SITUATED KNOWLEDGES IN THE CREATION OF SUSTAINABLE TECHNOLOGIES

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Introduction

In today's Sweden, sustainable development is seen as both an approach and a goal with self-evident value, and participation by members of society is a necessary resource in this process. Food and meal production are as vital as sustainable development and therefore the combination of the two forms a challenging field of research. Public sector meal production is a huge activity in Sweden; for example, more than 8,500 meals are served each day in the schools and pre-schools of a municipality of 40,000 inhabitants in northern Sweden. Meal production is dependent on various systems, technologies and structures like kitchen technologies, logistics, transportation, infrastructural technologies, water supply, power, tools, information, food-stuffs and refuse collection. How technologies are designed or arranged become ways of building order in a particular practice, as well as in the society (Winner 1985). Cybernetics, that is, theories of control, command and communication, has increased in science and society since the Second World War (Haraway, 1991, Hayles, 1999). A consequence of a society dependent on science and technology is that we live in a time when realities are mediated by visualization devices. Another consequence of a science and technology dependent society is that people are integrated in the circuit of sociotechnical networks where the subjects position themselves or are placed in a position depending on their relationships in a particular situation (Haraway, 1991). Relations such as gender, ethnicity, class, sexuality, age, region, etc., are intertwined with the interactions between humans and non-humans.

In Sweden, meals are served each day in the public sector, an activity where development in accordance with Agenda 21’s four perspectives of sustainability -- ecological, economical, social and cultural -- is of great importance for society (Agenda 21 1992). According to Agenda 21, action is to be taken to promote sustainable development in all areas of society; globally and nationally as well as locally. Local action is emphasised. While local action and grass-roots activities are commended, there are expectations that new, resource-effective technologies will be developed. Technologies involved in the meal production and structures, together with local actors, form a large dynamic web. Agenda 21 implies a great challenge for innovative and system-changing efforts within technology development, especially if we examine the contribution of groups that normally do not have access to the development or the decision-making arenas. How humans use technology and how it is developed or reinvented is ultimately influenced by our values, our dreams, our needs and the condition of our societies. Prospective users are rarely asked about their needs or expectations, even though the users will give the technology meaning (Sejersted 1999).

In this paper, we will examine public meal producers’ and managers’ creation of situated knowledges in the circuits of sociotechnical networks. One of our starting-points is gender research focusing on sustainability, the consequences of sustainability and the necessity of integrating gender perspectives. The integration is needed in the shaping of new understandings -- new technologies -- in order to solve old problems caused by old understandings -- old technologies (Shiva 1989, Hartcourt 1994, Braidotti et al. 1994). The research draws on empirical findings in participant observations and interviews.

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1 The data collection has been conducted by Sara Alander for her doctoral thesis.
Agenda 21 – an action plan

The United Nations Conference on Environment and Development (UNCED) held in Rio in 1992 forms the background for the research project. The report “Our Common Future” (World Commission on Environment & Development 1987) from the Brundtland Commission provided a basis for UNCED ’92, which resulted in a plan of action, Agenda 21. Agenda 21 points out several groups whose role in the attainment of sustainable societies should be strengthened. Among these groups are women, NGOs, business and industry, as well as scientific communities. It is worth noting that, while women as a group are specifically mentioned, men as a group are ignored in the progress toward sustainable development. It is also important to stress that the notion of sustainability necessarily includes not only ecological but also social, cultural and economic sustainability. Hence, the essence of Agenda 21 is to provide an opportunity for citizens to be involved in the creation and implementation of sustainable futures. However, people’s agencies vary in specific situations since an individual can be subordinate in one relation and dominant in another (Mouffe, 1992).

Concepts such as a sustainable society and sustainable development are relevant to numerous disciplines. This has highlighted the following question: What criteria must be considered in determining whether a society is sustainable? Other questions which must be addressed include “who has the power to determine which needs will be met?” and “how and where these needs will be identified?” These questions highlight the fact that sustainability has economic, cultural and social as well as ecological dimensions. Consequently, a sustainable society presupposes gender equality and thus efforts to shape gender equality become central. The development of technology is still a male-dominated sector in Sweden (Udén 2000). But the dominance is not complete; in the mid and late 1990s, feminist researchers pointed out cracks and fissures in the male dominance of the IT sector in Sweden (Roman 1994, Blomqvist 1995, Mörtberg 1997). Despite the changes, it cannot be altogether wrong to assume that even when women use the technology, men have developed it. Therefore, it is important to examine how recommendations and changes aimed at achieving sustainable futures and sustainable technologies influence the living conditions of women and men. Annika Carlsson-Kanyama (Carlsson-Kanyama 1999) and Merritt Polk (Polk 1998) describe in their research how women's lifestyles are generally more resource-saving in terms of sustainability. Based on these observations, women’s lifestyles, in general, seem to offer an advantage in the efforts to implement a sustainable society. Lifestyle changes will be needed in order to achieve sustainability. On the other hand, it is important to change existing norms in order to avoid reproducing the gender system (Hirdman 1998). Adapting prevailing values is not sufficient; changes are necessary and therefore we must move "to redefine the rules of the game so as to make a difference and make that difference felt concretely" (Braidotti 1994).

Methodology

Following Agenda 21, a researcher belonging to the scientific and research community has a specific responsibility to direct her/his research towards sustainability. Consequently, we are part of the problem, but we are also part of the solution (Gulbrandsen 1995). We will

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2 A well-known definition of sustainable development is given in the report Our Common Future (see footnote 3); [to] “ meet the need of the present without compromising the ability of future generations to meet their own needs”. Another, more specific definition is detailed by “The Natural Step”, an organisation working for sustainability with corporations and enterprises. They consider sustainability by for systems. “In the sustainable society, nature is not subject to systematically increasing ... 1) ... concentrations of substances extracted from the earth’s crust. 2) ... concentrations of substances produced by society. 3) ... degradation by physical means. and, in that society ... 4) ... human needs are met worldwide. http://www.detnaturligasteget.se/ July 17, 2003
challenge our understanding of sustainability with our point of departure in local practices in order to examine how to transform visions of sustainability into practice. The focus will be on people's potential to work for change and their contribution in the development of sustainable technologies. The confrontation opens ways to build bridges between different practices, specifically between research and institutional kitchen/restaurants, and local producers. Their knowledge is what Donna Haraway (Haraway 1991) designates situated knowledges. Certainly, knowledge will not be the same everywhere since the concept of situated knowledges suggests that there is no single, universal truth. Different people possess and shape knowledge situated and located in geographical, physical, social and cultural experiences over time. As such, situated knowledge is crucial in order to increase the citizens’ abilities to intervene in the implementation of local sustainability called for by Agenda 21.

People create their worlds through imagination. These are (re)produced in the practices people are involved in or related to in their everyday lives. The rules, presuppositions and assumptions that constitute practices, like public meal production, govern the stories people create and tell in the practice. The stories are historically, culturally and materially dependent and they are not necessarily comprehensive (Haraway 1991). Previous practices and accounts are embedded in the shaping of new practices and thereby in the stories that are shaped within the practices. Thus, stories are valid in the context in which they are created, that is, in a certain time and place. Catharin a Landström (1998:47) argues that situatedness “is about thinking of knowledge-making as a kind of seeing; not seeing as a passive receiving of pictures, but as dynamic, interactive processes”3.

From a democratic perspective, human action and participation are important, but it is also necessary to consider multiple stories or meanings. Citizens’ involvement and participation in the shaping of their lives and futures is a presupposition if the vision is to create sustainable societies and sustainable technologies. Moral and ethical issues play key roles but it is also crucial to examine how meanings are created within dominant discourses, which are discourses that govern who has the right to speak and about what and when. We are inspired by Donna Haraway’s diffraction figure that elucidates how visions and dreams are kept alive, along with various meanings created in local practices. Donna Haraway (1997, 2000) uses the optical phenomenon of diffraction4 to cast light on various meanings or stories that exist at the same time.

Technologies and local agency

A sustainable society presupposes gender equality but significant movements such as women’s lib and the environmental movement, along with other critical traditions, have had only a modest impact on the monopoly of modern science. The demands, proposals and arguments produced by these movements have often been based on new knowledge produced within different scientific disciplines. Criticising science and research can therefore be considered as undermining the movements’ abilities to improve society. Thus, (parts of) the environmental movement adopted the notion of ecological modernisation, formulated as a science-driven model holding out the prospect of profitable socio-economical advantages as solutions to environmental crisis as an alternative to proposing fundamental changes in lifestyles and values. Might this concept bring about a continuing reinforcement of scientific knowledge and a consequent disregard for other kinds of competencies and knowledge?

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3 Our translation from Swedish.
4 Diffraction appears when light passes through a narrow slit and spreads. The light beams and their history of passage through the slit can be registered on a screen placed opposite to the light source.
In the ongoing discourses, the concepts of sustainable development and sustainable societies are sometimes used as if they were interchangeable. It is therefore important to point out that there is a distinct difference between the two. The Swedish government’s aim is to implement sustainable societies, but we cannot possibly create a sustainable society without also implementing sustainable development of technologies. Colin Fudge and Janet Rowe (Fudge & Rowe 2000) discuss the Swedish science-based model, expressing concern about the risk of shaping a new technocracy with an increased distance between experts and lay people. Much effort and numerous measures have been directed toward sustainability projects, primarily relying on a resource-efficient technical fix. For example, a large Swedish investment programme, called the Local Investment Programme, has been criticised for supporting large technical, mainly infra-structural, projects that would have been realised with or without extra investment money. There is still a need to integrate socio-cultural and long-time economic aspects in order to achieve accurate sustainable development. Meal production in the public sector is well integrated in a complex web of technological as well as socio-cultural and economical issues. We will therefore provide the opportunity to voices other than that of the Swedish government to be heard. In these stories, the meaning of technologies, sustainability, gender and agency are created.

Situated knowledges in local practices

We will start with the experience of one of the authors during her first years in primary school. It provides an interesting background to the contemporary situation. A new school had just been built. The whole building was brand new; the cafeteria was airy and bright compared to the old one that had been located in the school basement, and had been originally created as an air-raid shelter. In the new restaurant, we ate with disposable plastic cutlery on disposable plastic plates and drank from disposable plastic mugs. After finishing our lunch – that meant a “clean” plate, no scraps at all – the disposables were thrown away. It was absolutely forbidden to throw away food but acceptable to get rid of huge volumes of plastics every day. This was immediately following the oil crisis in 1973 when, for the first time, people in Sweden had become aware on a large scale of the finite nature of oil resources. So it did not take long before protests against using so much disposable plastic could be heard. Why couldn’t we use the old stainless steel cutlery and the china mugs and plates? Because the new kitchen was not big enough for a dishwasher, which had not been included in the plans! The sticky, dirty, undesirable washing was rationalized into big plastic bags that “disappeared” with the refuse lorries. Today, this scene would be impossible in Sweden where composting (of meal leftovers, for example) is the symbol to many of sustainable development.

This takes us back to contemporary Sweden. Composting has become the norm. Private households have either a composter of their own or pay the municipality to take care of the renewable waste. In schools and pre-schools, the compost is sometimes used as a pedagogical tool in daily activities. This example is taken from a school in a municipality in the northernmost county in Sweden. The compost produced by the school cafeteria is maintained co-operatively by the kitchen workers, one of the classes and their head-teacher, together with a “grass-root” who is a member of an organization that runs a small farm close to the city. The farm allows the pupils to grow potatoes and vegetables that they then sell at an annual market arranged by the school. The kitchen personnel, together with the teacher, have constructed a “leftover collector” where lunch guests can dispose of leftovers. The cafeteria and its staff are thus clearly connected to an activity that has visible impact on the local community. The leftover collector is part of a reasonably small-scale, sociotechnical
network in which the inner circle of involved people has direct contact and ability to influence activity in a way that is lacking in “normal” large-scale public sector compost collecting. The kitchen personnel are obviously proud of the simple but fully functional leftovers collector, which they constructed and, when compared to public sector expenses, is cheap! Through this story we want to make a connection to the questions Donna Haraway poses in *A Cyborg Manifesto*: “What kind of constitutive role in the production of knowledge, imagination, and practice can new groups doing science have?” (1991:169). We also want to respond to her invitation to feminists “…particularly in the production of science and technology that constructs scientific-technical discourses, processes and objects” to be aware of and counteract the “…major social and political danger…” of “…a strongly bimodal social structure…” (1991:169) in which only a limited, privileged segment of humanity has the ability to be in control of their choices in the wave of hi-tech production that tends to interlock every part of our lives.

In the same school, the washing-up equipment filled a room of its own. The dishwasher covered one wall and the two roller conveyors transporting the baskets filled with dirty or clean dishes covered one wall each. Because of its need for a power and water supply, the dishwasher’s engineering context (Bush 1983 & Rydhagen 2002) extends far into the large scale infra-structural systems. While washing up, the machine demanded continuous care and handling by a member of the kitchen staff. Individual students helped to sort and organize the clean dishes. When all the washing up was done, the dishwasher itself had to be washed. This activity would be more easily described with a photo. Washing the machine required a fairly agile, preferably acrobatic, person to reach in and clean inside the long hood. The catering assistant who was responsible for the cleaning spontaneously expressed her opinion that, “This must have been constructed by a man!” The comment reveals the distance between the designer – the legitimate techno-scientist, who is normally a man – and the user, here a woman with techno-scientific knowledge that is commonly ignored during design and development. While washing up and cleaning the machine, the assistant was literally as well as figuratively in “the belly of the beast”.

After these stories about two very different tools and the sociotechnical networks in which they are integrated, we continue by focusing on some processes that have been implemented in all school and pre-school kitchens in a municipality in northern Sweden. In this municipality, the kitchen managers, together with the buyers in three neighbouring municipalities, are now making it possible for small local producers to submit bids on supplying food items. Individual producers might not be able to meet the whole need but, when the resources of a number of these small producers are combined, the order can be filled economically for the municipalities. There is also a consequent strategy to serve more vegetables, both in salads as well as in hot dishes. This holds down costs and also supports the sustainable idea of reducing resource use. All kitchens place their weekly order of foodstuffs and other consumable supplies on a special page on the Internet. The wholesalers deliver the goods to a central store where they are divided and packed for each kitchen, to which the goods are delivered in a small lorry once a week. This is a far-reaching change compared to the situation that existed in the past when each kitchen placed telephone orders to each of the wholesalers (e.g., dairy, vegetables, meat) and the goods arrived several days a week in different lorries or trucks.

A computer was installed in the kitchen and the kitchen personnel were taught how to manage the new way of ordering. Operating a computer was a great challenge for many of the kitchen workers. One woman working alone in a kitchen described how, after trying for two weeks to get 10 kg of clementines and always ending up with 10 kg of canned clementine pieces, she finally realized that she was not responsible for the mistake. The fault lay with the designer of the Internet page, who had no knowledge of foodstuffs.
Discussion

We have argued that it is necessary to develop sustainable technologies to implement sustainable societies. For that reason, we have provided different examples of local practices in technology use and development in public sector restaurants. These examples call for the use of situated knowledges acquired by those who are integrated in the sociotechnical networks connected with the meal production. Again, to use the words of Rosi Braidotti (Braidotti, 1984), it is necessary “to redefine the rules of the game so as to make a difference and make that difference felt concretely”. The “game” is technology development and the difference is about sustainability. Despite the Swedish government’s economic efforts in implementing resource-effective technologies, there are reasons to suspect that this tech-fix alone cannot fully meet the challenging demands of sustainable development. Tech-fix thinking has a tendency to react to the symptoms of technology failure and not its origins. This does not automatically point in a sustainable direction. Rather, there is a risk that the distance between technology developers and its users will increase and thus ignore the situated knowledges.

The woman judging the dishwasher to be a man’s design is an example of this distance. She assigns the responsibility for this impractical piece of machinery to a representative of the other sex. No wonder, since engineers and designers are usually men. One could also say that she places the responsibility on a professional group, consisting of both women and men, that normally remains ignorant of the practicalities in (for example) public sector kitchens. By doing so, they are at a disadvantage when constructing equipment for these kitchens. In the same kitchen, there is a collector for leftovers which, when composted, are used as fertilizer on the farmland where pupils grow vegetables and flowers. The collector is obviously a much “simpler” construction than the dishwasher; for example, it is not and does not have to be connected to any infra-structural supply networks. The local constructors have taken advantage of their situated knowledges, allowing the construction to benefit from its simplicity, making it flexible and easy to handle for all who are connected to the composting circuit.

"Best quality for lowest possible price” is the key sentence for most public sector restaurant managers. The examples of collective bidding by local producers and collective transportation of foodstuffs are examples in which both costs and pollution are reduced without decreasing the ability of the kitchen workers to influence their work. In contrast, computerisation reduces the ability of the person doing the ordering to personalise the order, or to discuss alternatives with the wholesalers. At the same time, the computer makes the worker feel modern and as if s/he is “keeping pace with the times.” It can also make the user feel powerless in the face of the (seemingly) impervious information technology.

As these stories indicate, sustainable technology development has a lot to gain from post-modern feminist thinking. By the use of situated knowledges, diffraction, and the nomadic subject, we have shown how public meal producers are integrated in the circuits of sociotechnical relations and how various stories, images and understandings revealed themselves in local practices. Our aim is to keep these heterogeneous stories alive in order to use them for assessing technologies where the situated knowledges, the dreams and imaginations of all actors integrated in the relevant sociotechnical network are taken into account. Then the techno-scientists might also become accountable for their production of technologies and knowledges. Feminist figurations are useful to counter a too-monolithic picture of sustainability and as a reminder not to underestimate the inequalities or limitations of existing technology.
References


