Linköping: Linköping University Dissertation.
- Dreyer, Lynette** (2000) *Disappointments of Participation: Finding the Correct Role for Community Participation*.

- <http://www.up.ac.za/academic/libarts/polsci/awiru/op15.html> (read 14/9/2001).
- Elliott, John** (1991) *Action Research for Educational Change*. Milton Keynes: Open University Press.
- Faulkner, Wendy** (2000) “The power and the pleasure? A research agenda for ‘making gender stick’ to engineers”, *Science, Technology and Human Values* Vol. 25, No. 1, pp. 87-119.
- FINNIDA** (1994) *Looking at Gender, Water Supply and Sanitation*. Helsinki: FINNIDA.
- Francis, Paul** (2001) “Participatory development at the World Bank: The primacy of process”, in Cooke, Bill and Kothari, Uma (eds) *Participation: The New Tyranny?* London: Zed Books, pp. 72-87.
- Gibbons, Michael, Limoges, Camille, Nowotny, Helga, Schwartzman, Simon, Scott, Peter and Trow, Martin** (1994) *The New Production of Knowledge. The Dynamics of Science and Research in Contemporary Societies*. London: SAGE Publications.
- Guijt, Irene and Kaul Shah, Meera** (1998) “Waking up to power, conflict and process”, in Guijt, Irene and Kaul Shah, Meera (eds) *The Myth of Community. Gender Issues in Participatory Development*. London: IT Publications, pp. 1-23.
- Gulbrandsen, Elisabeth** (1995) *The Reality of our Fictions. Notes towards Accountability in (Techno)science*. Luleå: Luleå University of Technology Licentiate Thesis 1995:20.
- Gulbrandsen, Elisabeth and Trojer, Lena** (1996) “Authority in transformation”, *The European Journal of Women’s Studies* Vol. 3, No. 2, pp. 131-147.
- Haglund, Jan-Erik, Olofsson, Birgitta, Rydén, Maria and Tideström, Henrik** (1999) *Kompletterande Avloppslösningar i Flerfamiljshus och Offentliga Lokaler* [Alternative Sanitation Solutions in Apartment Buildings and Official Buildings]. Stockholm: VA-Forsk Rapport 1999:10.
- Hallström, Jonas** (2001) *The Healthy City and Modernity: The Evolution of Water Supply and Sewerage in Norrköping and Linköping, Sweden, 1860-1920*. Linköping: Linköping University, manuscript.
- Haraway, Donna** (1997) *Modest\_Witness@Second\_Millennium.FemaleMan©\_Meets\_OncoMouse™*. New York: Routledge.
- Harding, Sandra** (1986) *The Science Question in Feminism*. Milton Keynes: Open University Press.
- Heath, Deborah** (1997) “Bodies, antibodies and modest interventions”, in Downey, Gary Lee and Dumit, Joseph (eds): *Cyborgs and Citadels. Anthropological Interventions in Emerging Sciences and Technologies*. Santa Fe: School of American Research Advanced Seminar Series, pp. 67-82.
- Humble, Morag** (1998) “Assessing PRA for implementing gender and development”, in Guijt, Irene and Kaul Shah, Meera (eds) *The Myth of Community. Gender Issues in Participatory Development*. London: IT Publications, pp. 35-45.
- Janzon, Mirva** (2002) *Lokal Demokrati – en Lärandestrategi. Erfarenheter från Tegelvikens Skola* [Local Democracy – a Learning Strategy. Experiences from Tegelviken School]. Eskilstuna: University College of Mälardalen.
- Jeppsson, Ulf, Hellström, Daniel, Gruvberger, Christopher, Baky, Andras, Malmén, Linda, Palm, Ola, Palmqvist, Helena and Rydhagen, Birgitta**

- (2002) *Framework for Analysis of Treatment Systems for Source-Separated Wastewater and Organic Household Waste*. Paper presented at The International Water Association (IWA) World Water Congress, 7–12 April 2002 in Melbourne.
- Johnsson-Odim, Cheryl** (1991) “Common themes, different contexts. Third World women and feminism”, in Mohanty, Chandra Talpade, Russo, Ann and Torres, Lourdes (eds) *Third World Women and the Politics of Feminism*. Bloomington and Indianapolis: Indiana University Press, pp. 314–327.
- Keller, Evelyn Fox** (1992) *Secrets of Life Secrets of Death*. London: Routledge.
- Kerr, Anne** (1998) “Toward a feminist natural science: Linking theory and practice”, *Women’s Studies International Forum* Vol. 21, No. 1, pp. 95–109.
- Law, John** (1987) “Technology and heterogeneous engineering: the case of Portuguese expansion”, in Bijker, Wiebe, Hughes Thomas and Pinch Trevor (eds) *The Social Construction of Technical Systems: New Directions in the Sociology and History of Technology*. Cambridge, Mass: MIT Press, pp. 111–134.
- Lincoln, Yvonna** (2001) “Engaging sympathies: relationships between action research and social constructivism”, in Reason, Peter and Bradbury, Hilary (eds) *Handbook of Action Research. Participatory Inquiry and Practice*. London: SAGE Publications, pp. 124–132.
- Maguire, Patricia** (1993) “Challenges, contradictions, and celebrations: Attempting participatory research as a doctoral student”, in Park, P., Brydon-Miller, M., Hall, B., Jackson, T. (eds) *Voices of Change: Participatory Research in the United States and Canada*. Westport, C.T: Bergin & Garvey, pp. 157–176.
- Malbert, Björn** (1998) *Urban Planning Participation: Linking Practice and Theory*. Gothenburg: Chalmers University of Technology Dissertation.
- McFadden, Patricia** (2000) “Cultural practices as gendered exclusion: Experiences from Southern Africa”, Keynote in Proceedings from *Power, Resources and Culture in a Gender Perspective* 26–27 October 2000. Uppsala: Collegium for Development Studies and Uppsala University. Utsikt mot utveckling no. 14, pp. 88–99.
- Michener, Victoria** (1998) “The participatory approach: Contradiction and co-option in Burkina Faso”, *World Development* Vol. 26, No. 12, pp. 2105–2118.
- Mohan, Giles** (2001) “Beyond participation: Strategies for deeper empowerment”, in Cooke, Bill and Kothari, Uma (eds) *Participation: The New Tyranny?* London: Zed Books, pp. 153–167.
- Molyneux, Maxine** (1985) “Mobilisation without emancipation? Women’s interests, the state, and revolution in Nicaragua”, *Feminist Studies* Vol. 11, No. 2., pp. 227–254.
- Morgall, Janine Marie** (1991) *Developing Technology Assessment. A Critical Feminist Approach*. Lund: Lund University Dissertation.
- Moser, Caroline** (1989) “Gender planning in the Third World: Meeting practical and strategic gender needs”, *World Development* Vol. 17, No. 11, pp. 1799–1825.
- Mosse, David** (2001) “‘People’s knowledge’, participation and patronage: Operations and representation in rural development”, in Cooke, Bill and Kothari, Uma (eds) *Participation: The New Tyranny?* London: Zed Books, pp. 16–35.
- Mulinari, Diana** (1996) “‘Third World Women’ *Difference* and Domination”, *Kvinder, Kon & Forskning* Vol. 5, No. 4, pp. 80–98.
- Mörtberg, Christina** (2000) “Teknikvetenskap och genusforskning eller Creating Better Worlds through Imaginations” [Technoscience and gender research, or



- Creating Better Worlds through Imaginations], in *Genusforskningens relevans. Slutrapport från integreringsarbete i åtta svenska forskningsråd* [The Relevance of Gender Research. Final Report from Integration Work in eight Swedish Research Councils]. Stockholm.
- Nowotny, Helga, Scott, Peter and Gibbons, Michael** (2001) *Re-Thinking Science. Knowledge and the Public in an Age of Uncertainty*. Cambridge: Polity Press.
- Næss, Arne** (1981) *Ekologi, Samhälle och Livsstil* [Ecology, Society and Lifestyle]. Stockholm: LTs förlag (original from 1973).
- Ogundipe-Leslie, Molar** (1994) *Recreating Ourselves: African Women & Critical Transformations*. New Jersey: African World Press, Inc.
- RDP – The Reconstruction and Development Programme** (1994). Johannesburg: The ANC.
- Rydhagen, Birgitta** (2002) *Boendeaspekter på Resurseffektiv Hantering av Svartvatten och Organiskt Hushållsavfall* [User Aspects on Resource Efficient Handling of Black-water and Organic Kitchen Waste]. Stockholm: VA-Forsk rapport (forthcoming).
- Schön, Donald** (1995) *The Reflective Practitioner. How Professionals Think in Action*. Aldershot: Ashgate ARENA (first edition 1983).
- Scoggins, Jane and Winter, Richard** (1999) “The patchwork text: A coursework format for education as critical understanding”, *Teaching in Higher Education* Vol. 4, No. 4, pp. 485-500.
- Shiva, Vandana** (1993a) *Monocultures of the Mind*. London: Zed Books and Penang: Third World Network.
- Shiva, Vandana** (1993b) “Vetenskap, teknik och 500 år av kolonisationer” [Science, technology and 500 years of colonization], *VEST Tidskrift för Vetenskapsstudier* Vol. 8, No. 2, pp. 3-16.
- Shiva, Vandana** (1997) *The Sacred Cow and the Mad Cow: Metaphors of Ecofeminism and Technofeminism*, unpublished lecture manuscript (see forthcoming Saunders (ed.) *Feminist post-development thought* from Zed Books).
- SIDA** (1994) *Gender and Water Resources Management*. Report from a workshop held in Stockholm 1-3/12/1993. Stockholm: SIDA.
- Smith, Dorothy** (1987) “Women’s perspective as a radical critique of sociology”, in Harding, Sandra (ed.) *Feminism and Methodology*. Bloomington: Indiana University Press.
- Sundin, Kåre and Tufvesson, Anna** (1995) *Sustainable Land Use in Tamil Nadu, India: Farmers’ Perceptions and Prospects for the Future. A Report from a Minor Field Study*. Luleå: Luleå University of Technology 1995:023E.
- Söderberg, Henriette** (1999) *Kommunerna och Kretsloppet – Avloppssektorns Förändring från Rening till Resurshantering* [The Municipalities and Recycling – The Change of the Sanitation Sector from Purification towards Resource Handling]. Linköping: Linköping University Dissertation.
- Titus, Rian, Pietersen, Kevin, Williams, Milicent, Adams, Shafick, Colvin, C. and Saayman, I.** (2002) *Groundwater Assessment and Strategies for Sustainable Resource Supply in Arid Zones – The Namaqualand Case Study*. Cape Town: University of the Western Cape. Report to the Water Research Commission on the Project “A groundwater supply assessment and strategy for the Western Karoo, Namaqualand and Bushmanland”.

- Trojer, Lena** (2002) *Genusforskning inom Teknikvetenskapen – en Drivbänk för Forskningsförändring* [Gender Research in Technoscience – a Hotbed for Transformation of Research]. Stockholm: Högskoleverket.
- Wagner, Ina** (1997) “Boundary confusions and embeddings. Gender issues in the design of electronic work spaces”, in Moser, Ingunn and Aas, Gro Hanne (eds) *Technology and Democracy: Gender, Technology and Politics in Transition?* Oslo: University of Oslo TMV Skriftserie Nr. 29, pp. 169-178.
- Warren, Karen** (1993) “Introduction to ecofeminism”, in Zimmermann, Michael (ed.) *Environmental Philosophy: From Animal Rights to Radical Ecology*. Englewood Cliffs, N.J.: Prentice-Hall, pp. 253-272.
- White Paper for National Water Supply and Sanitation Policy** (1994) Cape Town: Department of Water Affairs and Forestry.
- Wibeck, Victoria** (2000) *Fokusgrupper. Om Fokuserade Gruppintervjuer som Undersökningsmetod* [Focus Groups. On Focused Group Interviews as Survey Method]. Lund: Studentlitteratur.
- Widahl, Karin, Renström Johansson, Åsa, Berg, Per E O, Edén, Michael och Dahlman, Sven** (1999) *Avlopp för Kretslopp. Ett Beteende Perspektiv på Tillblivelse, Drift och Användning av Urinseparerande System* [Sewage for Recycling. A Behavioural Perspective on Inception, Maintenance and Use of Urine Diverting Systems]. Göteborg: Chalmers tekniska högskola Rapport 1999:2.
- Wilkinson, Sue** (1998) “Focus groups in feminist research: Power, interaction, and the co-construction of meaning”, *Women’s Studies International Forum* Vol. 21, No. 1, pp. 111-125.
- Wilkinson, Sue** (1999) “How useful are focus groups in feminist research?”, in Barbour, Rosaline and Kitzinger, Jenny (eds) *Developing Focus Group Research. Politics, Theory and Practice*. London: SAGE Publications.
- Winter, Richard, Buch, Alyson and Sobiechowska, Paula** (1999) *Professional Experience & The Investigative Imagination. The ART of Reflective Writing*. London: Routledge.
- Wolf, Diane** (1996) “Preface” and “Situating feminist dilemmas in fieldwork”, in Wolf, Diane (ed.) *Feminist Dilemmas in Fieldwork*. Colorado: Westview Press, pp. ix-xii; 1-55.
- Wynne, Brian** (1989) “Sheepfarming after Chernobyl”, *Environment* Vol. 31, No. 2, pp. 11-39.
- Zeichner, Kenneth** (1993) “Action research: personal renewal and social reconstruction”, *Educational Action Research* Vol. 1, No. 2, pp. 199-219.

## APPENDIX 1

### USER PERSPECTIVES ON ECOLOGICAL SANITATION TECHNOLOGIES IN SWEDEN<sup>1</sup>

#### INTRODUCTION

Up until the end of the nineteenth century, urban toilet waste was transported to agricultural land and used as fertilizer. Nutrients were recycled to secure the urban food supply. However, towards the end of the nineteenth century, the strategy changed from recycling to removal as a result of the trust in the self-purifying capacity of natural waters, the fear of disease transmission, and the introduction of artificial fertilizers (Hallström, 2001). The introduction of the waterborne sewage system was subject to a great deal of political negotiation in the municipal arena. Since the piped waterborne sewage system became the norm, the development of the system has been regarded as a purely technical matter and has been left in the hands of engineers. Gradually, the system has included more advanced purification techniques to remove organic matter, phosphorous and nitrogen. Today, sanitation specialists still have the main responsibility for sewage systems, although politicians' interest in different development alternatives has increased since the establishment of the concept of Sustainable Development in the 1990s (Söderberg, 1999 and Hallström, 2001). The current development in the sanitation sector includes improvement of the conventional treatment procedures, attempts to reduce abuse of the system, and small-scale introduction of ecological sanitation alternatives in residential areas.

In the research project *Resource efficient handling of blackwater and organic kitchen waste*, different ecological sewage systems were compared with regard to their nutrient recycling potential, pollutant control possibilities, exergy efficiency, and user aspects (Jeppsson et al., 2002). I was responsible for the user study, and my original plan was to get involved in an ongoing project where the sewage system in an existing housing area was about to be changed. After a number of similar projects in the 1980s and 1990s, most of which concerned installing urine diversion systems, the spread of alternative sewage systems appears to have come to halt. There are several possible reasons for this. One is that the existing alternative systems are currently being evaluated and the problems they have generated will need to be dealt with. Another problem has been finding an outlet for the nutrients at farms near the project areas.

I therefore decided to conduct interviews with users who already live with ecological sanitation alternatives. It occurred to me that most of the urine diversion projects had already been studied, and although different interviews generate different answers and different analyses, I did not want to subject the users of those systems to yet another interview session. Instead, I evaluated the results in the reports from these

---

<sup>1</sup> This is a summary and translation from Swedish of the empirical material presented in Rydhagen, 2002.

projects and focused my empirical research on the few other alternatives that exist. For this purpose, I chose three locations for interviews, namely:

- Smedjebacken municipality, where organic kitchen waste disposers have been introduced to collect organic kitchen waste through the sewage system,
- Vibyåsen in Sollentuna municipality, where approximately 100 households are connected to a local sewage system where blackwater (toilet water) and greywater (other household wastewater) are separated and handled locally, and
- Tegelviken School in Eskilstuna municipality, where a vacuum system for blackwater and organic kitchen waste is in place, and greywater is treated locally.

### **BRIEF INTRODUCTION TO THE AREAS**

In Smedjebacken, kitchen waste disposers are one of three alternatives for organic waste collection that were offered when the municipality adopted a new system for solid waste collection in 2000/2001. The others are municipal collection of the organic waste for a regular fee or home composting with no fee. The disposers are also without regular fee, but the house owner had to buy the disposer<sup>2</sup>. The disposer is installed under the kitchen sink, and grinds the waste mixed with water before it enters the sewage pipe. The major municipal property owner of rented flats installed disposers in an area with approximately 100 apartments to begin with. This area had been subject to substantial internal and external renovation, and the renovation work was just finished when the disposers were installed.

In Vibyåsen, the residential area was built in 1995-96 and consists of 47 terraced houses and 88 detached houses. The terrain naturally divides the area into two, and I concentrated on the area with detached houses. Here, the residents participated in the construction work. This was a way to keep the costs down and meant that they were able to have a say in the detailed solutions during the construction phase. The requirements regarding local treatment of sewage with division of blackwater and greywater were laid down by the municipality, and the building contractor had decided to install urine diversion toilets to reduce the flush water (but not to separate the urine)<sup>3</sup>. The blackwater is collected in tanks, while the greywater passes through a filter and a series of dams before reaching the recipient. A farmer empties the blackwater tanks regularly and transports the material to his farm for treatment. The municipality was aware of the experimental nature of the project and was prepared to take the responsibility for the extra costs and work that the system would require.

Tegelviken School was planned and built in 1995-98 and is located in the village of Kvicksund on the border between Västerås and Eskilstuna municipalities. Eskilstuna municipality chose to introduce a more environmental profile, and it was decided that the village residents and local organizations should be invited to participate in the planning of the school. Parents as well as representatives of local organizations were invited to join groups where the functions of the school (age integration, adaptation for dis-

---

<sup>2</sup> Information from Inger Svensson, Smedjebacken Energi och Vatten, 13/9/2000 and 19/4/2002.

<sup>3</sup> Information about the area was provided by Britta Orring and Björn Gutfelt at the municipality in meetings held on 26/1/2001, 1/6/2001 and 13/12/2001.

abled children, etc.) as well as building materials, paint colours, etc. were discussed (Janzon, 2002). The blackwater and greywater are collected and treated in a similar way as in Vibyåsen.

## **METHOD**

I intended to carry out focus group interviews (Wilkinson, 1998, Barobur and Kitzinger, 1999 and Wibeck, 2000) with residents/pupils in each of the areas to discuss what the sewage system meant to them as users in terms of technical functionality and ideas and principles. The people that I came into contact with in Smedjebacken argued that they did not have much to say, but two women agreed to individual telephone interviews. In Vibyåsen I organized a focus group interview with two men and two women who had all been involved in the construction process. This interview went well and required little intervention from me. In Tegelviken, I did a focus group interview with two girls (in classes 5 and 9) and four boys (in classes 5, 7 and 9). The school caretaker was present during the interview and intervened every now and again with information about the technical system. This interview was more structured with a series of questions and answers or short discussions. I also interviewed the Principal and the caretaker of the school, the cleaning and kitchen staff.

The focus group interviews were analyzed thematically, and I named the themes during the analysis process. Since the various interviews were all rather different, the themes in the different interviews also vary. The main idea was to arrange the interview material in order to include what the participants said that is of relevance to sanitation and participation/communication with decision-makers, if any.

As mentioned, the statements regarding urine diversion projects have been summarized from reports from previous user studies.

## **KITCHEN WASTE DISPOSERS**

Kitchen waste disposers were previously prohibited in Sweden, but are now being introduced as a way to collect and make use of organic kitchen waste through the sewage system. User reactions indicate that they are content with the disposers, which facilitate kitchen work (Karlberg and Norin, 1999; Nilsson et al., 1990 and Nilsson, 1999; my interviews in Smedjebacken on 19 and 25 March 2001). In privately owned houses, the owners can decide themselves whether to install a disposer or not, while in rented flats, the residents can decide to what degree they want to use it.

One of the interviewed women admitted that she had been sceptical towards the disposer before it was installed, but now she appreciated it. Both women reported that they were asked for their opinion in advance, but that this was not taken into account when the final decision was made by the property owner. The interviewed women said that the whole renovation process was supposed to be more participatory than it had been in practice and they seemed a bit resigned – even though the final result of the renovation was positive.

## URINE DIVERSION

Urine diversion projects<sup>4</sup> generally collect the urine locally in tanks, from where it is transported to farms after six months of storage. Faeces are usually transported with the greywater in the conventional sewage system. The toilet design therefore differs visibly from conventional toilets, as the bowl is divided in two. The front bowl for urine is flushed with very little water. The back bowl for faeces and toilet paper uses more flushing water. Men are supposed to sit down when urinating, which has attracted much attention in studies and debates. In the Ecohouse project in Hallsberg, where urine diversion toilets were installed as part of a renovation project and where the new tenants received very little information about the sanitation system, the urine collection was measured to be only about 50 percent of the calculated volume. In other areas (e.g. Understenshöjden), where the information and feedback was more extensive, the collection rate reached 80 percent of the expected volumes (Jansson and Mårtensson, 1999). The issue of how women should dispose of toilet paper after urinating also differs, depending on the extent of information provided and the commitment of the residents. In the Ecohouse, again, most women flush the paper down the back bowl after each trip to the toilet, reducing the water-saving potential of the toilet (*ibid.*). In Ekoporten, many women collect the paper in waste-paper baskets beside the toilet (personal observation).

The main problem with the urine-diverting toilet seems to be insufficient flushing and frequent crystallization in and blockage of the urine pipe. This problem has caused many users to pour additional water into the bowl after urination. The toilets also need more frequent cleaning. Although this is reported and analyzed in different ways by different authors, my interpretation is that in areas where the urine diversion has been well introduced and integrated with other environmental activities, the residents show more tolerance towards the problems connected to the specific characteristics of the system. In Understenshöjden, studies at two different times showed a decreased tolerance over time (Lindgren, 1999).

It is worth noting that the caretakers at Ekoporten in Norrköping report less blockage problems in this house than in the neighbouring houses with conventional systems<sup>5</sup>, since the residents in Ekoporten are more careful with their flats in general and toilets in particular (Svane and Bergdahl, 1999).

---

<sup>4</sup> The urine diversion projects that are covered in this summary include the Ecohouse in Hallsberg (Widahl et al., 1999; Jansson and Mårtensson, 1999), Liljan in Linköping (Haglund et al., 1999), Ekoporten in Norrköping (Botta, 2000; Svane and Bergdahl, 1999), Palsternackan (Haglund et al., 1999; Jönsson et al., 2000) and Understenshöjden in Stockholm (Lindgren, 1999; Jönsson et al., 2000).

<sup>5</sup> The area consists of several rental apartment buildings built in the 1960s, and Ekoporten is an 18-suite apartment building in the area that was chosen to test ecological renovation methods and solutions.

## BLACKWATER SYSTEM IN VIBYÅSEN

### *The toilet revolution*

According to the participants in the focus group interview, the building contractor had decided on urine diversion toilets because they had interpreted the municipality's specifications as requiring them. When, during the construction work, the residents discovered that there was only one pipe for blackwater in the ground, they protested against the urine diversion toilets. They argued that these toilets would not fit in the bathrooms and would create extra problems for no good reason, as the urine would not be collected separately anyway. The residents found out that the municipality did not require urine diversion specifically, and so they went to war with the contractor to get conventional (low-flush) toilets. According to one of the male participants, the fight got quite ugly before the residents' claims were finally accepted, and so he nicknamed the process *the toilet revolution*.

### *The function of the toilets*

The main problem with the toilets was frequent blockage. This occurred in some houses more than others, depending on their location along the pipeline. The participants argued that the blockages were due to the insufficient gradient of the pipes, combined with wrong pipe dimension and low water volumes. The participants had not had very frequent blockages, although one man got into the habit of noting when blockages started to build up and reporting this to the municipality before a complete blockage developed. According to the participants, they flushed the toilet more frequently and with a larger amount of water than was recommended, in order to reduce the blockage problems. They were also aware that the municipality had to pour additional water into the top of the pipe system regularly to clear the pipes. Thus, the water consumption in the blackwater system was higher than originally intended.

The problems for the participants were not insurmountable, and they praised the municipality for taking responsibility for the work as well as the costs. The participants did not blame the blockages on the principle of separation, but on the poor quality of the installation work. They also commented that the system is more sensitive, and that some of their neighbours are careless and flush undesired items down their toilets, which adds to the problems.

### *Sewage sludge as fertilizer*

The collection and treatment of the blackwater were briefly commented on in connection with the discussion about the amount of flushing water. The participants were aware of the problems that the extra water caused for the recipient farmer, but one of the male participants claimed that the treatment installation at the farm included equipment to separate out the water<sup>6</sup>.

---

<sup>6</sup> According to Britta Orring, most of the blackwater is currently transported to the municipal treatment plant, as the volume and the water content are too great to be useful to the farmer. The residents in Vibyåsen have not been informed of this.

Only when I asked about their perceptions of the use of blackwater as fertilizer did the participants comment on where the blackwater went after leaving their area. They all agreed that this was a good idea, and one of the men expressed pride in contributing to the recycling of nutrients. However, they were doubtful as to whether this kind of system would be applicable on a larger scale in urban areas.

#### *Greywater treatment*

The system for treatment of greywater was more visible in the area than the blackwater system. The water was led to a filter, after which it passed through a series of ponds. This system has created more problems for the residents (bad smell, fear for children who play near the ponds) and the municipality (problematic consistency and difficult to reach required purification levels). However, the interview participants were still positive to the idea of local treatment, and in their area, the ponds were placed behind a small group of trees, where the smell and the danger for children were less troublesome than in the other project area.

I asked the participants if they had become more careful with how they used the sewage system after they moved to Vibyåsen. The two women in the interview group claimed always to have been careful about what they threw down the toilet, but said that they were now more aware of how to rinse paint brushes, what washing detergent to buy, etc. They have been recommended to buy detergents without phosphate, but have not been able to find phosphate-free dishwasher detergent.

#### *Environmental concern in the area*

The participants reported that the municipality had been very clear when the plots and houses were sold that the area was to be developed as an “environmental area”. This included home composting as well as taking greater care with the sewage systems. The participants were all positive to this idea and gave a number of examples to illustrate how their commitment manifested itself. They took great pains to dispose of recyclable materials at recycling stations, they worried about the accessibility to busses and trains for commuters, and they actively sought out environmentally labelled household chemicals in the shops. All four were both proud and happy to live in an area where environmental awareness was encouraged without requiring too much from the residents. They hoped that the experiences from Vibyåsen would lead to a spread of these kinds of ideas, and the problems that had arisen were explained more by carelessness during construction than by the ecological solutions per se. Nevertheless, they complained that some of their neighbours were less committed to the ecological project and had only moved into the area because of the low house prices.

#### *Communication with the municipality*

The participants agreed that the municipality had been very reliable and prompt in their efforts in Vibyåsen. More generally, however, the participants were frustrated over conflicting signals concerning bus services, information about household chemicals and access to recycling stations. They also complained about the information material that they had been given about Vibyåsen. There was inadequate information about the effects on the effluent water of the change to phosphate-free detergents, and



they called for more regular information. They felt that information had become less frequent and that this reduces the residents' motivation to continue their efforts.

In summary, the interview gave an impression of residents who are content with their sewage system, which has a conventional appearance in the households (as opposed to urine diversion toilets) and which places no demands on them for increased contribution, thanks to timely support from the municipality when blockages occurred. The interview revealed that this kind of housing area allows people to live in a more environmentally friendly manner using conventional technical functionality, but that it also offers the possibility to avoid these efforts. The residents' involvement in the construction work created room for participation in the discussion of technical solutions. However, this was not encouraged by the municipality or the building contractor, but was done on the initiative of the residents themselves.

### VACUUM BLACKWATER SYSTEM IN TEGELVIKEN SCHOOL

*What do you know about the vacuum system?*

Not all of the participants in the focus group interview were aware of the reasons for the vacuum system. One of the girls and one of the boys were so-called guides in their classes and had been trained to be able to show visitors around the school. They were both well informed about the vacuum system. The boy mentioned the noises that each flush creates in the culvert where the pipes run. Two other boys made vague references to "energy saving" and "the environment", at which point the caretaker interrupted with a short explanation that the blackwater is taken to a farm and spread on the fields.

The flushing button was placed almost behind the lid of the toilet, with the aim that the lid should be closed before flushing. I observed that it was still possible to flush with the lid open, and it became apparent that not all participants were aware that they were supposed to close the lid before flushing.

Two boys said that the toilets were strange and ugly<sup>7</sup>.

*What do you think of the noise?*

The noise in itself did not seem to disturb the users. One of the girls said she never goes to the toilet, but a boy said he did not care about the noise if he needs to go. Neither of the girls thought their friends worried about the noise, but when someone uses the toilet next door during lessons, the noise was disturbing. One of the boys argued that this was due to lack of insulation.

*Abuse of the blackwater system*

All the participants took exception to the idea of flushing inappropriate items down the toilet. Although the vacuum toilets are more sensitive to blockages, most of the participants said they are as careful with their toilets at home. One of the boys reflected on the nearness to the farm where the blackwater was spread, saying that if he flushed a

---

<sup>7</sup> The only difference from conventional toilets is that there is no water tank.

sock down the toilet, it might reappear in his breakfast cereal. In other words, the nearness made the consequences of the use of the system visible to the participants, although they were very vague in their responses to the first question.

#### *Blockages*

According to the caretaker, blockages are not more frequent than in other schools with conventional sewage where he had worked. He could clear small blockages himself. When blockages occur, the toilets will not flush. None of the participants seemed to find blockages problematic, as there are always other toilets that function.

#### *Nutrient recycling*

One of the boys lived next door to the farm where the blackwater is spread, and he was aware of the smell during the spreading. The participants still agreed that it is positive that their blackwater is used as fertilizer. Two boys specified that this is better than unnecessary expenditure on artificial fertilizers, and one of them added that the blackwater system is more suitable than conventional sewage sludge for this purpose. One of the girls commented that the same person might use different sewage systems in different ways, depending on the design, and this argument added to the preference of blackwater collection over conventional sewage.

#### *Comments made by the staff*

The kitchen and cleaning staff (the same persons perform both functions) that I interviewed were actively interested in environmental issues. One of the female staff commented specifically on the toilets and said that she did not mind the noise of the vacuum system. She could imagine having a similar system in her home, and seemed to prefer the vacuum system to urine diversion toilets. In the school kitchen, the organic waste is added to the blackwater tank through a waste disposer. When the disposer finally started to function in 2001, they found that it facilitated their work.

The caretaker of the school had no specific comments to the system, which according to him required the same amount of work as a conventional system.

## **DISCUSSION**

The different alternatives within ecological sanitation all seem to be acceptable to the users, although they create some problems – mainly due to blockages and other technical inadequacies. It seemed that in the more integrated approaches, where the sanitation system was part of a larger renovation/construction project and where the residents were well informed, the users were more content and more prepared to accept the technologies despite the problems. However, acceptance seemed to run the risk of decreasing over time, if the problems continued.

The examples of introduction of ecological sanitation alternatives in Sweden are part of a broader discussion of citizenship and local democracy. In Smedjebacken, the residents were asked for their opinion about kitchen waste disposers before the system was installed, but their reluctance was not taken into account when the property owner decided to install disposers in their apartments. The women were satisfied with the

disposers, although they had been sceptical before they were installed, but apparently, the dialogue between the decision-makers and the residents was not well established. In Tegelviken School, the entire building process was opened up to local participation, and the experience was described as very positive in terms of functionality and democracy. The sanitation system was not in focus, but the general respect for the pupils as well as the staff and the local population on a whole has created an awareness among the pupils about the sanitation system as well. In Vibyåsen, the authorities did not invite the users to be involved, but the residents themselves took the initiative to become involved when they found it important, in order to influence the blackwater system.

## REFERENCES

- Barbour, Rosaline and Kitzinger, Jenny** (1999) "Introduction: the challenge and promise of focus groups", in Barbour, Rosaline and Kitzinger, Jenny (eds) *Developing Focus Group Research. Politics, Theory and Practice*. London: SAGE Publications, pp. 1-20.
- Botta, Marina** (ed., 2000) *Miljöanpassad Ombyggnad. Utvärdering av Ekoporten och Erfarenheter från andra Projekt* [Ecological Renovation. Evaluation of Ekoporten and Experiences from other Projects].
- Haglund, Jan-Erik, Olofsson, Birgitta, Rydén, Maria and Tideström, Henrik** (1999) *Kompletterande Avloppslösningar i Flerfamiljshus och Offentliga Lokaler* [Alternative Sanitation Solutions in Apartment Buildings and Official Buildings]. Stockholm: VA-Forsk Rapport 1999:10.
- Hallström, Jonas** (2001) *The Healthy City and Modernity: The Evolution of Water Supply and Sewerage in Norrköping and Linköping, Sweden, 1860-1920*. Linköping: Linköping University, manuscript.
- Jansson, AnnMari and Mårtensson, Mona** (1999) *Kretsloppsanpassning i Stadsbygd. En Utvärdering av Miljöanpassad VA-teknik i Kommunalägda Hyreshus* [Ecological Transformation in Urban Areas. An Evaluation of Ecological Sanitation Technologies in Municipal Rental Apartment Houses]. Stockholm: University of Stockholm, Department of Sociology.
- Janzon, Mirva** (2002) *Lokal Demokrati – en Lärandestrategi. Erfarenheter från Tegelvikens Skola* [Local Democracy – a Learning Strategy. Experiences from Tegelviken School]. Eskilstuna: University College of Mälardalen.
- Jeppsson, Ulf, Hellström, Daniel, Gruvberger, Christopher, Baky, Andras, Malmén, Linda, Palm, Ola, Palmqvist, Helena and Rydhagen, Birgitta** (2002) *Framework for Analysis of Treatment Systems for Source-Separated Wastewater and Organic Household Waste*. Paper presented at The International Water Association (IWA) World Water Congress, 7-12 April 2002 in Melbourne.
- Jönsson, Håkan, Vinnerås, Björn, Höglund, Caroline, Stenström, Thor Axel, Dalhammar, Gunnel and Kirchmann, Holger** (2000) *Källsorterad Humanurin i Kretslopp* [Source Separated Human Urine for Recycling]. Stockholm: VA-Forsk Rapport 2000:1.
- Karlberg, Tina and Norin, Erik** (1999) *Köksavfallskvarnar – Effekter på Avloppsreningsverk. En Studie från Surahammar* [Organic Kitchen Waste Disposers – Effects

- at the Sewage Treatment Plant. A Study from Surahammar]. Stockholm: VA-Forsk Rapport 1999:9.
- Lindgren, Magnus** (1999) *Urinsorterande Toaletter – Rensning av Stopp samt Uppsamling och Attityder* [Urine Diverting Toilets – Clearing Blockages, Collection and Attitudes]. Uppsala: the Swedish University of Agricultural Science, Department of Agricultural Engineering Department Report 99:05.
- Nilsson, Peter, Hallin, Per-Olof, Johansson, Jörgen, Karlén, Lennart, Lilja, Gösta, Petersson, Bernt Å and Pettersson, Johan** (1990) *Källsortering med Avfallskvarnar i Hushållen – En Fallstudie i Staffanstorps* [Source Separation with Kitchen Waste Disposers in the Households – A Case Study in Staffanstorps]. Lund: Lunds Tekniska Högskola, Department of Water Supply and Sanitation Engineering Bulletin Series VA No. 56.
- Nilsson, Hans-Göran** (1999) *Bostadsrättsföreningen Glasförgyllaren, Staffanstorps. Sammanställning av Svar på Enkät Angående Försöksverksamhet och Permanent Användning av Avfallskvarnar* [Cooperative Building Society Glasförgyllaren, Staffanstorps. Summary of Questionnaire about Pilot and Permanent Use of Kitchen Waste Disposers]. Staffanstorps municipality. Not published.
- Rydhagen, Birgitta** (2002) *Boendenaspekter på Resurseffektiv Hantering av Svartvatten och Organiskt Hushållsavfall* [User Aspects on Resource Efficient Handling of Black-water and Organic Kitchen Waste]. Stockholm: VA-Forsk rapport (forthcoming).
- Svane, Örjan and Bergdahl, Eva** (1999) “Förvalta Ekoporten i Norrköping” [Managing Ekoporten in Norrköping], in *Miljöanpassat boende i Kalmar, Kristianstad och Norrköpings bostadsbolag*. Karlskrona: Boverket.
- Söderberg, Henriette** (1999) *Kommunerna och Kretsloppet – Avloppssektorns Förändring från Rening till Resurshantering* [The Municipalities and Recycling – The Change of the Sanitation Sector from Purification towards Resource Handling]. Linköping: Linköping University Dissertation.
- Wibeck, Victoria** (2000) *Fokusgrupper. Om Fokuserade Gruppintervjuer som Undersökningsmetod* [Focus Groups. On Focused Group Interviews as Survey Method]. Lund: Studentlitteratur.
- Widahl, Karin, Renström Johansson, Åsa, Berg, Per E O, Edén, Michael och Dahlman, Sven** (1999) *Avlopp för Kretslopp. Ett Beteende Perspektiv på Tillblivelse, Drift och Användning av Urinseparerande System* [Sewage for Recycling. A Behavioural Perspective on Inception, Maintenance and Use of Urine Diverting Systems]. Göteborg: Chalmers tekniska högskola Rapport 1999:2.
- Wilkinson, Sue** (1998) “Focus groups in feminist research: Power, interaction, and the co-construction of meaning”, *Women’s Studies International Forum* Vol. 21, No. 1, pp. 111-125.

1



## FEMINIST DIVERSITY - A MEETING BETWEEN NORTH AND SOUTH<sup>1</sup>

As a privileged white young feminist woman, I have had the opportunity to visit places far away from home. One of the most important lessons I have learnt during my travels is how local and situated my own experiences of gender relations and other hierarchies are. A research visit to rural Namaqualand in South Africa in 1997 made me realize more than ever how intertwined different hierarchies are, and how fluid. Gender relations are not a unique or unambiguous problem in development debates. I have also been reminded of how difficult it is for me to assess my own way of looking at different cultures, despite my sincere desire to do so.

To situate myself in relation to the diverse feminisms that exist, I have explored feminist writers who focus on the fluid multiple hierarchies and who have personal experience of what it can mean, in order better to understand the complex situation in which I have decided to do research. In this paper, I also elaborate on the components of “deep feminism”, and discuss how postmodernist feminist theory can be used politically.

Reluctantly, I have categorized feminist writers into two categories, namely AALA (African, Asian and Latin American) and ANAE (Australian, North American and European)<sup>2</sup>. The categorization is not clear, and there are all kinds of interconnections and influences through e.g. migration, cross-cultural studies, shared interests and ethnic diversity within nations. Further, experiences and priorities within ANAE and AALA are of course vastly different. As an increasing part of feminist thought is generated by women with backgrounds other than white Western academic, it is no longer possible to ignore the fact that feminisms are diverse. Different points of departure lead to different priorities concerning what to include in the feminist struggle. It is necessary that feminists allow diversity and stress the fact that different women have different needs, rather than trying to fit all women into one joint project of liberation. Otherwise, it is all too easy to fall in the same trap of categorization and oversimplification that feminists so often criticize in normal science and politics<sup>3</sup>.

---

<sup>1</sup> The research project was financed by Sida/SAREC (the Swedish International Development Cooperation Agency/Department for Research Cooperation) and a travel grant from Nordiska Afrikainstitutet (Nordic Africa Institute).

<sup>2</sup> The acronym for Africa, Asia and Latin America is borrowed from Ogundipe-Leslie (1994: p. 4). It is suggested as a more truly geographical expression than ‘the South’, which does not include Australia in the Southern Hemisphere but does include India and other countries in the Northern Hemisphere. Many writers, in Western countries as well as AALA use the expression ‘the Third World’. This was a politically charged expression when it was established, as it suggested that this part of the world would not strive to join the first world (the West) or the second world (the socialist block), but would create an alternative way. However, I find the ranking of different ‘worlds’ problematic. In correspondence to AALA, ANAE refers to Australia, North America and Europe.

<sup>3</sup> See e.g. Mörtberg, 1997: p. 30ff. for a problematization of reversal of values in gynocentrism.

## THE UNIVERSAL WOMAN

The most obvious lesson learned from reading AALA feminists is that there is no such thing as a “Universal Woman”, who has certain characteristics, certain needs and dreams, and who is deprived of certain rights that men enjoy. The image of a “Universal Woman” has been created partly as an icon in the struggle for women’s rights, and in some respects, it has strengthened the arguments needed for change. This is especially the case when the struggle has taken place within a specific, most often ANAE society. However, the image of Woman as the Other<sup>4</sup> rests on the construction of a dichotomous world (Mulinari, 1996, p. 82), which is often criticized by feminist writers. Dichotomies include those between persons (female/male, white/coloured, poor/rich etc.) as well as between characteristics (nature/culture, professional/personal, subject/object). Dichotomous thinking hinders us from discovering and exploring what Mbilinyi (1992, p. 39f) calls the “gray areas or the interconnections” between the two sides of, for example, women and men, traditional and modern, private and public. In cross-cultural studies, the grey areas of development have been made invisible through a preference for studies of groups of people that have experienced little influence from outsiders, compared to studies of non-Western communities borrowing from Western lifestyles.

In this context, it is interesting to highlight the basis for the construction of women as a group. In general, when we refer to “women”, we refer to people that on the group level more often are victims of rape, have lower salaries, care for old parents, or are hindered from possessing a piece of land. Very rarely do we think of women as “those who carry two X-chromosomes”. The construction of women as a group is exactly that; a construction based on sociological categories rather than on biological characteristics that women share (Mohanty, 1991b, p. 56). When it is realized that the supposedly unifying characteristics are socially constructed, it becomes clear that different women will define themselves according to different problems and possibilities that they associate with their gender. It may be that many women are, and see themselves, as disadvantaged due to their gender. Once that has been said, however, they will continue to define very different priorities. The relationship between Woman and women is not simple (Mohanty, 1991b, p. 53).

## SKIN COLOUR AS POLITICS

“You are not a whitie. I should never sit down and talk with a whitie like I do with you.” My coloured friend in northern South Africa showed me one of the greatest honours I could think of, in a nation where friendships across skin colours are so recent and fragile.

---

<sup>4</sup> In Simone de Beauvoir’s famous book *The Second Sex* (1952) we are given an extensive analysis of woman as the Other. According to de Beauvoir, the Other as a category is defined as soon as we define ourselves as individuals or in groups (see e.g. the introduction to her book). It is thus not only a gender categorization, but applies to each person or group who is not included in the definition to which a person counts him/herself in each situation. The close relations between women and men make the gender otherness very intricate in comparison to other otherness.



When ANAE natives write about people in AALA, or the Third World or the South, there is a strong tendency to continue to construct or make use of existing dichotomies in a way similar to the man–woman dichotomy. Shiebinger (1993) has shown how male European scientists during the eighteenth and nineteenth centuries made great efforts to ascribe characteristics to the African man that were supposed to prove the white man’s superiority. The African man was thus described as beardless (unlike the ancient philosophers), with narrow skulls (like apes), emotional and childish. Interestingly, many of these physical and mental characteristics were the same as those ascribed to European women during the same period. The African woman, when mentioned at all, had to be defined in other ways, to contrast with the European woman. African women were said to be promiscuous, and their breasts and genitalia were compared to those of apes.

Shiebinger’s (1993) account of the imaginative creativity in defining races shows clearly that race is not a biological given but a social or even political categorization (see also Mohanty, 1991a, p. 7). In no country is the non-biological notion of race more evident than in South Africa. The quotation above confirms this. Being a Swede in South Africa, I did not count as white, which was considered a negative characteristic among the coloured people. Mbilinyi (1992, p. 50) describes a similar experience. Being of European descent, married to a Tanzanian man and living in Tanzania, she is “defined as ‘Black’ Mswahili, in contrast to foreign English-speaking ‘black-skinned’ West Africans and African-Americans, who are defined as ‘Europeans’ (Wazungu)”.

Just as gender is often used to refer to women, and very rarely to male gender, race is mainly a way to categorize people of colour. Russo (1991) suggests that we also use the term “white supremacy” to emphasize that we as white persons are also defined in racial terms and that we are highly responsible for how we put it into practice.

### AN OTHER WOMAN

“Third World Woman”, as she is often called, has been constructed in contrast to Woman, i.e. the white ANAE Woman, in the same way as Woman was constructed in contrast to Human, i.e. Man. In the construction of the dichotomy ANAE Woman vs. AALA Woman, the ANAE Woman is conceptualized as middle class, educated and white, while the AALA Woman is thought of as illiterate, peasant and poor (Ogundipe-Leslie, 1994, p. 10). Mulinari writes:

Feminist researchers succeeded in challenging the position of women as the “Other” within social science. They were able to shift the position of women from objects of inquiry to Subjects. However they recreated “Third World Women” as the “Other” within feminist research. Thus, while trying to make WOMAN visible within the discourse of science, they made certain groups of women invisible, women of the “Third World” among them (Mulinari, 1996, p. 84).

This is of course problematic in many senses. Poor, working-class women in ANAE become invisible, as well as the more well-off, middle-class, urban and educated women in AALA.

People (men as well as women) in AALA are often represented as victims with great needs and problems such as famine, environmental disasters and civil wars that have struck some parts of AALA in recent years. Very rarely are people's choices or freedom to act discussed (Mohanty, 1991b, p. 64). Instead, it is expected that help from ANAE is needed to solve the problems that are described. Several AALA authors have voiced an urgent wish to do away with this constructed powerlessness and 'get to see the real Africans as they actually live their lives in the complexity of continuity and change, tragedy and joy, not only in the gleefully, patronizingly reiterated poverty" (Ogundipe-Leslie, 1994, p. 8).

### **MULTIPLE OPPRESSION**

While it is clear that sexual egalitarianism is a major goal on which all feminists can agree, gender discrimination is neither the sole nor perhaps the primary locus of the oppression of Third World women. Thus, a narrowly defined feminism, taking the eradication of gender discrimination as the route to ending women's oppression, is insufficient to redress the oppression of Third World women (Johnsson-Odim, 1991, p. 315).

One of the most important messages from AALA feminism seems to be that oppressions are multifaceted and intertwined. It is not enough to analyze and discuss gender relations, without paying attention to hierarchies based on ethnicity, age, class, sexuality or language. Mbilinyi (1992, p. 50) identifies a quadruple oppression based on gender-class-race/ethnic relations-imperialism. For many women in AALA, the subordination due to gender is reinforced by some of these other oppressive structures, but the oppression may also be reduced for certain groups of women. It is of course not possible to measure oppression quantitatively or to set up a "pecking order", but it is nevertheless important to keep in mind that analyses of hierarchies must include the diversity of combinations that are possible in each concrete location.

Mulinari (1996, p. 86) argues for the prioritization of the process of subordination that results from "the global capitalist enterprise" and the imperialist structures of the world.

### **SITUATED GENDER CONSTRUCTS**

One of the problems with dichotomies is that one side is considered superior to the other. It is easy to guess which side this will be in pairs like traditional/modern, or ANAE/AALA culture (as if those were two homogenous entities). The consequence is that the indigenous society in AALA is judged as backward and oppressive, while modern society is seen as a progressive role model for these cultures (Mbilinyi, 1992, p. 39f).

When paying attention to the diversity among women, and especially among women in AALA, one must be careful not to ascribe ANAE gender constructions and gender hierarchies to the AALA societies in question. One important ANAE gender stereotype, I would say, is that men deal with public issues while women stay at home,

## 1. Feminist diversity

caring for private matters, e.g. their and the men's children, dirty laundry and social relations. In AALA, it becomes very obvious that this division into the private and the public is not valid (Ogundipe-Leslie, 1994, p. 11). Women farmers, for example, outnumber men farmers in most parts of AALA, and they spend long days outside the home to supply the household with fuel and water (which are considered public services, done by men, in ANAE). As the example of water supply implies, what is private and what is public is negotiated in society and has more to do with our expectations of gendered locations than on where and how the task is undertaken (Meena, 1992, p. 4). It may well be that when the water supply is moved from women to men, it is at the same time transferred from private to public in people's minds. This is not only due to the introduction of a public organization around the task or the installation of more sophisticated technologies, although this may be done during the transfer of the task to the male sphere.

Women are not only wives and mothers, as one might expect when comparing with the situation in ANAE a few decades ago. It is a misunderstanding that AALA women, just as ANAE women, were solely housewives before modernization arrived with dreams of gender equality. Agricultural and community work has always been carried out by women and men. Women are not located, but constructed in the frame of the family (Mohanty, 1991b, p. 61).

The degree to which women are involved in work outside the home is of course highly differentiated. Some cultures are stricter about women not moving freely. It is also a matter of social class.

As has been discussed earlier, gender in itself has many different meanings and consequences (e.g. Ogundipe-Leslie, 1994, p. 13f). Even motherhood and wifehood have different meanings, although the practicalities are alike. Mothering is high-status work in many cultures, while it is seen as a hindrance in much of ANAE. Among the Namaqua Khoekhoe in northwestern South Africa, feminist archaeology research describes how women exerted power through "their monopolization of the domestic economy" (Webley, 1997, p. 178). This interpretation is rather far from the general assumption that household work is oppressive and something you would rather not do, and it forces us to see our own perceptions as constructed and situated rather than universal.

As ANAE natives, we like to think of the spread of ANAE practices as liberating. There are, however, examples of how gender hierarchies have become more oppressive under ANAE influence. Colonialism took place during a period when the gender structure in ANAE was highly patriarchal, and the Victorian woman ideal was transferred to AALA by missionaries and colonial rulers. Archer (1995, pp. 7-10) has described how this has affected the people of Namaqualand in northwestern South Africa. The Nama pastoralists whose descendants still inhabit the area moved onto the land around 2000 years ago. Reports from late 1800 and early 1900 tell of women being, if not equal to men, at least comparatively autonomous and with say in household decisions. The status of the Nama women is evident e.g. in the fact that they were the only ones who were allowed to milk the cows. It is of course difficult to judge what this means, considering it was reported by European men living in a highly patriarchal context themselves. Carsten's modest conclusion is that:

it is not true to say that a wife occupies an inferior status in the elementary family, but it does not follow that a husband and a wife are equal. Since each occupies a different status husbands and wives are complementary (quoted in Archer, 1995, p. 8).

While avoiding romanticizing traditional life, which in many ways is very hard and with little freedom of choice, generalizations about the powerlessness of women should also be avoided. Rather than assuming certain power relations, we should ask how women and men communicate their needs and wishes to each other, and who is able to take action to realize those needs and wishes.

### GLOBALIZED LOCAL TRADITIONS

“It is particularly hard for Westerners to see themselves as indigenous subjects” (Haraway, 1997, p. 139). I think we must learn from writers with frameworks of understanding other than the ANAE tradition to see what in our tradition of thought is located and what can be considered universal. Much of what is today seen as universal in fact belongs to a “globalized local tradition” (Shiva, 1993a, p. 10). One of these globalized local traditions is dichotomous thinking. Although feminists claim one of their priorities is to overcome dichotomous thinking, dichotomies are supposed to be inherent in “traditional thought”, i.e. all existing cultures. Chinese thinking, for example, shows that male and female are not seen as dichotomous or poles, but as complementary, as in the Yin and Yang figure (Li, 1993, p. 274).

One should not conclude from this that gender hierarchies were not present in pre-colonial AALA or among indigenous people in ANAE, but “colonialism has brought out the basic sexist tendencies in precapitalist Africa. It has calcified existing ones and introduced others” (Ogundipe-Leslie, 1994, p. 30). Arnfred (1996, p. 13f) provides an explanation for this, based on experiences from Denmark and Mozambique. She claims that the spread of the market economy has had negative impacts on the status of women in favour of men. The division between productive work, given a monetary value, and reproductive work has become wider and more distinct. What cannot be valued in monetary terms becomes invisible, and this has meant that women’s responsibilities and work are devalued as they are done in the reproductive sphere. Arnfred emphasizes the difference between the fact that women and men do different things and have different responsibilities, which is contested but not automatically value laden, and the hierarchization of these different responsibilities. As Shiva (1995, p. 199) writes, not even “value” is a neutral term; it too is value-laden.

Regardless of the difficulty of valuing the gender relations in absolute terms among Namaqualand pastoralists as described above, it is possible to follow the changes that have occurred. The first white people who arrived in Namaqualand were “trekboere” (moving farmers), who occupied land for their farming, but did not interfere in many other ways with the pastoralists. However, missionaries began to move in with the ambition of establishing more permanent settlements among the nomadic Nama people. The definitions of distinct male and female characteristics and responsibilities present in the missionary families began to spread among the Nama people. During a general deterioration of the Nama people’s lives, women lost more than men

in the interaction with the white immigrants. One major change was that rights to land and other resources were given to men, in accordance with the Victorian notion of gender constitution (Archer, 1995, pp. 7-12). The change in power over land and decision-making was not a mere transfer from female individuals or households to male individuals. It was a deeper change in the perception of ownership and “power over” someone or something. Traditionally, land was not considered an item accessible for ownership. In Haraway’s (1997, 139) words, “holding land is a question of ‘situated knowledges’”.

For many indigenous ANAE middle class members, it takes a huge effort to realize that we belong to a marked category of people. We are used to thinking of ourselves as the norm, and it is extremely hard to recognize that our traditions are local although globalized.

### THE TRAP

Feminists in AALA balance on a very narrow ledge between two ignorant and opposite groups to which they partly belong. On the one side is “Feminism”, i.e. ANAE-based feminism, which is ignorant of ethnic inequalities and the specific needs that result from the AALA situation. ANAE feminists often expect AALA feminism to join their struggle, based on their analysis of their own realities. In some situations, this may even mean a struggle against the interests of AALA women (or AALA people).

On the other side, there are AALA men, who fight against ethnic discrimination, and who expect AALA women to join them in their struggle without caring for specific women’s interests until the “important” issues have been solved. These men often blame ANAE feminists for racism and condemn feminism altogether on that ground. A frequent argument is that “African women do not need liberation or feminism because they have never been in bondage” (Ogundipe-Leslie, 1994, p. 214), and they do not easily see that AALA women may develop another feminism that is much needed, that recognizes differences between AALA men and women, but that does not ignore ethnic hierarchies. Similar tensions have been recognized where class has been seen as primary to gender in different power struggles in ANAE as well as AALA.

Another paradox for AALA feminists is the common picture of AALA women as poor, rural, illiterate victims. It is as if it is neither exotic enough nor normal enough to be an urban academic feminist of AALA descent.

Just as feminist studies are still seen as a special branch of different disciplines, mainly of interest to feminist research but not so much to the disciplinary canon, AALA feminism is treated as a special interest rather than a highly relevant contribution to feminist theory in general (Mulinari, 1996, p. 91).

### ECOFEMINISM

The basis for ecofeminism is the recognition of the interrelated so-called twin domination or oppression of women and nature, which is described by, among others, Merchant in *The Death of Nature* (1980). It should be noted that it is the subordinate

position that is shared, and not some inherent qualities in nature and in women. Shiva (1993b) adds AALA to what she calls the three colonizations.

First, there was colonization of nature. Life-enhancing processes were exploited for capital flows. Second, woman was colonized as she was transformed from a partner into a “second” sex. Third, all “other” cultures, i.e. cultures and people in AALA, were colonized during the scientific and industrial revolution to provide raw material, exotic foods and labour. With the recognition of these interrelated oppressive structures, the prevalent development paradigm becomes highly problematic. As Shiva describes in her identification of the three colonizations, it is not possible to achieve what is defined as development without increasing the pressure on or oppression of certain groups of people or nature. Indeed, Shiva argues that development is only possible when de-development takes place at the same time. Therefore, the aim for AALA is not to catch up, but for societies in AALA *and* ANAE to transform into societies where everyone – men and women, white and coloured people – can participate and decide over their lives without oppressing each other or increasing the pressure on nature (Mies and Shiva, 1993).

It seems appropriate to address these three colonizations in relation. Experiences in AALA contexts make the connection between human survival and nature inevitable. To include environmental sustainability in feminist aims does not of course imply that this is only a feminist interest. Rather, it provides feminists with different backgrounds and experiences with yet another reason to take part in trying out new transformations.

### DEEP FEMINISM

No. Men are not the enemy. The enemy is the total societal structure, which is a jumble of neo-colonial, and feudalistic, even slave-holding structures and social attitudes. (...) As women’s liberation is but an aspect of the need to liberate the total society from dehumanization and the loss of fundamental human rights, it is the social system that must change (Ogundipe-Leslie, 1994, p. 82).

“Deep feminism” borrows understandings from deep ecology as defined by Næss (1973). An important distinction between shallow and deep ecology is that in the latter, not only the concern for negative human impact on the environment is important; at stake are also local democracy and equal distribution of resources, as well as diversity and symbiosis among humans and in nature. According to Næss’s definition, shallow ecology looks for solutions in isolation, which may solve the problem locally and in the short-term but with (probable) negative effects later or in other places. Deep ecology emphasizes the interconnectedness between different parts of the world, different knowledges and value systems, and demands a more thorough change of lifestyle to reach social and ecological sustainability.<sup>5</sup>

---

<sup>5</sup> I do not agree with Næss’ analysis in all parts. For example, he has completely ignored the existence of gender, and his ambitions for humanity to return to small, local societies seem unrealistic and not necessarily liberating. However, his critique of short-term, technological definitions of development is interesting.

With deep feminism, I want to stress that the feminist goal must be set higher than equality between women and men here and now. The feminist goal is ultimately that hierarchies are overcome, between women and men as well as between ethnic groups and classes. A more modest hope is that we at least become accountable for the hierarchies in which we are trying transformations (Trojer and Gulbrandsen, 1996). With such ambitions, it is not possible to argue that some “elite women” could reach more equal gender relations through the invisible support in their homes by people from other classes. Likewise, ANAE women cannot rely on medical experiments among AALA people for their reproductive freedom of choice or on low-paid plantation workers for cheap clothing that seems to be taken as a basic human right in ANAE. Nature or the environment cannot be exploited for the benefit of humans in the long term.

In brief, deep feminism requires that no groups be played out against each other. One group will not be freer at the expense of another. Feminists must include the liberation of all people in their feminist struggle. Just as men are expected to be interested in women’s freedom, and to be willing to admit women to decision-making structures, we must all make room for all people that we can and cannot imagine.

With this understanding, I would conclude that “the signifier *woman* is no longer sufficient as the foundational stone of the feminist project” (Braidotti, 1994, p. 105), although this statement brings us out on to thin ice once more. With the rejection of Universal Woman or Third World Woman, feminists in the 1990s are instead invited by Braidotti (1994, p. 104f) to “replace naive belief in global sisterhood ... with a new kind of politics, based on temporary and mobile coalitions and therefore on *affinity*”.

Basing a liberating practice in AALA feminism has several advantages, as the multiple and intertwined hierarchies become very visible in this context. For many feminists located in AALA contexts, it is problematic to think of feminism as an academic discipline without any connection to a political struggle (Katz, 1996, p. 171). Research *is* politics<sup>6</sup>, and feminist research should not pretend to be distanced from politics or society.

## DIVERSE FEMINISMS

There are many disagreements between different feminisms. A detailed examination of the different feminist theories is beyond the scope of this paper. However, it is necessary to recognize the fact that there are different approaches, which in some aspects are contradictory. In this context, the main interest is to note that AALA feminists spend much energy positioning themselves in contrast to ANAE feminism. Manathoko (1992, p. 73) argues that the most common in AALA is liberal feminism, which is situated within the mainstream development paradigm and which has as its primary aim to make space for women too, in mainstream development. The *direction* of the development is not subject to much debate (Mbilinyi, 1992, p. 48).

---

<sup>6</sup> It is interesting to note that a Minister of Education and Research, Carl Tham in the Swedish Government 1994-1998, explicitly stated that researchers are ‘influential and thus political’. His speech to the Swedish Research Council is quoted in Trojer (1999).

According to Mulinari (1996, p. 87), poststructuralism is not very popular among AALA feminists. This should not be interpreted simply as the virtues of poststructuralism not yet having been discovered by AALA feminists. A problem with poststructuralism or postmodernism<sup>7</sup> as Mulinari sees it is that it has identified Modernity as *the* discourse to relate to and deconstruct. This origin is confirmed by Simonsen (1996, p. 41), who defines poststructuralism as critical strategies developed in relation to the Western metaphysical tradition. As Mulinari points out, AALA feminists do not necessarily have Modernity as their point of departure, and their realities are not shaped by the same modernism or positivist science tradition as in ANAE.

For me, who does position myself against modernism and positivism, it is delicate to claim that poststructuralism might nevertheless be of interest in AALA contexts. However, my parallel reading of a number of AALA feminists and a few ANAE poststructuralist feminists reveals several connection points, where mutual exchange would strengthen both. The origin of poststructuralism ought not to hinder the use of its bearing structures in the analysis of situated realities and in the continuous development of theories and action.

An example of the common grounds is in the redefinition of the constructedness of reality. From an AALA perspective:

the biological given cannot be wished away, and they matter a lot in neo-colonial situations where disease and death are everyday matters. At the same time, their meaning is not “given” and their roots are socially and historically derived. Many of the causes of ill health and high infant, child and maternal mortality rates (...) are socially constructed, rooted in imperial/class relations (Mbilyini, 1992, p. 49f).

A poststructuralist way to express the same standpoint is that:

claiming that the discourses constitute materialism and reality is not the same as saying that reality does not exist. It means, however, that it does not exist as a spontaneous, self-induced, unchanging unit. Which does not make reality less real! We cannot choose to renounce it (Simonsen, 1996, p. 44; my translation).

An additional explanation given by Mulinari for the reluctance to make use of postmodernism is that feminists combining theoretical analysis with activism do not find support for their political standpoints in poststructuralism. There is a fear that the argument against objectivity and universal truths means that all is relative and nothing is more “correct” than anything else. Arguments become weakened by relativism, and postmodernism in itself is often expected to be apolitical (Mulinari, 1996, p. 87). If this is so, the political struggle, so tightly bound to feminist thought for many feminists, finds no comfort in this theoretical school.

---

<sup>7</sup> I will not attempt to present a comparison of poststructuralism and postmodernism. My use of poststructuralism in this text refers to e.g. Simonsen (1996) and Mörtberg (1997), while Mulinari has written about postmodernism. Hence the appearance of both concepts at this point.



The interpretation of poststructuralism as relativist and apolitical is however not the only alternative. Haraway has put much effort into showing how the feminist critique of positivism in fact increases the urge for responsible priorities and actions, carrying an appeal for participation in politics. The alternative to positivism is not relativism, as “relativism is the perfect mirror twin of totalization in the ideologies of objectivity; both deny the stakes of location, embodiment, and partial perspective. ... The issue in politically engaged attacks on various empiricisms, reductionisms, or other versions of scientific authority should not be relativism, but location” (Haraway, 1991, pp. 191, 194). Being located is to be understood not necessarily as being local, but being partial and situated. “Location is also partial in the sense of being *for* some worlds and not others” (Haraway, 1997, pp. 121, 37).

Rather than reflection (mirroring) of objectivism into relativism, Haraway (1997, p. 16) argues for diffraction as “an optical metaphor for the effort to make a difference in the world”. If this understanding of poststructuralism is applied, the gap between academic theories and political activism is overcome altogether, and we are invited to become highly responsible in our academic work.

Nevertheless, I can understand the feeling of distance between AALA feminist writers struggling with questions of population control, ethnic discrimination and the survival of rural poor, and recent writings by ANAE feminists discussing cyberspace or the history of natural science as it developed in ANAE some centuries ago. This frustration is evident in Shiva’s (1997) critique of what she calls “technofeminism”. Her argument is that technofeminists situate themselves within science and technology and do not pay attention to the realities and knowledges of women outside institutions who struggle in their ways for a better life. I do not think it is necessary to choose one or the other, and in my work as a scholar I wish to communicate with technicians as well as other people with other knowledges. It is necessary to identify bridges between useful insights derived in either location or context.

## THEORY IN PRACTICE

If it is difficult to reach understandings between feminist theorists, what will then happen when the theories are applied in practical situations? Although gender is usually integrated in development projects in some way, the contributions from feminist theory are rarely allowed to guide the design of the projects. This has caused problems in cases when women whose time and energy is already scarce as a result of household and subsistence work are further burdened by employment in labour-intensive aid projects, or when women’s only meeting point is removed because the village water well is replaced by yard taps.

Of course, the application of theory in practice cannot be generalized, although there are certain common points of departure. In this paper, I try to understand what the theories discussed above can mean in the case of rural water supply and sanitation in a Coloured community in Namaqualand in South Africa.

The location of the case study is an unregistered settlement, with 300 inhabitants who have been living in improvised homes for 20 years, whilst waiting for legal access to the land. After the democratization of the country in 1994, a local action council has

taken a leading role in applying for land rights, funds for improved water supply, connection to an electricity grid, and introduction of sanitary toilets for all homes.

Although the situation facing an unregistered settlement is insecure and inhibits initiatives among the inhabitants, it has also provided room for negotiations over gender that have been of benefit for the community. There is no obvious head of household who has signed up for the plot and the house. Very few people own cattle, as access to pasture land has been restricted, and one of the main sources of income is wage labour at tomato farms in the vicinity. This work is open to both women and men, and whatever money is brought home is spent by the whole family.

As described above, the arrival of white people in Namaqualand turned out to have a greater negative impact on women's lives than on men's. In areas where special reserves have been established for the Coloured population in Namaqualand<sup>8</sup>, men have been able to continue the semi-nomadic lifestyle of goat herding, while women have become housewives who see their children to school every morning. However, in the studied community, the nomadic lifestyle has been abandoned, and most inhabitants stay permanently in the village.

While women in traditional goat herding communities are the only ones around to care for water supply and maintenance of toilets, in this community the division of this work is different in each household. If the woman is at work, the man collects water. Men also collect water for old relatives and together with women and children they search to fulfil the water needs in the households. "*Ons werk saam*" ("We work together") was one comment during interviews. In addition to practical work, women took part in decisions regarding investments in the household. For example, most of the toilets in the community were built on the initiative of the women in the different households.

It is my interpretation that the labour situation in this community has had an influence on the gendering of household matters as well. The community was created by farm workers who moved to the present ground to bring their children closer to the new school. Hierarchies that develop over the generations between well-off and poor are present but less firm due to their short history. Also, the closeness to a white community has of course had an effect on the internal relations in the Coloured community. Unequal ethnic relations seem to be of more concern than gender relations within the community.

As far as I can see, the value of work differs from what might be expected from an ANAE perspective. It is of course better to have a paid job than not, but more for economic reasons than status. In the household, carrying water is not thought of as low status or as "women's work". As one man commented on the gendering of tasks, "we don't think about it, we just do it". This contrasts with men in Sukumaland in Tanzania, for example, who argue that it is a woman's duty to collect water and that men would only help with this occasionally when the woman was ill (Drangert, 1993, pp. 201-221).

In summary, the community where my case study took place has exemplified what many theorists have brought into light. Although the men are in the majority at

---

<sup>8</sup> The Namaqualand reserves for Coloured people are not to be compared with the South African homelands for black people. In some ways, they have provided a refuge for the Coloured population to continue with their traditional ways of life (Archer, 1995: p. 9).

community meetings, the women are not passive, but play an active and relatively independent role in the household. In a community with access to few official institutions, power and duties on the household level have not been devalued to the same extent as in a society where such institutions are present and powerful. The Coloured community of the present study has been forced to renegotiate their gender relations, due to the loss of their pastureland and their common experiences of wage work at white farms.

They are also aware of the new possibilities entailed by the new government and expect assistance to work for changes in material standard. The local action council, sharing the experiences of that specific location, has a major role to play in guiding the development of the community in economically and environmentally sustainable ways.

### CONCLUDING REMARKS

AALA feminists have focused much of their efforts on situating themselves in theory and practice in relation to ANAE feminists by emphasizing the necessity of recognizing diversity among women. This has given priority to problematization of a web of hierarchies. It has also provided further arguments for the feminist desire to do away with dichotomous thinking, which has made possible the creation of resistant hierarchies. This is also an important ingredient in poststructuralist feminist writing in ANAE.

With my understanding of the poststructuralist feminist argument for the situatedness of all knowledges, I find support for the ambitions to develop water and sanitation technologies that are appropriate, not only from health or environmental perspectives, but from the perspectives of local knowledge systems as well. While gender awareness has been included in many recent water and sanitation projects in AALA, it is my hope that a more thorough gender analysis, based on feminist theory, is employed. This paper is a first attempt to bring into the light feminist theory that could be useful in such an analysis.

### REFERENCES

- Archer, Fiona** (1995) "A Woman's Work is only Recognised when it is not done". *Women, Land Tenure and Land Reform in Namaqualand's Coloured Rural Reserves*. Cape Town: Surplus People Project.
- Arnfred, Signe** (1996) "Pengerne eller livet? Feministiske forskningsnoter med afsæt i Afrika" [The money or the life? Feminist research notes with a starting point in Africa]. *Kvinder, Køn & Forskning* Vol. 5, No. 4, pp. 5-20.
- Braidotti, Rosi** (1994) *Nomadic Subjects. Embodiment and Sexual Difference in Contemporary Feminist Theory*. New York: Columbia University Press.
- de Beauvoir, Simone** (1952) *The Second Sex*. New York: Alfred A. Knopf (1957).
- Drangert, Jan-Olof** (1993) *Who Cares About Water? Household Water Development in Sukumaland, Tanzania*. Linköping: Linköping University Dissertation.
- Haraway, Donna** (1991) *Simians, Cyborgs, and Women*. London: Free Association Books.

- Haraway, Donna** (1997) *Modest\_Witness@Second\_Millennium.FemaleMan©\_Meets\_OncoMouse™*. New York: Routledge.
- Johnsson-Odim, Cheryl** (1991) "Common themes, different contexts. Third World women and feminism", in Chandra Talpade Mohanty, Ann Russo and Lourdes Torres (eds) *Third World Women and the Politics of Feminism*. Bloomington and Indianapolis: Indiana University Press, pp. 314-327.
- Katz, Cindi** (1996) "The expeditions of conjurers: Ethnography, power, and pretense", in Diane Woolf (ed.) *Feminist Dilemmas in Fieldwork*. Colorado: Westview Press, pp. 170-184.
- Li, Huey-li** (1993) "A cross-cultural critique of ecofeminism", in Greta Gaard (ed.) *Ecofeminism. Women, Animals, Nature*. Philadelphia: Temple University Press, pp. 272-294.
- Mannathoko, Changu** (1992) "Feminist theories and the study of gender issues in Southern Africa", in Ruth Meena (ed.) *Gender in Southern Africa. Conceptual and Theoretical Issues*. Harare: SAPES Books, pp. 71-91.
- Mbilinyi, Marjorie** (1992) "Research methodologies in gender issues", in Ruth Meena (ed.) *Gender in Southern Africa. Conceptual and Theoretical Issues*. Harare: SAPES Books, pp. 31-70.
- Meena, Ruth** (1992) "Gender research/studies in Southern Africa: An overview", in Ruth Meena (ed.) *Gender in Southern Africa. Conceptual and Theoretical Issues*. Harare: SAPES Books, pp. 1-30.
- Merchant, Carolyn** (1980) *The Death of Nature*. San Francisco: Harper & Row.
- Mies, Maria and Shiva, Vandana** (1993) *Ecofeminism*. London: Zed Books and Halifax: Fernwood.
- Mohanty, Chandra Talpade** (1991a) "Introduction: Cartographies of struggle: Third World women and the politics of feminism", in Chandra Talpade Mohanty, Ann Russo and Lourdes Torres (eds) *Third World Women and the Politics of Feminism*. Bloomington and Indianapolis: Indiana University Press, pp. 1-47.
- Mohanty, Chandra Talpade** (1991b) "Under Western Eyes. Feminist Scholarship and Colonial Discourses", in Chandra Talpade Mohanty, Ann Russo and Lourdes Torres (eds) *Third World Women and the Politics of Feminism*. Bloomington and Indianapolis: Indiana University Press, pp. 51-80.
- Mulinari, Diana** (1996) "'Third World Women' difference and Domination", *Kvinder, Køn & Forskning* Vol. 5, No. 4, pp. 80-98.
- Mörtberg, Christina** (1997) "Det beror på att man är kvinna..." *Gränsvandrerskor formas och förnar informationsteknologi* ['It's because one is a woman...' Transgressors are shaped and shape information technology]. Luleå: Luleå University of Technology Dissertation.
- Næss, Arne** (1973) *Ekologi, Samhälle och Livsstil* [Ecology, Society and Lifestyle]. Stockholm: LTs förlag (reprinted 1981).
- Ogundipe-Leslie, Molar** (1994) *Recreating Ourselves: African Women & Critical Transformations*. New Jersey: African World Press, Inc.
- Russo, Ann** (1991) "'We cannot live without our lives.' White women, antiracism, and feminism", in Chandra Talpade Mohanty, Ann Russo and Lourdes Torres

- (eds) *Third World Women and the Politics of Feminism*. Bloomington and Indianapolis: Indiana University Press, pp. 297-313.
- Shiebinger, Londa** (1993) *Nature's Body. Sexual Politics and the Making of Modern Science*. London: Pandora.
- Shiva, Vandana** (1993a) *Monocultures of the Mind*. London: Zed Books and Penang: Third World Network.
- Shiva, Vandana** (1993b) "Vetenskap, teknik och 500 år av kolonisationer" [Science, technology and 500 years of colonization], *VEST Tidskrift för Vetenskapsstudier* Vol. 8, No. 2, pp. 3-16.
- Shiva, Vandana** (1995) "Biotechnological development and the conservation of biodiversity", in Shiva, Vandana and Moser, Ingun (eds), *Biopolitics. A Feminist and Ecological Reader on Biotechnology*. London and New Jersey: Zed Books Ltd. and Penang: Third World Network, pp. 193-213.
- Shiva, Vandana** (1997) *The Sacred Cow and the Mad Cow: Metaphors of Ecofeminism and Technofeminism*, unpublished lecture manuscript.
- Simonsen, Dorte Gert** (1996) "Som et stykke vådt sæbe mellem fedte fingre. Køn og poststrukturalistiske strategier" [Like a piece of wet soap in the hand. Gender and poststructuralist strategies], *Kvinder, Køn & Forskning* Vol. 5, No. 2, pp. 29-50.
- Trojer, Lena and Gulbrandsen, Elisabeth** (1996) "Authority in transformation", *The European Journal of Women's Studies* Vol. 3, No. 2, pp. 131-147.
- Trojer, Lena** (1999) "When gender is on the agenda: Reflections on technoscientific and research politics", *Contemporary Politics* Vol. 5, No. 2, pp. 137-152.
- Webley, Lita** (1997) "Wives and sisters. Changing gender relations among Khoe pastoralists in Namaqualand", in Lyn Wadley (ed.) *Our Gendered Past. Archaeological Studies of Gender in Southern Africa*. Johannesburg: Witwaterstand University Press, pp. 167-208.









# SITUATED PRACTICES<sup>1</sup>. FEMINIST ENGINEERING RESEARCH METHODS

## INTRODUCTION

In multidisciplinary or interdisciplinary feminist research, research methods from different traditions are adopted in order to develop the most useful knowledge. The planning of concrete empirical studies includes the choice between qualitative and quantitative methods, design of interview or questionnaire questions, selection of research participants, methods for testing and modifying technologies, etc. Before this process can begin, a more basic consideration of epistemological and methodological points of departure must take place. Definitions and ambitions for the research project must be determined. The study can be descriptive, looking for existing practices and beliefs, it can analyze consequences of different changes, or it can have more outspoken ambitions to influence development or to initiate changes according to what is found appropriate and desired.

Within feminist technoscience, where I situate myself, we are developing methods that are inspired by methods that are common in social science as well as other methods and analytical frameworks. This has caused and continues to cause confusion among people who are used to locating feminist research in social science. For example, in RALF's (1998) evaluation of the Division of Gender and Technology, it is feared that there will be methodological weaknesses as a consequence of the researchers' backgrounds in natural and technosciences.

With a background in environmental engineering and a feminist understanding of knowledge as situated (Haraway 1991), I am trying to develop the concept of feminist engineering. A fundamental part of such a technoscientific approach is the methodology. I was interested in a participatory and future-oriented research process. My empirical study was done in Vioolsdrif, situated in Namaqualand in north-west South Africa<sup>2</sup>. Together with the community members, I wanted to get involved in the practical selection and design of water supply and sanitation technologies, at a time when the development of these technical systems was supported by the South African government.

In this paper, I discuss methodological connections between feminist research and participatory research. The general discussion is exemplified with some references to my empirical study, which will be more extensively reported elsewhere.

---

<sup>1</sup> This expression is borrowed from Haraway 1997, p. 267.

<sup>2</sup> The research was financed by Sida/SAREC (the Swedish International Development Cooperation Agency/Department for Research Cooperation) and a travel grant from Nordiska Afrikainstitutet (Nordic Africa Institute).

## IMPLOSIONS

Before turning to the participatory methods that I have tried to use, I will present my feminist point of departure.

Witnessing is a collective, limited practice that depends on the constructed and never finished credibility of those who do it, all of whom are mortal, fallible, and fraught with the consequences of unconscious and disowned desires and fears. ... I want a mutated modest witness to live in worlds of technoscience, to yearn for knowledge, freedom, and justice in the world of consequential facts. I have tried to queer the self-evidence of witnessing, of experience, of the conventionally upheld and invested perceptions of clear distinctions between subject and object, especially the self-evidence of the distinction between living and dead, machine and organisms, human and nonhuman, self and other as well as of the distinction between feminist and mainstream, progressive and oppressive, local and global. Queering all or any of these distinctions depends, paradigmatically, on undoing the founding border trace of modern science – that between the technical and the political. The point is to make situated knowledges possible in order to be able to make consequential claims about the world and on each other. Such claims are rooted in a finally amodern, re-invented desire for justice and democratically crafted and lived well-being (Haraway 1997, p. 267).

This rather extensive quotation of Donna Haraway includes several implications for me as a feminist engineer researcher. First, I find a clear urge to “live in worlds of technoscience”, i.e. not to locate myself on the side of technical development work, but to remain involved and be deeply concerned with what my work means in terms of justice, freedom, accountability<sup>3</sup> and democracy. This may be less problematic to me with my experience from small-scale sanitary engineering, than to for example Martha Crouch, who quit doing genetic engineering when she found out about the consequences of her work (Crouch 1990; Haraway 1997, p. 110). It is nevertheless a challenge to find ways to work as an engineer *and* be involved in a critical diffraction<sup>4</sup> of the field in which I work.

Second, Haraway is clear on the point that we are all imperfect persons, driven by fear and desire, and that this is the basis for all our witnessing. For researchers, witnessing includes the way we choose to present research studies. In participatory research, it is stressed that “perception is always selective” (Chambers 1997, p. 57) and that it is therefore necessary to be very open and flexible in knowledge production. This should not be seen as a problem, hidden away from discussions of useful research.

Third, Haraway sees no borderline between micro entities such as subject-object or between macro entities such as science and politics. The implosion of these categories into each other means that I as a researcher am part of the study and the results.

---

<sup>3</sup> For a thorough discussion of accountability in technoscience, I refer the reader to Gulbrandsen, 1995.

<sup>4</sup> Haraway suggests diffraction as a “metaphor for the effort to make a difference in the world”, while reflection merely mirrors the original (Haraway, 1997, p. 16).

The implosion also makes it possible for me to move freely between what we are used to identifying as different disciplines. In participatory research, it is likewise recognized that it is not possible to undertake an uninterested study that is not expected to have any implications for a study subject. On the contrary, the researcher participates in the making of reality in a setting where s/he enters, just as the people participating in the study take part in creating their story to be told.

## **PARTICIPATORY AND FEMINIST RESEARCH IN COMPARISON**

I have learnt about participatory research as it is presented in PRA (participatory rural appraisal)<sup>5</sup>:

PRA can be described as a family of approaches, methods and behaviours that enable people to express and analyze the realities of their lives and conditions, to plan themselves what action to take, and to monitor and evaluate the results. (IDS 1996)

PRA as a methodology has an ambition similar to that of (certain) feminist research to create a dialogue between researcher and participants, and to influence the way communities are organized and the technologies are used. While feminist research texts are often focused on theoretical problems of representation, of power structures, etc., PRA research is more closely connected to concrete development projects, focusing on practical and hands-on work in the communities. Chambers describes the basis for PRA as the permanently provisional evolving paradigm and indicates that postmodernism and PRA are mutually reinforcing. PRA, however, is focused on “trying to do better by action more than thinking about theory” (Chambers 1997, p. 196f). It is my ambition, by linking feminist theory and participatory research methods, to do both.

This difference in focus is reflected in a difference in terminology. PRA researchers prefer to talk about gender and empowerment, while feminism and oppression are not commonly used. PRA refers to “local knowledge” or “indigenous knowledge” as a positive and clear concept. Chambers (1997, p. 205) distinguishes between local knowledge and scientific knowledge. Local knowledge is considered better in connection with what is local and observable by the eye, while scientific knowledge is good in connection with very small and very large things. Feminist researchers deal with the more dynamic and dirty concept of “situated knowledges” (Haraway 1991), which does not immediately differentiate between scientific and indigenous knowledge.

In Violdsdrif, there was a lack of knowledge on the small scale (water microbiology) and large scale (upstream pollution of the river providing drinking water), but in

---

<sup>5</sup> PRA is described e.g. by Chambers 1997, pp. 102-129. PRA has until recently been applied almost uniquely in rural African, Asian and Latin American contexts. Increasingly, its usefulness in other contexts is being recognized. With the wider use of the methodology in different contexts and for different purposes, a shift from the use of the term PRA (participatory rural appraisal) to PLA (participatory learning and action) has begun. However, PRA is still the better-known term. It should be noted that PRA is applied and described in many different ways. My understanding of the methodology is based mainly on Chambers' writings and on a post-graduate course in methods at the University of Agricultural Sciences in Sweden in June 1997.

this case, the consequences were clearly seen in the muddy water and the frequency of stomach diseases. Yet still, river water was preferred over the saline groundwater. There is knowledge of their white neighbours' water purification systems and flush toilets and of the new political commitment towards reconstruction and development for all people. These situated knowledges will be the starting point for negotiations about appropriate technological installations. My own (generalized and technoscientific) preferences for groundwater over surface water and for compost toilets are not immediately applicable in this particular situation.

With its focus on action, PRA usually addresses a community as a unit and strives for consensus. Much effort is spent to bring up the views and needs of the most vulnerable people, but there is nevertheless a risk that a consensus hides important aspects and reproduces the desires of the powerful. In particular, gender differences are easily overlooked in collective research situations, if women and men do not participate on the same premises in public meetings. In some cases, it may be necessary to bring conflicts into the light and deal with them (Crawley 1998, 29)<sup>6</sup>. Feminist studies could provide experience of how to recognize and address conflicting interests.

It is my understanding that feminist research and PRA share the same ambition to do away with unequal power relations, to upgrade knowledges gained and developed outside academic institutions and to get involved in practical activities. I therefore find a great potential in relating the two fields of research with each other. There are currently a number of PRA researchers that use gender studies as a theoretical framework. Levy (1998, p. 254) "stresses more than the basic compatibility of gender and participatory perspectives: they are essential and mutually reinforcing partners on any agenda for change".

### **ACTION AND ACADEMIC CREDITS**

In a world where so many go hungry, where cities are in decay and countryside have been devastated, where many need medical assistance they cannot afford, where the literacy gap increases between the haves and the have-nots – where, in short, access to just a few more resources could have such large effects on the lives of so many – in such a world, why should we support scientific activity defined as "pure" precisely *because* it promises no socially usable results? (Harding 1991, p. 92)

Although feminist and other critical theorists have shown how science is a social practice, alternative ways to approach research problems are still highly controversial. Being open about values or about doubts is regarded with scepticism. For example, Diane Wolf (1996, pp. xi and 3) was discouraged from publishing a paper on the dilemma facing anthropologists with power relations in the field and in representation of field research. It was said that all anthropologists experience the same conflict, but that it is inappropriate to be open about this. Still more controversial is to admit and underline

---

<sup>6</sup> Several authors in this book (*The Myth of Community*) suggest that gender awareness has been lacking in most PRA work until recently and that it is problematic to view communities as units with common interests.

that the research project has ambitions to trigger change and empowerment. The feminist struggle for transformation within science is very important and is inherent in the question of taking part in a change in society in large. However, a more general discussion is beyond the scope of this paper<sup>7</sup>.

Apart from the fact that action (or even worse: activism) is seen as a suspect ingredient in academic work, an internal conflict arises in the question of loyalty and priorities. To achieve academic success, written reports are required at defined times according to a previously established plan, with references and theoretical reasoning, and preferably in English. On the other hand, action takes time, and with engagement of research participants in the design of the study, it is difficult to plan in timing and content, and the results are mainly pictorial or oral in some less well-known local language. In feminist science, in action research and in participatory research, where the individual or group under study are considered participants with joint ownership of research results, it is difficult to fulfil the academic requirements of individual authorship. Among feminist anthropologists, however, it is argued that as long as the discipline exists and continues to present and represent different cultures and societies around the globe, and as long as these (re)presentations continue to have importance for political and economic decisions that affect these societies and cultures, there is a need for researchers who are aware of the gender aspects and who use feminist theory as their frame of understanding (Wolf, M 1996, p. 215f). In my own field of sanitary engineering, I feel the same need not to turn my back on the field but to take part in it as a feminist, as mentioned earlier.

To facilitate openness about ambitions and to clarify the meaning of participation without eroding its potential, Attwood (1997) has described four different levels of PRA research (see Table 1). The first attempt to apply PRA may be described as “extractive research using PRA tools”. “Rapid rural appraisal (RRA)” includes a potential of continued local activities. In both cases, the research is planned and controlled by the outsider researcher. PRA has a more outspoken ambition to stimulate local activity and can be initiated by an outside researcher or (preferably) by local people.

The four types, of which the fourth is often seen as the ultimate goal, should not be regarded as distinct, but rather as steps on a continuum. As Attwood points out, there are also many combinations. It may feel discouraging to realize that you have not attained all characteristics of the third or fourth level, where local people have to take much of the initiative. However, attempts to strengthen the level of participation in different stages of the research process are always worthwhile in the act of balancing between action and academic acceptability. In the research situation, where results are expected to be presented by the researcher in written form, it is still possible to be open about the focus of interviews and other research activities. It is possible to discuss different solutions to different problems as desired by the research participants and to include testing of different suggestions, rather than to fill in pre-printed questionnaires.

In a study of how women are shaped by and shape information technology, Mörtberg (1997, pp. 50-52) has described how together with a group of women

---

<sup>7</sup> For a thorough discussion of the issue, see e.g. Trojer and Gulbrandsen, 1996.

<b>What</b>	<b>Description</b>	<b>Agenda, Benefit, Control</b>	<b>Process vs. information</b>	<b>Timing</b>	<b>PRA components</b>	<b>Local empowerment</b>
Extractive research using PRA tools	Extractive information gathering using PRA tools only, with no process or potential for local follow-up.	Outsider	Only information	Short-term	Use tools only	Probably none, except for the next time outsiders want to do research <i>on</i> the community.
RRA (Rapid Rural Appraisal)	Extractive information gathering, but local follow-up is encouraged through promoting and supporting links with agencies that can engage in a process.	Outsider and hopefully spin-offs for locals	Mainly information	Short-term	Use tools mainly	Possibly some
PRA initiated by outsiders	Action-oriented development process, with information sharing, a negotiation of agendas, and changing actor and power roles, initiated by “outsiders”.	Outsider-local negotiated	Process and information	Medium-term	Use tools and philosophy within process	Hopefully some
PRA initiated by local people	Action-oriented development process guided by local agendas, actors and decision makers. Outsiders called in for specific assistance or information if and when needed.	Local	Mainly process	Long-term	Use tools within process guided by philosophy	Definitely some for some, hopefully some for all

**Table 1.** An attempt to classify the various activities that go under the name of “PRA”. From: Heidi Attwood: *Participatory Research: Ideas on the use of participatory approaches by post graduate students and others in formal learning and research institutes. IDS PRA Topic Pack. Brighton: Institute of Development Studies February 1997, p. 3.*

system developers she learnt about their situation as transgressors in working life and in family life. This learning process took place in a research circle. One finding was that the participants in the research circle gained understanding of their own and the others' thinking during the meetings, and that this was a positive experience that they wished to continue. The openness in this process is clear, but Mörtberg is also explicit about her decision not to invite the group to a collective interpretation of the material but to analyze the results in her own way.

Although I had intended to place my own study in the lower half of the diagram, Rapid Rural Appraisal is probably a more realistic description of what I achieved. However, this has not discouraged me from striving towards more participatory research situations.

### QUESTIONS OF POWER RELATIONS

Although every research situation is unique, many feminist researchers bear witness to similar dilemmas of power relations and representation. If feminist studies aim to do away with inequalities and hierarchies, how is this applied in the concrete situation? When a well-educated, comparatively well-off woman from an ANAE (Australia, North America and Europe) country chooses to study the situation of women (and/or men) in slums or poor rural communities in AALA (Africa, Asia and Latin America)<sup>1</sup>, she is in many ways placed in a high position in the local hierarchy. Some of her power derives from the fact that she is there of her own free will and is free to leave whenever she wishes. She is also the one who decides how to present the participants to the rest of the world, as she selects the topics of interviews and discussions during the field-work. She has the final say in the representation of the situation, as she is the one who summarizes her findings in a paper or thesis after leaving the field (Wolf, D 1996, p. 2). Of course, this is also valid in contexts where the researcher is native to the study area.

Analyzing and being open about the power relations in each research situation is highly important. It would be unrealistic and dishonest not to recognize that the relationship is unequal, even if there are ambitions to reduce the power imbalance. "Mutual respect of difference is essential, but this respect should not pretend an equality of power that does not exist" (Wolf, M 1996, p. 217). It may be more appropriate to consider how the power that we have as researchers can be used to benefit the people that we study. In Mörtberg's study (1997, pp. 52-56), mentioned above, an extensive discussion of the relations between researcher and research subject is provided. Her aim during interviews was to place the interviewed person in the centre and to create a dialogue between herself and the interviewed person. Nevertheless, she has recognized how she has directed the dialogue through her feminist thinking and her way of formulating her questions. She is also the one to (re)present the interviewed persons in text.

It should be noted that power is not two-dimensional with the (young), literate, middle-class, academic researcher over the poor, illiterate housewives or factory workers. This is a Western characterization of power and status, while in other contexts age and marital status may be regarded as more important than degree of

---

<sup>1</sup> The acronym AALA is borrowed from Ogundipe-Leslie 1994, p. 4.

education. Power is multidimensional, with interactions between many different characteristics (Wolf, D 1996, p. 39 note 6).

In the field situation, the dilemma of power relations is related to the fact that the researcher is the one who has decided to establish the relationship, and that to a large extent it is the researcher who determines what to talk about and what information they would like brought forth. Of course, it is still possible for the participants to react and take control over what is being said, as they can choose what factors they want to divulge. Their answers and involvement depends on who is asking (and what that person can be expected to contribute in exchange) and to what extent they co-operate with the researcher. It is a mutual though unequal conversation (Lal 1996, pp. 201 and 206; Chambers 1997, pp. 84-88). When the researcher returns home to write up her/his papers and thesis, the participants are no longer present in person, but only through interview transcriptions and possibly in maps and diagrams inspired by PRA. In this situation, it is only the researcher who has any say in what story will be told. Most probably, colleagues will add their opinions and comments, and in the end, it may be hard to recognize the research participants as they presented themselves. It is very easy to turn them into objects. The choice of methods for interpretation and analysis has great influence. Mörtberg (1997, pp. 59-65) moved away from categorization of the interview answers according to grounded theory, as she found that contexts were lost and ambivalences hidden away. In her case, discourse analysis provided a way of keeping tensions visible and representing persons in greater complexity.

A feminist anthropologist, Zavella (1996, pp. 150-53), has described an internal conflict when deciding whether to represent the participants from her own feminist perspective or according to the participants' own analysis of their situation. Zavella, who herself belongs to the Chicana people in Mexico, found it conflicting to present the ethnic identity of her research participants in her thesis. The name "Chicana" is used in political contexts, and Zavella's colleagues urged her to use this term, while the participants referred to themselves as Spanish or Mexican. Her final choice was to accept the words used by the participants themselves.

Similar dilemmas may arise in the interpretation of the study context. What research participants present as liberating and progressive, the researcher may interpret as oppressive from her/his point of departure. Despite a number of anthropological studies presenting African women in different localities as strong personalities and with authority in the household sphere, I still find it more common to describe and search for "the Vulnerable African Woman". This is of course partly explained by the numerous examples of existing, problematic situations for women, but it may also have to do with Western preunderstandings of African women having the same problems as Western women, as well as a strategic interest to provide arguments for a feminist movement globally.

Women in Namaqualand (where Vioolsdrif is located) were reported to have little say in community as well as household decision-making in the mid-1990s. Their "traditional" responsibilities for the home and the children seemed to make them invisible (e.g. Archer, 1995). During my stay in Vioolsdrif, this generalized picture of the African woman and in particular the women in Namaqualand was dismissed. The community, being a dynamic community with many migrants, constantly has to re-define what is desirable or essential for whom. Women and men work for wages to the same extent, and the responsibility for supplying the household with fuel wood and



## 2. *Situated practices*

water is distributed according to who has the time to do it. This is in contrast to ANAE expectations of male breadwinners and female homemakers carrying water long distances in AALA. Many women also explained that they were the ones to initiate the construction of toilets in their families. Apparently they were not, as is commonly expected, unable to make decisions about investments according to some tradition excluding women from power over household money. Lal (1996, p. 204) emphasizes that although we are never able to present more than a partial picture of reality, as researchers we must be open to the context in which the participants are located.

To reduce the objectification of research participants during the post-field writing work, feminist anthropologists as well as PRA practitioners suggest that the participants be given the possibility to comment on written materials before publication and be invited to comment on the discussion and conclusions given. There are many practical obstacles to this. The place may be far away, time may not be of the essence, and there are probably scant financial resources available for follow-up visits. The texts may be written in a language foreign to the participants, allowing only literate persons with knowledge of the relevant language to read the material. The mail and telephone systems may delay communication until the material is no longer accurate. But in cases where these obstacles have been overcome and the researcher has received comments or their texts, the participants have often not recognized their stories or find the presentation distorts their reality (Wolf, D 1996, p. 32). As researchers, we must be aware of this; we must not pretend that we are representing someone else but must admit that *our texts are our own constructions* (Stack, 1996, p. 106).

Gulbrandsen reminds us that it is easy to view oneself as a feminist researcher as “part of the solutions, maybe as counter-expert, that can provide research results as agendas for action for politicians and managers” (Gulbrandsen 1998, p. 51). Her hope is that we begin to recognize that we are not only part of the solutions, but part of the problems as well. Chambers’s ambition to put the first last is based on a similar reflection. “It is the beginning of wisdom to recognize that we, as professionals, are much of the problem and that they, the poorer, are much of the solution”. (Chambers 1991, p. 533)

PRA as well as feminist research has tried to do some justice to the participants through collective authorship of papers and reports. However, academia does not encourage this, as merits are individual in the present academic career system (e.g. Wolf, D 1996, p. 27; Cassara 1987). A compromise is to prepare two different reports, where one is a more traditional research paper and the other (which can be a paper, a series of posters, a meeting, or a theatre play) is directed towards the research participants and colleagues interested in alternative approaches. The content of the two must of course correspond, but the layout can be adjusted to suit the reader. If consideration of a particular case leads to suspicion that the results and the research will have negative consequences for the participants, it may become necessary to avoid publication. In other cases, the research participants may benefit more if the researcher accepts academic standards in order to be able to continue studies and publications, than if strict participatory ambitions are employed.

As mentioned, a participatory process does not immediately fit into the academic time frame. The process of introducing new sanitary systems in Vioolsdrif has only just started. Ideas and suggestions that my first short stay in the community brought up have been presented on posters prepared for the community. These posters give con-

crete examples of simple technologies to improve water quality and sanitary facilities, and they will be the basis for a discussion of what can be done, what is desired and how these things can be implemented.

## **PARTICIPATORY RESEARCH TOOLS**

PRA has been criticized for being inexact and for producing qualitative results in disciplines dominated by quantitative methods. However, PRA has developed its own principles and has shown over the years that the results it provides are at least as accurate and informative as those yielded by conventional surveys. In particular, PRA provides a situated understanding of cause–effect relations, proportions, and natural, social and economic prerequisites for desired action.

Chambers (1991, pp. 522-526) emphasizes five basic principles and practices that are used:

- Optimizing tradeoffs means knowing what is worth knowing and when enough is known.
- Offsetting biases and taking time are necessary to get to know what is not so easily revealed.
- Triangulating means that more than one method or source is used to search for the same knowledge.
- Learning directly from and with the people instead of looking through windows on the reality out there increases situated knowledge.
- Learning rapidly<sup>2</sup> and progressively. The learning process is flexible, interactive and inventive, rather than predetermined in detail from the outset.

Repeatedly, PRA practitioners emphasize that the approach is essential, while the tools are context dependent and flexible (e.g. Chambers 1997; Table 1). For many people, the first contact and the visible results of PRA are the tools. And indeed, although each PRA is unique and demands context-dependent tools and continuous adaptation during the process, there are a number of well-known examples that are often useful. Examples of different categories are secondary data review, direct observation, do-it-yourself, interviews, stories, and different visual tools like preparations of maps and calendars or ranking of alternatives in diagrams (e.g. Chambers 1997, pp. 116-119; Narayan 1996, pp. 82-95). Most important, the knowledge generated gives a potential for action where it is most urgently desired or needed, in the most appropriate way.

The methods developed in PRA have been useful in the case where I have tried to initiate a collective evaluation of present and future technologies and of the structures of power and decision-making that are at play. Listing important characteristics for a “good toilet” was one of the PRA techniques that helped to clarify priorities that

---

<sup>2</sup> “Rapidly” is to be understood in relation to anthropological studies demanding years of fieldwork. Chambers argues that it is more important to reach some results in reasonable time, while still allowing enough time to establish a dialogue.

2. Situated practices

must be met and created a possibility to collectively discuss how the priorities can be satisfied in different ways, using different technological alternatives (see Table 2).

---

I am not seen by others when I go to the toilet.  
 Don't like to go in the dry riverbed, it is not healthy.  
 Have no torch (at night).  
 Pit latrine has fewer flies than the bucket toilet.  
 Emptying the bucket in the (dry) riverbed is not good.  
 Bucket is better than nothing.  
 The pit has to be deep to avoid flies and smell.  
 All toilets need cleaning agents.

---

**Table 2.** Important characteristics of a toilet, according to three neighbours living close to the dry riverbed in Vioolsdrif, October 1997.

A table over “who does what” in the household is also very illustrative. The youth group in Vioolsdrif came up with the following table:

	Women	Men
Collect wood		
Collect water		
Repair house		
Cook		
Wash clothes		

**Table 3.** Women's and men's relative share of household work in the community in general, according to the youth group in Vioolsdrif, October 1999. The total length of the bar indicates the relative time spent on each task.

Apparently, some of the heavy household work, like gathering water and firewood, is performed by women and men together. This knowledge has implications for the decision making on both the household level and the community level.

There is also a need to relate environmental prerequisites to societal structure and people's expectations. Observation and participation in water-related activities yield information and understanding that interviews alone cannot provide. Where the groundwater is too salty to taste good, it matters little that it contains fewer bacteria than does surface water. Where neighbours have individual flush toilets, it is sensitive to advocate dry latrine systems even in a desert-like region. Acceptance of alternatives to flush toilets requires thorough discussion rather than information from outsider experts. Participatory research can provide a forum for such a discussion.

Participatory research can also, as stated above, provide platforms where participants structure their knowledges and become aware of their own potential to make choices. I brought a sample of a urine-separating unit that can be installed in a bucket latrine. It was tried, and the users found it needed certain adjustments to function better. The aim of reducing smell and cleaning needs was not fulfilled in the present installation, and the unit will have to be tested in other ways before anyone would

accept it. (The aim of testing one of many technical solutions to the sanitary problem of toilets has been to raise consciousness about the diversity of possibilities and about being able to make informed choices.) It is my hope that when government officials arrive to introduce technical solutions for improved sanitary conditions, the community members and their representatives in the local development forum will be able to put forward their suggestions and desires, rather than just accept what the government has decided for them.

### CONCLUDING REMARKS

Doing research within feminist sanitary engineering requires constant rethinking and diffraction as the project develops. The research methods need to agree with the aim to get involved in the development of technologies rather than to do an evaluation in retrospect. This in turn requires that different ways to get involved and get research participants involved be tried out.

The application of the PRA approach and methods is not uncomplicated in the research situation, but it is definitely worthwhile integrating participatory methods and attitudes as much as possible in each project. A feminist framework of understanding will, in turn, contribute to the further development of PRA, opening for a complex understanding of gender structures and for conflict management between interest groups. Also, feminist understandings of power relations and their impact on the production of knowledge are highly relevant in participatory research. There is thus a mutual interest in connecting feminist theory and PRA and finding ways to apply this research approach in practice.

### REFERENCES

- Archer, Fiona** (1995) "A Woman's Work is only recognised when it is not done". *Women, Land Tenure and Land Reform in Namaqualand's Coloured Rural Reserves*. Cape Town: Surplus People Project.
- Attwood, Heidi** (1997) *IDS PRA Topic Pack*. Brighton: Institute of Development Studies February 1997.
- Cassara, Beverly** (1987) "The how and why of preparing graduate students to carry out participatory research", *Educational Considerations* Vol. 14, No. 2-3: pp. 39-42.
- Chambers, Robert** (1991) "Shortcut and participatory methods for gaining social information for projects", in Cernea, Michael (ed.) *Putting People First. Sociological Variables in Rural Development* 2<sup>nd</sup> ed. Oxford: Oxford University Press, pp. 515-537.
- Chambers, Robert** (1997) *Whose Reality Counts? Putting the First Last*. London: IT Publications.
- Crawley, Heaven** (1998) "Living up to the empowerment claim? The potential of PRA", in Guijt, Irene and Kaul Shah, Meera (eds) *The Myth of Community. Gender Issues in Participatory Development*. London: IT Publications, pp. 24-34.

- Crouch, Martha** (1990) “Debating the responsibilities of plant scientists in the decade of the environment”, *The Plant Cell* Vol. 3, No. 4: pp. 275-277.
- Gulbrandsen, Elisabeth** (1995) *The Reality of our Fictions. Notes towards Accountability in (Techno)science*. Luleå: Luleå University of Technology Licentiate thesis 1995:20.
- Gulbrandsen, Elisabeth** (1998) “Forskningspolitiska (pr)øvelser”, *Kvinneforskning* Vol. 12, No. 1, pp. 48-61.
- Haraway, Donna** (1991) “Situated knowledges: The science question in feminism and the privilege of partial perspective”, in Haraway *Simians, cyborgs, and women*. New York: Routledge.
- Haraway, Donna** (1997) *Modest\_Witness@Second\_Millennium.FemaleMan©\_Meets\_OncoMouse™*. New York: Routledge.
- Harding, Sandra** (1991) *Whose science? Whose knowledge?* Buckingham: Open University Press.
- IDS**, (1996) *Policy Briefing Issue 7: August 1996*. Brighton: Institute of Development Studies, University of Sussex.
- Lal, Jayati** (1996) “Situating locations: The politics of self, identity, and ‘other’ in living and writing the text”, in Wolf, Diane (ed.) *Feminist dilemmas in fieldwork*. Colorado: Westview Press, pp. 185-214.
- Levy, Caren** (1998) “Institutionalization of gender through participatory practice”, in Guijt, Irene and Kaul Shah, Meera (eds) *The Myth of Community. Gender Issues in Participatory Development*. London: IT Publications, pp. 254-267.
- Mörtberg, Christina** (1997) *‘Det beror på att man är kvinna...’ Gränsvandrerarskor formas och formar informationsteknologi* [‘It’s because one is a woman...’ Transgressors are shaped and shape information technology]. Luleå: Luleå University of Technology Dissertation.
- Narayan, Deepa** (1996) *Towards Participatory Research*. Washington DC: World Bank Technical Paper Number 37.
- Ogundipe-Leslie, Molar** (1994) *Recreating Ourselves: African Women & Critical Transformations*. New Jersey: African World Press, Inc.
- RALF** (1998) *Institutionen för Arbetsvetenskap, Luleå tekniska universitet. En utvärdering genomförd på uppdrag av Rådet för arbetslivsforskning* (The Department of Human Work Science, Luleå University of Technology. An evaluation commissioned by the Swedish Council for Work Life Research).
- Stack, Carol** (1996) “Writing ethnography: Feminist critical practice”, in Wolf, Diane (ed.) *Feminist Dilemmas in Fieldwork*. Colorado: Westview Press, pp. 96-106.
- Trojer, Lena and Elisabeth Gulbrandsen** (1996) “Authority in transformation”, *The European Journal of Women’s Studies* Vol. 5, No. 2: pp. 131-147.
- Wolf, Diane** (1996) “Preface” and “Situating feminist dilemmas in fieldwork”, in Wolf, Diane (ed.) *Feminist Dilemmas in Fieldwork*. Colorado: Westview Press, pp. ix-xii; 1-55.
- Wolf, Margery** (1996) “Afterword: Musings from an old gray wolf”, in Diane Wolf (ed.) *Feminist Dilemmas in Fieldwork*. Colorado: Westview Press, pp. 215-222.

**Zavella, Patricia** (1996) "Feminist insider dilemmas: Constructing ethnic identity with Chicana informants", in Woolf, Diane (ed.) *Feminist Dilemmas in Fieldwork*. Colorado: Westview Press, pp. 138-159.







# FEMINIST SANITARY ENGINEERING IN VIOOLSDRIF, SOUTH AFRICA<sup>1</sup>

## INTRODUCTION

In the development cooperation discourse, there is a growing awareness that a gender approach is relevant, as women and men are active in different areas in society and have different gender responsibilities in households (see e.g. SIDA, 1994). In the water and sanitation sector, it is often argued that women are responsible for water supply, hygienic practices and childcare. They, therefore, express different priorities regarding the distribution of resources in general, and more specifically, new water schemes and sanitation systems. The focus on gender in development projects is important, and has meant that women's situation has been recognized. As an engineer, I recognize the importance of trying to identify ways to let a feminist understanding influence technologies in other ways than gender related interests. The feminist problematization of hierarchical and dualist thinking is also of value to the discussion of the relation between technical experts and technology users and between humans and nature.

Feminist engineering needs to address both women's practical gender interests and strategic interests<sup>2</sup>. Women's practical gender interests refer to interests that women have as women in the existing society. This can be household water provision, childcare, etc. Women's strategic interests, on the other hand, focus on empowerment and equal rights, and include the right to a personal bank account, land ownership rights, access to credit and participation in democratic forums (Molyneux, 1985). Immediate improvement of the daily work is urgently needed, and it is a strategy where results come quickly and concretely. This is where engineers most often focus their concern. These efforts, however, need to be complemented with the (more politically sensitive) struggle to reform the gender structure in society. In the development of a feminist engineering practice, it is also necessary to raise the view from individual or groups of women and men, and ask what a feminist perspective on technology could mean in the design of technologies more broadly. One aspect may be to open up the black box of technology, and include more and different actors in the development and decision-making process.

In this article, I attempt to develop a feminist way, not only to analyze existing water and sanitation technologies, but also to get involved in the planning of new

---

<sup>1</sup> I am thankful for financial support from Sida/SAREC (Swedish International Development Cooperation Agency/Department for Research Cooperation) and a travel grant from Nordiska Afrikainstitutet (Nordic Africa Institute). I also received important financial, practical and intellectual help from the Department of Earth Sciences, University of the Western Cape in Cape Town, South Africa through Rian Titus, Milicent Williams and others. The generosity shown by the people in Violsdrif, and in particular by the Action Council, has been most crucial and appreciated.

<sup>2</sup> Margaret Zwarteveen, lecturer and researcher at the Irrigation and Water Engineering Group, Department of Environmental Sciences, Wageningen University, the Netherlands, reminded me of this at a conference in Stockholm in June 2000.

technical solutions. Focusing on Vioolsdrif community in Namaqualand in north-western South Africa, I discuss how the present system has been established, and what is needed to change it. To open this black box of technology, I have taken inspiration from Corlann Gee Bush's (1983) assessment of technology within different contexts and from John Law's discussion about heterogeneous engineering (1987 and 2000). The overarching idea is to discuss possibly appropriate technologies through the identification of actors and their positions in the different contexts where negotiations over technology development take place.

## NAMAQUALAND

Namaqualand is a semi-arid to arid region in north-western South Africa. The mean annual temperature is 18-20°C, but can reach 40°C in the summer in certain places. Low bushes dominate the vegetation. Mining is an important source of income, parallel to goat grazing. Irrigation farming also exists close to perennial rivers. The population density is low, and communities are rather isolated (Deshingkar and Cinderby, 1998).

Namaqualand was inhabited some 2,000 years ago by nomadic people, who have since then kept cattle and goats in semi-nomadic grazing patterns. Farmers of Dutch origin began to move in during the 18<sup>th</sup> century, but it was Christian missionaries of European descent that first put pressure on the original inhabitants of Namaqualand to change their lifestyle and settle down in permanent settlements in the so-called "reserves" that were established. The reserves were arranged to secure land for the Coloured population, and differ from the "homelands" in that nobody was forced to live there, and they were never said to be independent states. In Namaqualand, there are six reserves. The land in the reserves was communal and allowed for continued herding, but limited the area available and thus increased the pressure on the vegetation (Archer and Meer, 1997).

Historic reports indicate that women and men in Namaqualand lived in relatively equal relationships. Women enjoyed an independent social position and were in charge of the household economy, and of milking the cows (*ibid.*). Reports by Europeans from the early 20<sup>th</sup> century show surprise over the equal gender relations among the people of Namaqualand at that time. The missionaries introduced Christian gender structures that dominated in Europe at that time, and arranged for the women of Namaqualand to stay at home with the children while the men alone were entitled to occupation and grazing rights to land outside the villages. Later, many men were recruited to work in mines and industry far away from their homes.

In the mid-1990s, the District Council (DC), which serves under the Northern Cape Provincial Government, initiated Local Development Forums (LDF) in the villages in Namaqualand. The LDF is the local group responsible for development projects, and is constituted by representatives from the different organizations in the village. Women have in the recent history of the area not been engaged in political meetings and decision making at a community or district level (Deshingkar and Cinderby, 1998). Although women are represented in the LDF through women's

### 3. Feminist Sanitary Engineering in Vioosdrif

groups, they are not necessarily given the opportunity to influence the LDF<sup>3</sup>. Mariana Beukes reported, however, that a change in the representation has started, and that women's substantial participation in the decision making bodies is increasing (personal communication, November 1999). For example, she was one of two councillors reporting from her local authority to the DC. In her own home village, land rights for the plots in the village were given to couples rather than to a (male) head of household, in the case of a couple living together. Beukes' explanation was that the people have made use of the new Constitution (1996) and the Reconstruction and Development Programme (1994) which acknowledge the existing sexism in society, and aim explicitly at gender equality.

#### VIOOLSDRIF

Vioolsdrif is a community in northern Namaqualand on the Namibian border. Vioolsdrif is situated outside the reserves, and the population is mixed, although the commercial farmers of Dutch origin live separated from the main community. Goat herding was made impossible when the white farmers limited the access to land and water. The sources of income are, therefore, varied and dependent on external employment offers. Water from the Orange River is used for the domestic water supply, and few households have access to a toilet of any kind. The community was selected for the study as the LDF leaders showed an interest in the study, and as it complemented a related project at the University of the Western Cape (UWC).<sup>4</sup>

The present location was inhabited around 1976, when the primary school for the farm workers' children was built. Many families moved from their homes on the different farms to live in a community at this site – around 300 persons in 1999. The employment rate is low; less than 50 per cent of the men over 18 years and just over 25 per cent of the women have some kind of employment (Vioolsdrif Opname, 1996). About half of the male workers work in mines, while the women mainly work at the commercial farms. Both mining and farm work are seasonal, largely unregulated and insecure forms of employment. Alcohol and drug abuse is common among both women and men.

In some villages, the commercial farmers are involved in the LDF, but in Vioolsdrif, they have decided not to participate in the LDF, and the inhabitants in the main community have initiated a parallel Action Council to work specifically on their problems (interview, 1997).

The village is placed on three ledges at different levels on a rocky hillside, where the low ledge is close to a dry river-bed, and the steep hill rises behind the high ledge. The topsoil is thin and broken, with the solid rock showing through in large areas. The

---

<sup>3</sup> Milicent Williams, a student at UWC (see note 1 and 3), gave this record in 1997 from two different villages within two reserves in Namaqualand.

<sup>4</sup> At the Department of Earth Sciences at UWC (University of the Western Cape), a multidisciplinary group studied groundwater chemistry, water-related socio-economic conditions in two traditional, rural communities, and produced a GIS application over water chemistry related diseases in Namaqualand. The study, running from 1996-2000 is called 'Groundwater assessment and strategy for Western Karoo, Namaqualand and Bushmanland' (Pietersen et al., 1996).

national road N7 passes between the river and the village, and the distance to the border post to Namibia and the bridge over the Orange River is a few hundred meters. The village is stretched along the ledges, with the school in the far end and the LDF office closest to the road.

The piece of land where Vioolsdrif is presently located belongs to the DC, and the LDF is preparing the registration of a legal settlement. Only when this is done, will individual households be able to get their land plots registered as private property on which they may then build their houses. A middle-aged woman said: *“Al wat ek verlang, is om my eie grond te hê”* (“All that I long for is to get my own land plot”, interview, 1999). This is a major obligatory point of passage in the efforts to supply domestic water and improved sanitation. Few seem to be interested in investing in construction before the individual plots are registered. And, when the plots are registered, *“Die eerste probleem is die huis te kry, dan kan ons toilet kry.”* (“The first problem is to get a house, then we can get a toilet”, interview with an old woman, 1997).

The DC is the authority responsible for information and subsidy arrangements for construction and legal rights. An NGO called Surplus People Project (SPP) has supported Vioolsdrif in the efforts to register land and start development projects. Some people in Vioolsdrif have been disappointed with the DC, as they were not active enough in the process of land registration and other projects (interviews 1997 and 1999). At the DC, on the other hand, the attitude has been to wait for communities to contact them (interviews at DC, 1997 and 1999). The initiative was supposed to come from the Local Development Forum.

Being a young community, there is migration both in and out of Vioolsdrif. Together with the present work situation, this has resulted in a dynamic community, where the gender structure is renegotiated consciously and unconsciously. Interviews showed that some of the household work was clearly gendered, like cooking, washing and repairing the house. Other work, like fetching water, collecting firewood and cleaning the toilets, was shared in many households, while in others, these tasks were done by the woman or the man, partly depending on the work situation in each household. The latter is in contrast to other research in Africa and elsewhere, where, for example, domestic water supply is mainly seen as a woman’s work (e.g. SIDA, 1994). In Figure 1, the division in one particular household, according to an interview 1997 is presented. The decision making was shared in the household, even when the work was divided. When asked about conflicting interests, one young woman claimed, *“Ons staan saam in die huis. Dis nie ‘n probleem nie”* (“We stand together in the house. That is not a problem”, interview, 1997).

<i>What the man does</i>	<i>What the woman does</i>
Clean toilet	Clean toilet
Take care of solid waste	Clean the house
Collect firewood	Wash the laundry
Collect water	Bake bread and do ironing
Take care of the doves	Cook
Keep the house in order	Feed doves
	Water plants

**Figure 1.** Gender division of household tasks in one household. From interview, 1997.

### 3. Feminist Sanitary Engineering in Vioosdrif

In 1997, observation and interviews indicated that women only participated to a limited extent in the community decision-making. In 1999, the opposite was found, and the community leaders were trying to get more men involved. The chairperson of the LDF was a woman. More men than women were made passive by drugs and alcohol abuse, but Beukes (my research partner in Namaqualand) also argued that women have put the strong gender equity writings in the new Constitution to practice in Namaqualand in general. Sue Power, a project worker at SPP, thought that the women in new and non-traditional communities like Vioosdrif found it easier to take the initiative, than women in more traditional villages in Namaqualand (personal communication, November 1997).

#### FEMINIST ENGINEERING

According to Bush (1983), a feminist technology assessment should cover the design and development context, the user context, the environmental context and the cultural context, where the latter three are concerned with the consequences that a technology has when it is taken in use. Morgall (1991) would also like to add the socio-economic context, including social and material factors that influence development, dissemination and end-user conditions. In this case, the socio-economic factors are combined with the cultural, as they are closely related.

In Bush's model, gender is mentioned in the user and cultural context, as gender interests and relations are influenced by technological change. Bush has been criticized by Morgall (1991) for not attempting to address gender within the design and development context, but only when the technology is developed and ready to be put to use. Further, she criticizes the consequential phenomenon in feminist research, which is to focus on the user context and neglect the design and development context, viewing it as a black box out of the reach of non-experts. As I see it, *design and development* is the overarching context which, in turn, includes engineering, users, environmental, cultural and socio-economic considerations.

As Morgall argued, feminist studies often regard technology development as a black box. The consequence is that feminist reactions on the applications and uses of technology only become possible after the technology is taken into use. Feminist studies situated within technoscience (Haraway, 1997) develop possibilities for feminist involvement in design and development that go beyond the more prevalent feminist studies in social science (for a discussion of feminist engineering, see Rydhagen, 1999).

In order to define feminist engineering in relation to the case of Vioosdrif, I have found it useful to consider the concept of heterogeneous engineering (Law, 1987). Heterogeneous engineering implies that different human and non-human actors, including the end-users, the environment, technical infrastructure, the engineers, social factors, and other artifacts participate in the design and development of a technology. Successful heterogeneous engineering is difficult, as the different actors may resist in different ways, and conflicts must be overcome. Users and engineers must agree on what is desired, and the knowledge of how natural resources behave is necessary to succeed. The outcome of negotiations concerning water and technology management determines the design.

The “principle of symmetry” emphasizes that the heterogeneous *engineer* is “not in principle analytically privileged” (ibid.: p. 132). All actors are discussed with the same terminology, are expected to participate in the design and development under the same conditions, and are supposed to have the same influence on the outcome of the negotiations. Although Law applies the principle of symmetry in his historic analyses, I do not find that it is actually valid in most design and development practices today. In the development of a feminist engineering practice, I argue that symmetry between the engineer and user, the environment and the financial, social, and cultural situation is desirable. And, this is an important divergence from the established practice of “expert rule” in technology design and development.

In the following, I will identify actors and important activities in the heterogeneous water and sanitation engineering in Vioolsdrif in the different sub-contexts that I find important for the design and development process (modified from Bush, 1983):

- *The engineering context*, including tools and techniques used, engineers, technology system and infrastructure, tasks to be performed and specific problems to be solved;
- *the user context*, including the techniques in use, motivation and personal advantage, responsibility for maintenance, and adjustment to and appropriation of the new technology;
- *the environmental context*, including environmental prerequisites and the effects on the environment from the current and new technologies;
- *the cultural and socio-economic context*, including norms and values, as well as needs and priorities in the community, impact from and on the gender structure in and around the community, social and community organization, and the financial situation.

My aim has been to address the future-oriented design of new technological systems. I am attempting to “contribute to a functional version of the network” (Law, 2000: p. 7). The suggestions for future technologies should be seen as my own examples to build on and try out, rather than accomplished decisions, identified and approved by community members and other actors in the different contexts.

## METHODS

The study is qualitative, and is largely based on interviews and RRA (Rapid Rural Appraisal) exercises with individuals and households.<sup>5</sup> In a few cases, small groups of neighbours were gathered. Key-informants such as community leaders were interviewed at several occasions. Participant observation was done, insofar as I stayed with a family in the community, and shared their daily schedule, and as I experienced the health consequences of (unintentional) consumption of unpurified river water. Second-

---

<sup>5</sup> See e.g., Chambers, 1997 for information on RRA. I made use of its visual techniques, in order to organize and make collective knowledge visible to the participants. For example, one couple listed women’s and men’s household work, and a group of women and men drew ‘the house of their dreams’. Three neighbours identified and compared advantages of different toilet types.

### 3. Feminist Sanitary Engineering in Vioosdrif

dary material and information from NGOs working in the area have provided additional understanding.

In addition to my own stay in Vioolsdrif in 1997, Mariana Beukes assisted me by doing fieldwork in the same community in October 1999. Mariana Beukes lives in Namaqualand, and is an experienced development worker in her own home village and on the district level.

In total, I conducted 28 interviews and exercises with persons from 35 different households (out of the total 89 houses in the main community). M Beukes did 17 household interviews, and met with the youth group and the community leaders. At my first interviews, my host acted as the interpreter – translating between Afrikaans and English. Some interviews were conducted with another community leader as interpreter, and as I became more comfortable with my self-taught Afrikaans, the village and the interview situation, I did a number of interviews and exercises alone.

Interviews were carried out with women and men (individually, in couples and groups of neighbours) who were found at home during the days. A few farm workers were also interviewed in the evenings when they arrived home from work. Households included in the interviews were chosen to cover the spatial spread of the community. As the community was mixed concerning age groups, employment conditions, economic status, migration patterns, and family size, the spatial spread of the interviews covered these differences.

## WATER SUPPLY

### *Present solutions*

#### *The engineering Context*

Vioolsdrif is located within walking distance from the Orange River. In 1934, a canal was constructed along the river to provide a more convenient access to the river water for irrigation and domestic use. In 1995, the DC contracted engineers to improve the water supply to Vioolsdrif temporarily by placing two 5,500-liter tanks in the village. They were filled daily (Monday to Friday) by a tank truck with water from the canal, and the water usually lasted until Saturday (interviews and observations, 1997). Later, in 1999, additional taps were installed, and a solar pump pumped water from the canal to the tanks. The solar pump has the advantage of producing electricity at no running cost, and the sun shines most of the time. The pipes between pump, tanks and taps are laid above ground, as it is regarded as a temporary solution and the ground is hard to dig.

The present water supply is rather fragile and unstable, with frequent pump failures, pipe leakages and no improvement of the water quality. No engineers or technically trained persons are present to identify and repair breaks. Several persons expressed their frustration over this, like a middle-aged man who said, “*Die krane is so goed soos ornamente*” (“The taps are as good as ornaments”, interview, 1999). While the canal is stable and reliable, the solar panel does not work well and the community people are forced to collect water from the canal directly.

### *The user context*

For the individual user, the present water system is definitely problematic. For old and disabled people, or for those who work long days outside the village, the supply of water is a difficult task. Some old people claimed they occasionally had to pay others to collect water for them. The women, who do most of the water-consuming household work, have to minimize water use or do their laundry by the canal. The water consumption in the households varies between 10–40 liters per person per day (interviews 1997).<sup>6</sup>

The tanks have provided some improvement, and have marked the change to a democratic government, but have not caused any notable changes in the lives of the villagers. It seems that the tanks are only marginally better than collecting water of the same quality from the canal as earlier, and hence, there is little incentive to care for and assume control over the present system to make it run properly.

Knowledge of water-borne diseases is limited in the community. Some people complained about the water being muddy, especially after rains, and would leave it to settle in bottles before use (from interviews 1997). Stomach problems occur with frequent intervals among the inhabitants, but this is not explicitly understood as being connected to the water quality. A middle-aged woman commented, “*Ons is so gewoond aan die water dat ons nie ‘n gedagte het dat die water die tipe van [maagkrampe] probleem kan veroorsaak nie*” (“We are so used to the water that we have not thought the water can cause this kind of [stomach] problems”, interview, 1999). As people know that the water at the commercial farms owned by South Africans of Dutch origin and the police station is purified and chlorinated, people have a desire for purified water (interviews 1997 and 1999).

### *The environmental context*

The environment obviously sets limits, but must also be seen as providing possibilities. The river is near and perennial, and is possibly the main prerequisite for the community to be situated where it is in the first place. The warm and dry climate increases the need for water for drinking and washing, but also provides solar energy for water purification and pumping. The rocky ground has made it difficult to lay pipes. This is one of the reasons for the delay in improved water supply.

### *The cultural and socio-economic context*

The water supply is part of the identity in Vioolsdrif. As a sign of the new democratic era, the DC provided two water tanks in 1995, as described above. However, the temporary character of the present supply reminds everybody of her or his continued lack of material and legal status. Many people are familiar with the water supply systems at the white farms, and expect the DC to provide the similar standard of water supply. Although water is presently free of charge, and the inhabitants in Vioolsdrif have a very low and variable income, they are prepared to pay for water if it is delivered at an acceptable standard. The District Council requires payment for the present supply before they improve it, while the people in Vioolsdrif refuse to pay until the supply is

---

<sup>6</sup> The national aim is a minimum of 25 litres per person per day within 200 meters by the year for at least 51 weeks per year (White Paper, 1994).



### 3. Feminist Sanitary Engineering in Vioosdrif

reliable and safe: “*Die dag as ek moet water betaal, moet ek gereeld water kry.*” (“The day I have to pay for water, the water supply must be reliable”, a middle-aged man, 1999).

#### ***Future technologies***

##### *The engineering context*

There is obviously a need for engineers who design and construct an appropriate system, and this is no technologically problematic issue. NGOs like SPP that work in the area have contacts and experience, as has the DC. The nationwide NGO Mvula Trust (<http://www.mvula.co.za>) provides professional support in water supply and sanitation projects, covering the different contexts discussed here. There are also consultants that are well acquainted with the situation in rural Namaqualand. An appropriate technical system should include a pump and pipes to bring the water from the canal to the village, electricity to the pump, some kind of purification system (filter/chemicals/solar radiation) and a person who can maintain the system when it is in use. The pump and purification ought to be reliable and simple to maintain, and a few persons in Vioolsdrif need to learn how to operate the system.

While a more permanent system will take time to get in place, there are small-scale technologies for water purification that could be applied on a household basis in the meantime. In the sun-air method, for example, parasites are killed off to a high degree if a transparent water bottle is shaken (to add oxygen) and left in the sun for a day (Reed, 1997; Wegelin and Sommer, 1998). This technology is a cheap and simple way to reduce water-borne diseases. It could also be a low-cost alternative that is applicable on community scale at a later stage.

##### *The user context*

A new supply must meet expectations other than mere quantity and timing. Proper water supply is defined as a democratic right, both officially (White Paper, 1994) and among the inhabitants in Vioolsdrif. The inhabitants in Vioolsdrif with whom I discussed about future water supply said they wanted a yard tap. People also would prefer payment by volume, so that they know they get what they pay for. With a metered payment, “*Dan gebruik jou minder*” (“Then you will use less”, middle-aged man at the upper ledge, 1997). Several people claimed that they would not increase their consumption if they got a tap closer to their home.

There is a need for a commitment to take care of the system and pay for the water, and an income large enough to make it possible. There is already some knowledge of the high standards that the white farmers have, and hence a desire for improvement. The commitment will depend on knowledge about bacteria and hygiene, and ideas about how the new water supply may enable income-generating activities like tourism or horticulture.

##### *The environmental context*

The river will most likely remain a reliable water source for many decades, if other activities upstream do not change the flow. The stream could also provide energy for water pumping through a micro hydropower plant. The sun can be an important actor, providing electricity to the pump as is presently the case, and it can be used for water

purification in the sun-air method. The warm and dry climate obviously increases the dependence on river water, as the rainfall is minimal and the heat increases the need for water among humans, animals and plants. As has been mentioned, the rocky ground makes it difficult to bury pipes as it is expensive to excavate.

If not handled properly, chemicals for purification may cause pollution in the water or the soil locally. The wastewater is not a big problem, but with increased quantities, it will need to be taken care of. Washing detergents and chlorine are commonly used in the households, and the effluent water must be discharged in a way that does not contaminate the river further, or create stagnant water where insects can breed. If only harmless household chemicals were used, the wastewater would be suitable for watering plants. Some people have gardens with non-edible plants and flowers, and the use of wastewater in such gardens could increase the possibility for gardening.

#### *The cultural and socio-economic context*

The water supply is an important part of the democratization process. As mentioned above, a temporary improvement came in 1995, but the expectations regarding further improvements are high, and a minor change might be seen as a delay in major changes. The DC, on the other hand, may be reluctant to initiate major projects when they cannot see a commitment to maintain smaller installations properly. The overcoming of this mutual distrust will be crucial for the development process, and is likely to take place gradually.

The technical installation will probably be left in the hands of hired male engineers, but the women in the community give their input on design and installation choices. This prevents their strategic gender interests from being neglected or counter-acted. The women's practical gender interests (like cleaning, dishwashing, laundry, etc.) would be met to a higher degree if water was easier to access close to the houses. With a permanent water supply within a few hundred meters, the women would not need to plan their water use to the same degree, carry water or depend on somebody else to collect water in time. Purified water would also reduce the occurrence of diseases and the need for women to boil water for sick children.

Income-generation projects within the community will be a strong driving force for a piped water supply, and will in turn also contribute to the financing of the water. Here, NGOs like SPP will be important actors.

The land rights may be the most central prerequisite for any engagement, and housing has a high priority. A more permanent water supply will only come into question when the land rights issue is solved. The DC and the LDF will also need to work out a financial plan for the construction in order to receive a subsidy.

## **SANITATION**

### ***Present solutions***

#### *The engineering context*

During my stay in Vioolsdrif in 1997, I located 19 toilets among the 92 houses. Of these, only a few were used by more than one household. The other people went off

### 3. Feminist Sanitary Engineering in Vioosdrif

to the field. Half of the toilets were bucket latrines, which were emptied by the owner. The other half were shallow, unimproved pit latrines, which were covered and moved when full. The pits were said to last at least two years. They had been built on the initiative of the individual households, and there was no collective plan for sanitation. Both these types count as “inadequate sanitation facilities” according to the South African *White Paper on Water Supply and Sanitation Policy* (1994) and the *National Sanitation Policy* (1996).

#### *The user context*

Most people interviewed said that they wanted to have a toilet. They found it inconvenient to go to the open field, but gave no specific explanation as to why they did not build a toilet. Lack of material resources and the insecurity about land-ownership have probably contributed to the low willingness to take the initiative. However, some households did have a toilet, and women often said: “*Ek het self besluit om vir my toilet laat maak*” (“I have decided myself to have my toilet built”, interview with an old woman, 1997). In most of the cases, women had told their husbands or another man to build the toilet.

The cleaning of the toilet and emptying of buckets were arranged by each household. In some households, the woman was responsible, while in others the man did the work. A shared responsibility also occurred.

#### *The environmental context*

Defecation in the open is a health risk, as faecal-borne diseases are exposed to insects and animals that may spread the disease. The same is valid for the disposal of night-soil from the bucket latrines. The dry and hot climate reduces this risk, as the faeces dries quickly, and as the number of animals and insects is low. The fact that there is little rain and the groundwater table is deep prevents contamination of and spread through the groundwater.

The toilet users reported that they use strong chemicals to reduce the smell in the toilet, if they can afford it. Although it is in small amounts, this creates a local problem with risk of pollution, and lower quality of the nightsoil (if it is to be used as a fertilizer). Antiseptic chemicals also disturb the microbiological degradation of the faeces.

#### *The cultural and socio-economic context*

Although the people interviewed said they wanted privacy, it was apparently not a strong enough incentive for most households to build their own toilet. The toilet solution was not seen as a collective concern, but a responsibility for each household to handle. Regulations and plans may, however, be made for a community or for larger areas.

In many ways, the socio-economic situation is the same for water and sanitation, although the water supply is more clearly necessary to handle on the community level. To arrange for building materials for toilets may be beyond the capacity of some, and the lack of land rights may discourage many from temporary installations, but it was also argued by those who did have a toilet that there is no excuse for not building one (group discussion, 1997).

### *Future technologies*

The national aim is that every South African should have access to a VIP (ventilated improved pit latrine) as a minimum standard (White Paper, 1994). The government offers a subsidy of R600 for toilets (1997), which is supposed to cover the costs of a VIP latrine.

#### *The engineering context*

There are different alternative toilet designs to consider. Water flush toilets can be built in the house, while the smell from dry systems may require that the toilet is placed outdoors. Dry system toilets are easier to design with local material, and will be considerably cheaper and easier to adjust according to personal preferences. Similarly, the dry toilet is less vulnerable to breakage, as it contains few moving parts and requires no external input.

Technically, the installation of water toilets in Vioolsdrif would be possible, although the treatment of effluent sewage would demand some kind of installations for dewatering and compost or anaerobic digestion tanks to hygienize it, and/or root zone infiltration to catch nutrients in the fluids. Underground installations are, as mentioned above, difficult in the rocky terrain. A water-borne sanitation system on household or community level would thus need serious consideration and planning to work properly and safely both for the users and the environment.

The commitment of engineers who work in NGOs like SPP and Mvula Trust is to provide affordable, socially acceptable and technically suitable water supply and sanitation systems in accordance to, and together with, the communities' needs and local resources. These engineers and NGO staff are very important in the negotiations.

#### *The user context*

For the individual user, a water flush toilet is more convenient, provided it works properly. As soon as the water supply fails, it becomes useless. Without directly piped water to the toilet, the users must collect the flush water in buckets every time. This is a major inconvenience. In the final choice, the status of the toilet may in practice be more important than the convenience.

The fact that both women and men handle toilet waste and take part in decision-making about these issues suggests that a new toilet system will be the most desired by all household members. It also makes it possible that all kinds of different aspects, including maintenance, children's use, safety at night, and emptying of full tanks, will be taken into account. The degree of trust between the users and the engineers and consulting NGO staff who work with the community will determine the success of negotiations and acceptance of the final decisions that are made for the household and the community as a whole.

#### *The environmental context*

The choice of new toilet can have a major impact on the environment. The river water is close enough for water flush toilets to be an alternative. However, the soil conditions will make it difficult to install the necessary septic tanks or other local wastewater treatment. The capacity for infiltration is limited, given the thin or non-

### 3. Feminist Sanitary Engineering in Vioosdrif

existing soil layer. Excavation to bury pipes and tanks will be heavy and need machinery, which means costs and a necessary cooperation to have several toilets done at the same time. The outlet of sewage may not be a problem in the short run, as the groundwater flow is deep below the surface, and the population is small and spread out.

The VIP latrine may in principle have the same pollution risk, as the liquid is supposed to infiltrate while the solids will be composted in the pit. The difference is the water added in the flush toilet, which will of course increase the infiltration and transport of nutrients in the ground.

#### *The cultural and socio-economic context*

The cultural and socio-economic context will probably be the primary location for decisions on sanitation. The sanitation system in many ways depends on the same actors as the water supply, although it is more up to each individual household to decide and act. Therefore, a crucial point of passage is the decisions made by each household to build a toilet. This decision will in turn depend on the knowledge about different alternatives.

NGOs that are active in this field offer a demo VIP latrine, which can be installed at the school or another official site in the village. This has still not been done in Vioolsdrif (1999). The LDF has undertaken study visits to places where different models are in use, in order to identify the one they find most suitable for the households in Vioolsdrif (interview 1997).

The water toilet clearly has a higher status. Some people argue that since the river is within walking distance, and as the white farmers have water flush toilets, there is no reason *not* to install water toilets (interviews 1997 and 1999). Others claimed that any kind of toilet would be good enough. The reuse of human excreta as fertilizer is not unthinkable, although it is not practised as few people grow any plants.

Few households are willing to spend much effort on a toilet before they have a more permanent house. A common vision is to have a water flush toilet in the house, and some villagers are “sick and tired of these primitive dry toilets” (group discussion 1997). One solution that was tried, for example, in Nourivier in Namaqualand was to install both a water toilet indoors, and a dry toilet in the yard, and use either depending on the time of the day and the access to water (personal communication, Beukes, 1999). The government subsidy for toilets, R600, is just enough for a VIP latrine and any excess costs will have to be covered by the owner. This may hinder many Vioolsdrif families from installing any water toilet.

### CONCLUDING REMARKS

I have tried to consider promises and constraints regarding existing and future water and sanitation technologies in the different contexts. My analysis is of course marked by the fact that I am foreign to the location, I am a white, Swedish, environmentalist, feminist woman, and I am an engineer. I have my priorities, and with the given situation as I identify it, I draw my conclusions about suitable solutions for Vioolsdrif. My discussion of water versus dry toilets for example is an attempt to negotiate between

my own preference for dry systems and my experience of the priorities for flush toilets made by community members.

The training of engineers to design the Sustainable Future, and the training of Swedish pupils to “pity the poor”, makes it extremely complicated for me as a Swedish engineer to contribute constructively and in symmetry in a context like Vioolsdrif. I have been taught to be an expert, giving advice, rather than to listen and learn from the users of the technology.

Similarly, I think that feminists in my part of the world often expect to find certain oppressive gender structures in a location like Namaqualand, and that this influences me and colleagues to interpret gender structures according to the expected pattern of inequality. In Vioolsdrif, I noticed that women have the freedom to act as community members and household members, and that their constraints depend more on the status and power of the community as ethnically disadvantaged, rural, and poor in relation to the surrounding area, than on their gender. The employment conditions were similar for women and men, the household work was less gender stratified as compared to reports from other studies conducted at other locations – even those close by. Strategic interests like the right to own land, vote, have bank accounts and take part in community boards were legally the same as for men and in practice more and more common in Namaqualand. In 1999, the chairperson of the LDF in Vioolsdrif was a woman with a large social network in the community. In the particular case of Vioolsdrif, “No. Men are not the enemy. The enemy is the total societal structure,” as Ogun-dipe-Leslie (1994, p. 82) has expressed in her version of African feminism. It is my interpretation that the gender relations in Vioolsdrif make it possible to take women’s practical and strategic gender interests into account when water supply and sanitation technologies are developed. As women and men both experience the workload connected to water supply and toilet cleansing, there need not necessarily evolve a gendered conflict over priorities and investments.

It is important to note that my interest in the community has been as an engineer. I have, therefore, spent time primarily to discuss technologies, rather than relations and power structure in the community. A sociological study would provide a more in-depth map of the societal structure and relations.

What I have tried to incorporate in this article is that in order to introduce feminism in the engineering practice, it is necessary to assess the technology *in its design and development phase* in the engineering, user, environment, cultural and socio-economic contexts. These contexts all embrace actors with their own imperatives to participate in the negotiations over the technology. As an engineer, I do not have the best arguments or the final say. This is extra important when I travel so far between my home and the location of interest.

With this feminist understanding of the technology development process, I think that the only possible way to negotiate successfully over future water supply and sanitation technologies is to involve engineers whose experiences lie closer to those of the Vioolsdrif inhabitants than mine do. South African research institutes and NGOs like SPP have made a serious commitment to establish continuous relations with communities in Namaqualand, including Vioolsdrif. Their capacity to combine situated knowledges of natural resources, social contexts, economic limitations and technological alternatives, and communication with community members and groups will be a necessary part of the forthcoming technology development process.

## REFERENCES

- Archer, Fiona and Meer, Shamim** (1997) "Women, tenure and land reform: the case of Namaqualand's Reserves", in Meer, Shamim (ed.) *Women, Land and Authority. Perspectives from South Africa*. Braamfontein: National Land Committee, pp. 84-94.
- Bush, Corlann Gee** (1983) "Women and the assessment of technology: to think, to be; to unthink, to free", in Rothschild, Joan (ed.) *Machina ex Dea: Feminist Perspectives on Technology*. New York: Pergamon, pp. 151-170.
- Chambers, Robert** (1997) *Whose Reality Counts? Putting the First Last*. London: IT Publications.
- Constitution of the Republic of South Africa** (Act 106 of 1996), see <http://www.gov.za/constitution/index.html>
- Deshingkar, Priya and Cinderby, Steve** (1998) *Renewable Natural Resource Use in Post-apartheid South Africa*. Stockholm: Stockholm Environment Institute.
- Haraway, Donna** (1997) *Modest\_Witness@Second\_Millennium.FemaleMan©\_Meets\_OncoMouse™*. New York: Routledge.
- Law, John** (1987) "Technology and heterogeneous engineering: the case of Portuguese expansion", in Bijker, Wiebe, Hughes, Thomas and Pinch, Trevor (eds) *The Social Construction of Technical Systems: New Directions in the Sociology and History of Technology*. Cambridge, Mass: MIT Press, pp. 111-134.
- Law, John** (2000) *Networks, Relations, Cyborgs: On the Social Study of Technology* (draft; Lancaster University, Centre for Science Studies and the Department of Sociology). <http://www.comp.lancaster.ac.uk/sociology/soc042jl.html>
- Molyneux, Maxine** (1985) "Mobilisation without emancipation? Women's interests, the state, and revolution in Nicaragua", *Feminist Studies* Vol. 11, No. 2, pp. 227-254.
- Morgall, Janine Marie** (1991) *Developing Technology Assessment. A Critical Feminist Approach*. Lund: University of Lund Dissertation.
- National Sanitation Policy** (1996) Republic of South Africa National Sanitation Task Team.
- Ogundipe-Leslie, Molaria** (1994) *Recreating Ourselves: African Women & Critical Transformations*. New Jersey: African World Press, Inc.
- Pietersen, Kevin, Titus, Rian, Adams, Shafick, Buis, Ronelle and Williams, Milicent** (1996) *Groundwater Assessment and Strategy for Western Karoo, Namaqualand and Bushmanland Inception report*. Cape Town: CSIR and UWC, unpublished.
- Reconstruction and Development Programme** (1994) Johannesburg: ANC.
- Reed, Rob** (1997) "Sunshine and fresh air: A practical approach to combating water-borne disease", *Waterlines* Vol. 15, No. 4, pp. 27-29.
- Rydhagen, Birgitta** (1999) *Feminist Sanitary Engineering in Rural South Africa. A Theoretical Framework*. Luleå: Luleå University of Technology Licentiate thesis 1999:69.
- SIDA** (1994) *Gender and Water Resources Management*. Stockholm: SIDA. Report from a workshop held in Stockholm 1-3 December, 1993.
- Vioosdrift Opname, Mei 1996**. Vioosdrift Aksieraad and Surplus People Project, Vioosdrif, unpublished.

**Wegelin, Martin and Sommer, Bernhard** (1998) “Solar water disinfection (SODIS) – destined for worldwide use?” *Waterlines* Vol. 16, No. 3, pp. 30-32.

***White Paper for National Water Supply and Sanitation Policy*** (1994) Cape Town: Department of Water Affairs and Forestry.







## **TOWARDS HETEROGENEOUS SANITARY ENGINEERING**

This paper will be found in *The Journal for Transdisciplinary Environmental Studies* Vol. 1,  
No. 2, <http://www.journal-tes.dk/> available from mid December 2002.







# **PARTICIPATORY PRACTICES IN SOUTH AFRICA AND SWEDEN<sup>1</sup>**

## **INTRODUCTION**

Participation has become one of the mandatory principles in “Third World development”. When mundane technological systems are developed, people are expected to participate with muscle power and (ideally) also with ideas, visions and decisions for their own local situation. It is expected that transferring the initiative, decisions and responsibility to the users themselves will ensure that the system is appropriately designed, used and cared for.

In our own part of the world, people who talk about similar technology development utilize an almost completely different set of concepts and ideas – at least in my own area of interest. In the development of infrastructure systems like water supply and sanitation, there is no expectation whatsoever of the users being interested in or taking part in design or of their taking responsibility for maintenance. Instead, specialists decide, design, install and maintain the systems. As a result of this approach, the technology is placed in black boxes (Callon and Latour, 1981, p. 285) out of the users’ reach, creating distance between specialists and lay people, between practices and consequences of the practice, and between nutrient production and reproduction.

In this paper, I discuss what these differences mean to the different users, specialists and to the development of technological practices in the different societies. Do we expect more of a user in an African village than in our own society, when it comes to interest and competence? Or do we imagine our own systems to be much more complex and hence impossible to leave in the hands of “common people”? What promises and limitations do the different approaches have, environmentally and socially? Are translations between the approaches possible?

I will first comment on user participation in the development discourse, and in a case study I was involved in in South Africa. Then I will present a case of Swedish technology development and the non-presence of user participation in that case. Finally, I will discuss the differences between the cases, and my own expectations and thoughts about participation after the comparison.

## **PARTICIPATION IN DEVELOPMENT**

Participation has become an important part of development rhetoric and practice. Numerous examples of participatory development projects in different parts of Asia and

---

<sup>1</sup> The research in South Africa was financed by Sida/SAREC (the Swedish International Development Cooperation Agency/Department for Research Cooperation) and a travel grant from Nordiska Afrikainstitutet (Nordic Africa Institute). The research in Sweden was financed by FORMAS (the Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning) and VA-FORSK (the Swedish Water & Wastewater Association Research Department).

Africa are discussed in academic literature. The overarching idea is that the beneficiaries (most often rural communities) are supposed to own the development project and participate in all parts of the process, from planning to evaluation (IDS, 1996). Ideally, the initiative is supposed to come from the community, and a project, it is argued, is likely to be successful and sustainable only if the beneficiaries participate actively in planning as well as realization. The community members are supposed to think and act collectively through workshops, discussions and different activities led by a facilitator.

My first contact with participatory approaches has been PRA – Participatory Rural Appraisal<sup>2</sup>. According to Chambers, the focus of PRA is “trying to do better by action more than thinking about theory” (1997, p. 196f). However, this does not imply a lack of theoretical discussions. With its understanding of knowledge as partial and perceptions as selective, PRA is related to postmodern theory (Chambers, 1997).

Chambers (1997) emphasizes the approach (handing over the initiative to the beneficiaries, respecting their knowledge and experiences, etc.), as opposed to the tools, as the most important element, but within PRA, many tools for activities are also developed. These tools include a variety of visual exercises like collective map construction, preparation of calendars, and ranking of alternatives, in combination with better known qualitative methods such as interviews, observation and second data review (see e.g. Chambers, 1997, pp. 116–119 and Narayan, 1996, pp. 82–95). The tools are designed to resolve specific problems and should be adjusted to suit the particular situation.

Being action-oriented, PRA has developed around the principle of consensus. However, over the years it has come to be recognized, especially among gender researchers, that an assumed consensus might very well hide persons or groups without the power to contribute to the discussion. For example, in some circumstances, women are not allowed to speak in public and are thus prohibited from contributing their views and preferences (Guijt and Kaul Shah, 1998).

According to Dreyer (2000), the literature and research about participatory development are keen to point to success stories, while failures in participatory projects are blamed on poor facilitation rather than on wrong approach. Dreyer questions the optimistic view of participation and lists a number of unreliable assumptions made in the field of participation. For example, the assumption that the community is a single entity with common needs is often ill founded. As Dreyer points out, a community does not necessarily abide by consensus decisions or by decisions made in the past. In addition, the people who participate in the planning activities may not represent the whole community, and everybody might not be interested in supporting the process.

In the anthology *The Myth of Community* (edited by Guijt and Kaul Shah, 1998), several authors discuss the complexity of the concept of community, and especially from a gender perspective. According to these authors, many participatory activities have failed due to gender blindness. In many locations, women are unable to attend public meetings or to speak in such meetings. In cases of agricultural projects, they may

---

<sup>2</sup> Participation comes in many varieties. This discussion derives from PRA (participatory rural appraisal) or the subsequent PLA (participatory learning and action) as it is presented by for example IDS, 1996, Chambers, 1997, Guijt and Kaul Shah, 1998 and Narayan, 1996. A more thorough discussion of PRA and feminist research can be found in Rydhagen, 1999.



not possess the land necessary for the activities although they would like to participate. Women as a group or as individuals may also have different priorities to men, given that their responsibilities are different, and this is not always recognized. These gender issues throw light on the problem of social structures within communities that necessitates problematization of the vision of consensus (Crawley, 1998, p. 29).

In addition to the differences within a community, Michener (1998) has shown how different actors interpret the situation differently. In her example, the ideas of participation differed between the NGO (non-governmental organization) at a central level, the local NGO workers and people in the participating communities. At the central NGO level, Michener's analysis is that "participation, however, still seems to refer to the responsibilities of communities in making the project successful". In this particular case, the beneficiaries were, rather cynically, expected to participate "in all stages of the project cycle in the form of local resource contributions. The intended result is to render projects efficient by securing beneficiary commitment" (Michener, 1998, p. 2110).

The field staff in the same NGO did not believe that the local communities were capable of playing a major role, and the decision-making that was shared concerned administrative issues rather than planning of the project. A dilemma for the local NGO was the risk of training local communities to care for themselves, which would lead to the NGO staff losing jobs, control over resources they were responsible for, etc. They thus tended to keep control of the projects they were running.

The community members saw their own contribution in broader terms than the NGO staff and felt that their responsibilities and contributions were quite substantial. However, they did not feel like participants in the decision-making, nor did they have a sense of responsibility for the project as a whole. Individuals participated in order to try to get a better position, a job at the NGO or access to training and a "ticket" to the city. Michener suggests that the community had become used to depending on outside support and had learnt to make use of it to their own benefit. They may therefore not be willing to spend extra time on participatory exercises, if they can get "cheaper" projects from other organizations.

The different interpretations of participation will of course have consequences for the success (and the interpretation of success or failure) of a participatory activity. Michener's conclusion is that none of the actors is "fully engaged in genuine transformative participation" (1998, p. 2115), and that they have different interpretations of what participation actually means. She recommends development planners to "adjust participatory frameworks to be more responsive to field-level realities" (1998, p. 2116).

With reference to Michener, Dreyer (2000) suggests that participatory activities are not always necessary or contribute to a positive outcome. In many cases, it is better if the specialists focus on the beneficiaries while continuing to be responsible for the planning.

## **PARTICIPATION IN THE CONTEXT OF RURAL SOUTH AFRICA**

Rural citizens, almost all over the world are obliged to take more responsibility for their local technological systems like sanitation. In South Africa, the Government has established national minimum standards for water supply and sanitation. To increase

the possibility for the rural poor to install proper latrines, the Government offers a subsidy to cover most of the costs, and advisors at the district and municipal offices visit rural communities as consultants. In addition, NGOs give advice and assist with formalities when needed.

I was involved in a study of rural water supply and sanitation in South Africa in 1997, and although participation was not rhetorically emphasized, it was obvious that officials and NGO representatives expected initiatives from the local community. In the mid-1990s, the District Council (DC) responsible for the district of Namaqualand in north-western South Africa had introduced and initiated Local Development Forums (LDF) in the rural communities. The LDFs communicated with the DC through counsellors representing a group of neighbouring villages or a larger community. In each community, the LDF was formed by representatives from local organizations like women's groups, church groups, schools and political parties, and interested individuals had a great possibility to get involved. The LDFs were engaged in activities like water supply schemes, income generation projects and land rights issues, and NGOs were established in the district to support and advise the LDFs in their efforts.

In the participation rhetoric, there are supposed to be different levels of participation, ranging from "community initiating action" to "mere information sharing"; however, when I try to identify who actually took initiatives in the communities in Namaqualand, this distinction becomes blurred. The Government has identified minimum standards for domestic water supply and sanitation facilities (25 litres per person per day within 200 metres, and a VIP – ventilated improved pit latrine; *White Paper*, 1994). These standards are spread by word from Cape Town to district capitals to community members through NGOs and local politicians. Hence, an "acceptable level of desire" is already planted in the community, who may then approach the same politicians and NGOs for support to realize the standard levels. The NGOs, the District Council and the Local Development Forums have continuous contact. Obviously, they discuss and exchange information about what needs priority, what is feasible from an economic point of view, who is able to provide practical assistance and how the contacts between the community and the other actors should proceed.

The DC is thus a communication partner, but it does not push development projects on the communities. The outcome is that communities with active and competent leaders are running several community development projects, while in communities where leaders are passive, not trusted or weak, there are no efforts from outsider actors.

In the community where I stayed, the leaders were not trusted by all community members. The leaders, in turn, complained about passive community members and claimed they could not do anything without initiatives from the community members. The result has been a very slow development process; for example, no toilet projects had been initiated by any of the actors. When I asked the community members, some claimed they wanted to have water flush toilets, as the nearby farmers had (from interviews 1997). Pit latrines, as suggested by the Government, were regarded as a negligible improvement on the present condition where they do not have any toilets.

## PARTICIPATION IN THE CONTEXT OF URBAN SWEDEN

An urban citizen in Sweden does not expect to spend any time or effort on sanitation. The waterborne sewage system is very convenient for the user and leaves all the trouble to the engineers at the other end of the pipe. The urban citizen also does not know anything or does not consider her/himself to know enough about the sewage system to motivate his/her increased involvement. We tend to trust the specialists, and as Hallström (2001) states, the technical urban infrastructure was for a long time considered non-political and was left entirely to technical specialists.

Recently, the water and sanitation system has been reintroduced into politics and is under negotiation, as the present system needs to be adjusted to meet raised environmental requirements. Nitrogen removal processes have been added to the existing wastewater treatment plants. In the public arena, the debate mainly revolves around the use of the residual sludge as fertilizer on agricultural land. In addition to refinement of existing systems, ecological alternatives to the traditional, waterborne single-fraction sewage system are being tested in a few different localities. In the 1980s, so-called eco-villages were built with urine diversion and local faeces composts for use on local gardens and fields. Later, urine diversion toilets were installed in a number of urban homes, both individual houses and multi-storey apartment blocks (see e.g. Widahl et al., 1999). Now we are also seeing a few other alternatives, like vacuum systems or black-water systems (where the toilet sewer is source separated from other wastewater), but the expansion of alternative sewage systems is very limited.

The interesting question from my perspective is who participates in this process. In the eco-villages, the local inhabitants took the initiative and decided what they wanted, just as they are expected to do in rural South Africa, and in some cases, they also arranged the practical work with their own technical skills. In the urban homes, the situation is quite different. In most cases, the municipality or the property owner has decided to try out a new sewage system, in new homes or in renovated properties. The residents have not had a chance to choose what they want. Their only choice is to move in or move out.

On two different occasions, I have listened to groups of sanitation specialists discussing the role of users in the conversion of sewage systems towards more environmentally friendly systems. On one occasion, the group was asked to discuss their perceptions of the users of the sanitation system rather broadly. It was my perception that the dominant view was to regard the user as a stressed and disinterested person, who must be informed in different ways in order to use the system correctly.

On the other occasion, the group did a multiple-choice comparison between two prototype sanitation systems. One alternative was based on source separation of urine, faeces, greywater (wastewater from other household activities) and organic solid waste, and the other alternative was single-fraction collection and advanced treatment with nutrient extraction from the sludge. One of the categories that they were evaluating was socio-cultural aspects of the two different systems<sup>3</sup>. The group had received background material on all the categories, but based much of their evaluations on their own previous knowledge and on the discussion in the group. When it came to socio-

---

<sup>3</sup> The other categories in the multiple-choice comparison were hygiene, environment, economy and technological robustness.

cultural aspects, the group members were very dissatisfied with the background material, which was qualitative and reasoning, instead of presenting statistics or tables. Some of the group members denied that their own training and acquaintance with technical and biological matters was the major obstacle to making evaluations on these aspects. Their conclusion was nevertheless that the combined system would be easier to introduce to the users.

I have also undertaken interviews with residents in an area of new-built private houses in an urban area close to Stockholm where the municipality had required the constructors to install a local waste water system. The home owners participated in the construction in order to reduce the costs, and the result was that they were very aware of many aspects of the whole situation such as wastewater treatment, contact with the municipality and possibilities to complain and take action. One of their stories was how during the construction process they realized that the construction company had decided to install urine-diverting toilets, but with only one combined pipeline for the two fractions in the street. After some debate and controversy with the company, they succeeded in changing the toilets to ordinary (low-flush) toilets.

My overall impression is that the specialists did not expect the residents or users in urban Sweden to be interested, knowledgeable or to have time to spend and that the most we can expect is that they hopefully will not flush harmful chemicals down into the sewer. The non-existence of a large people's movement for alternative sanitation might be a proof that this is a correct analysis of the situation.

### **SOUTH AFRICA VS. SWEDEN OR URBAN VS. RURAL?**

It should be noted that differences exist between the rural and the urban areas in each country and that there are some similarities between the urban areas in the two countries and the rural areas in the two countries. In South Africa, there are affluent urban areas where the sanitation systems are very similar to the Swedish system, with flush toilets and municipal wastewater plants. There are also so-called peri-urban areas, which are densely populated but with inadequate infrastructure. These are often inhabited by poorer people. Some of these people have recently arrived in the city from rural areas or from abroad and have come in search of work. Others have lived in their houses for a long time without proper water supply or sanitation. In some of these peri-urban areas, waterborne sanitation is installed by the municipality, while in others, pit latrines are constructed through local self-help projects.

In rural Sweden, like in South Africa, individual households (e.g. farms) are responsible for the practical arrangements and the management of their sanitation system. Consultants usually both supply the products and perform the installation work, if the house owner cannot do it him/herself. In Sweden, there are environmental regulations for the sanitation system, and the rural household must apply to the municipality for approval before installing a sanitation system.

However, while rural communities of a few hundred inhabitants in Sweden would be provided with municipal services, in South Africa, they need to act as a community to arrange their services. Thus, one difference between the two countries is that community participation as a concept does not exist in the Swedish case. Rarely is a community obliged to act as a collective. There are exceptions to this, such as on the

island on the west coast of Sweden where a village was forced to rearrange their sewage system and decided to install a small-scale treatment plant for the whole village. One of the community members runs the plant for the community (Widahl et al., 1999). However, the norm is that the municipality *or* the individual household arranges the sewage.

### HOW MUCH PARTICIPATION CAN WE TAKE?

It is my experience, that in development projects in places like Namaqualand in South Africa, user participation is expected to be part of the whole process, while in Sweden, the residential aspects are treated as separate from the pipes and toilets and disposal of human excreta after treatment. The residents are simultaneously regarded as the pre-condition for possible solutions and “the error”, but they are not regarded as a partner in negotiations.

For a long time, I have been convinced that participation is a way to increase democracy and thus a goal in itself, and that it is a positive ingredient in technology development. The criticism in *The Myth of Community* (Guijt and Kaul Shah, 1998) has a spirit of correction rather than rejection. Most of the literature on participation I have come across concerns small non-bureaucratic projects in rural Africa and Asia, and my idea is shaped by this mental picture. When I turned my attention to urban Sweden, the scene appeared to be quite different. It was regarded as complicated to involve urban dwellers in a decision-making process framed by so many legal and administrative procedures. It seemed utopian to expect modern, stressed and double-working people to take part in time-consuming discussions about advanced technological systems.

These arguments gave me, in turn, a new perspective on the development context. Why do we expect the rural population in Africa to invest in a participatory process, while we do not expect the same from Swedes? Are poor, rural, illiterate, African farmers better equipped to spend a lot of time in technological discussions than literate urban residents in Sweden?

The confusion increases with the statement about the South African context by Dreyer (2000) that “we can safely scale down the role that participation is now fulfilling as long as we keep in mind that we are planning for people”. Dreyer argues that we expect too much from a too complex “community”, also in the case of rural Africa.

Is the solution to maintain the contemporary expert system, only adding some social competence to the training of engineers? Or should we demand also from busy urban Swedes that they spend Thursday evenings with their neighbours, discussing art installations, motor traffic in the area, local nutrient recycling, etc?

The answer is of course not a case of “either-or”. The challenge is instead to form ways to make participation meaningful and to define the degree to which somebody on the outside shall formulate the limits of the process, take the first initiative and produce some kind of background material.

In the workshop about multiple-choice methods for sanitation systems in Sweden mentioned earlier, it was obvious that the participants (who were all specialists in some aspect of sanitation and its consequences) were frustrated by the limitations they were confronted with. They had to choose between two predetermined systems that many

participants were sceptical about. They also had to make their evaluations based on background material that was incomplete and in itself a test of what kind of information is needed. The result of the insufficient background information was that the participants made many of their valuations based on their previous experiences. If people with less acquaintance in the area of sanitation are involved, background information material will be more crucial. But then again, who is to decide what kind of background information is needed for what kind of decision?

We are intertwined in complex networks of property owners, European and Swedish laws and regulations, municipal employees, the people who actually live in the houses, existing infrastructure, limited budgets and service fees. This makes it difficult for residents to initiate an activity of some format that will actually pass all necessary steps. You can initiate a compost project in your own house, but you cannot demand a local sanitation system in an apartment block. Nor can you (always) refuse if the owner decides to renovate the flat you rent.

But what about rural South Africans? Are their lives and societies not as complex?

### **WHAT IF THEY WANT THE WRONG SOLUTION?**

A reflection from my stay in Namaqualand in South Africa is that a community may be very clear about what they want, but outside actors like myself may find this desire completely inappropriate. In this desert-like place, where good-quality water is hardly found and all water is scarce, the people in the coloured community want water flush toilets. This does not come from pure imagination or ignorance, as the white farmers in the neighbourhood have their water flush systems and water their lawns and fields. How do you proceed in such a case?

The same could occur in urban Sweden. How would I react if a group of residents in urban Sweden, for example, decided to continue with water flush toilets rather than to try an alternative system? Or if they do not want to get involved at all? Or if they do not agree within the group? In my interviews with residents in Sweden, the persons who were interviewed were content with their living, despite some problems with the sewage system, and they tried to be responsible for the environmental consequences of their activities. However, they complained that not all of their neighbours were as serious in their commitment to the idea of environmental living. For example, a number of households did not compost their kitchen waste, as they were supposed to<sup>4</sup>.

These simple questions touch upon a critical aspect of participation: the fact that different people have different priorities, and that when we involve more people in the decision-making, we (as engineers or policy makers) risk losing control over the direction developments take. It might be that the “invisible” infrastructure built into walls and laid underground is an extreme in the participatory approach. So far, participatory approaches have focused on situations where the participants are familiar with the product or system that they are involved in developing. Farmers, for example, are in-

---

<sup>4</sup> In the waste collection tariff, home composting is a requirement for the lower tariff. The whole area has this tariff, and it was one of the preconditions when the land plots were sold to the individual house owners.

volved in the development of new seed varieties or irrigation technologies (Chambers, 1997 and Guijt and Kaul Shah, 1998), and computer users are involved in the design of new software (Tap, 2001). In the workshop mentioned above, all the participants worked with sanitation or related issues in some way. Residents in an urban setting have very little to do with sanitation systems. It might be necessary – if participation is a goal in itself – to start with more visible and close issues like the micro environment in the houses and in the gardens. Indeed, this is being done, especially in areas with old, run-down houses, high circulation of tenants, and widespread graffiti and damage.

### FINAL REFLECTIONS

It has been illuminating to study urban Swedish sanitation from the perspective of rural South Africa. The South African study made it possible for me to problematize the way specialist knowledge and lay knowledge are treated in Sweden and the non-existing dialogue between engineers and decision-makers on the one hand and the users of technologies on the other. With my positive ideas about user participation, I expected to contribute to the introduction of participatory practices in Swedish sanitation technology development.

At the moment I am extremely ambivalent on the question of participation, and the comparison between rural South Africa and urban Sweden has clarified my conflicting interests. In the rural South-African context, I was quite convinced that the users should be owners of and participants in their own technical infrastructure. This would make them less dependent on outsider specialists and on expensive contractors. It would also increase the sense of community, which could in turn lead to more and other projects that would generate income and employment or improved possibilities for children's activities etc.

In urban Sweden, I am more familiar with all the obstacles to a successful participatory process, including the risk of ending up with environmentally harmful choices. Most of the inhabitants in the community can afford to pay the rather modest water and sanitation bill, and most people happily pay their bill and leave the responsibility to care for the system to the municipal workers. In South Africa, the household economy will in many cases not allow for payment of externally maintained systems, thus creating a situation where local community involvement becomes a necessity rather than a virtue.

The question arises whether user participation is introduced to reduce costs and transfer responsibility or if it is recognized that involvement of the users and their knowledge, experiences and capacities will contribute to the quality of the technological system.

Despite my ambivalence, I am inclined to think that broad user participation in the development of technologies is positive. As I mentioned earlier, rural people, all over the world have a larger ownership of their practical arrangements. I personally think it would be good if urban dwellers too were more involved. I believe personal responsibility is a key to understanding the complexity and vulnerability of different systems, and that once you are involved, it is easier to take on more responsibility and to share it with others.

I do, however, wonder how people in general will become more involved without a plain top-down enforcement of these bottom-up principles. The sanitation system is in many ways an extreme case for participation in technology development. It touches upon very private issues, and few people experience the need for a change in the system.

This leads further to the question of participation in the development of environmental technologies like ecological sanitation, where the benefits of a change lie far away from the users/residents. How much environmental awareness can we expect from people?

A bottom-line starting point in order to try to involve users in the development of sanitation technologies would be that engineers begin working on their (our) own conceptions about the users. If we cannot (immediately) invite residents to join the planning processes, we can at least start to consider their competencies, needs and obstacles with respect and serious interest.

## REFERENCES

- Callon, Michael and Latour, Bruno** (1981) "Unscrewing the big Leviathan: how actors macro-structure reality and how sociologists help them to do so", in Knorr-Cetina, Karin and Cicourel, Aaron Victor (eds) *Advances in Social Theory and Methodology. Toward an Integration of Micro- and Macro-sociologies*. Boston, London and Henley: Routledge & Kegan Paul.
- Chambers, Robert** (1997) *Whose Reality Counts? Putting the First Last*. London: IT Publications.
- Crawley, Heaven** (1998) "Living up to the empowerment claim? The potential of PRA", in Guijt, Irene and Kaul Shah, Meera (eds) *The Myth of Community. Gender Issues in Participatory Development*. London: IT Publications, pp. 24-34.
- Dreyer, Lynette** (2000) *Disappointments of Participation: Finding the Correct Role for Community Participation*.  
<http://www.up.ac.za/academic/libarts/polsci/awiru/op15.html> (read 14/9/2001).
- Guijt, Irene and Kaul Shah, Meera** (1998) "Waking up to power, conflict and process", in Guijt, Irene and Kaul Shah, Meera (eds) *The Myth of Community. Gender Issues in Participatory Development*. London: IT Publications, pp. 1-23.
- Hallström, Jonas** (2001) *The Healthy City and Modernity: The Evolution of Water Supply and Sewerage in Norrköping and Linköping, Sweden, 1860-1920*. Linköping: Linköping University, manuscript.
- IDS** (1996) *Policy Briefing Issue 7: August 1996*. Brighton: Institute of Development Studies, University of Sussex.
- Michener, Victoria** (1998) "The participatory approach: Contradiction and co-option in Burkina Faso", *World Development* Vol. 26, No. 12, pp. 2105-2118.
- Narayan, Deepa** (1996) *Towards Participatory Research*. Washington DC: World Bank Technical Paper Number 37.
- Rydhagen, Birgitta** (1999) *Feminist Sanitary Engineering in Rural South Africa. A Theoretical Framework*. Luleå: Luleå University of Technology Licentiate thesis 1999:69.



- Tap, Hans** (2001) *Do You Mean Here? Points of Departure for Design*. Karlskrona: Blekinge Institute of Technology Licentiate Dissertation Series No 02/01.
- White Paper for National Water Supply and Sanitation Policy** (1994) Cape Town: Department of Water Affairs and Forestry.
- Widahl, Karin, Renström Johansson, Åsa, Berg, Per E O, Edén, Michael och Dahlman, Sven** (1999) *Avlopp för Kretslopp. Ett Beteende Perspektiv på Tillblivelse, Drift och Användning av Urinseparerande System* [Sewage for Recycling. A Behavioural Perspective on Inception, Maintenance and Use of Urine Diverting Systems]. Göteborg: Chalmers tekniska högskola Rapport 1999:2.