

## Maximizing the benefits of training engineers about gender

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Gender is an important aspect of multidisciplinary provision of water and environmental sanitation services; however it is not just the responsibility of social scientists, but the whole team. Training engineers about gender has been difficult, or even not attempted due to perceived professional boundaries, but a research project looking into ways gender can be “mainstreamed” into infrastructure development has produced a new way of getting the message across to a technical audience. This however may be in a form that social scientists may not recognize.

### Is gender important?

“Gender” is a way about thinking about society and recognizing that the way women live in a community is different from the way men live – not just due to the physical, biological differences between the sexes, but the way they are taught, treated and trusted. “Gender” is often referred to in the Millennium Development Goals, project documents, policies and principles, for example the Dublin Principles. Principle number 3 states:

*“ Women play a central part in the provision, management and safeguarding of water ”.*

Gender analysis (looking at society and seeing what roles and responsibilities men and women have) shows that in most communities, women (and children) are often responsible for collecting water and carrying out household tasks such as cleaning latrines. The first response to this finding was to try and improve women’s lives by carrying out projects for women alone, designed to improve their living conditions. However this ignored the underlying factors in the way women were viewed by society and as such did not change the fundamental social and economic position of women in the long term.

Women’s workload is often more than men’s and their social position is lower; this is due to the fact that men have more social power than women and therefore women have less of a decision-making role. As such the social, rights-based response is to address this fundamental imbalance in social power. This is done through such actions as:

- Enabling women to take up positions where they also have decision-making power (e.g. on committees, as community leaders and politicians);
- Recognizing the power imbalance is unjust and legislating against unfair discrimination;
- Enabling women to be empowered economically; and
- Promoting the idea of equal rights for women.

These should allow women more of a say in the way society is run, and, by changing society, change the way communities work. As women’s roles change, then either tasks, such as water collection, will be shared, or facilities improve, as they now have a higher importance.

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### **Why is it important to WatSan engineers?**

Social scientists may be interested in the division of power between men and women, but water engineers are tasked with providing a service to the whole community, within the time and budget. Changing “power relations” takes years or even decades. In the UK women got the vote in the early twentieth century, the right to equal pay in the 1970s and yet still they get paid less for work of the same value and are unequally represented in society – with few female politicians or engineers. The time scale of social change and the time scale of a construction project are different orders of magnitude. Within the budgets allocated for water projects, non-core activities that do not improve the delivery of the project have to be justified against supplying more people with more water. These factors indicate that “gender” is not an obvious engineering issue.

However, the basic analysis is that women are responsible for collecting water and cleaning toilets. This is an important piece of information; the people who will be “customers” of the water supply system are more likely to be women than men – at least for the foreseeable future. Thus in marketing terms, women are the group that engineers should be designing for; this is not because it is “right” but because an engineer wants to make sure that the water supply system works – and if the customer cannot use it then it is a wasted investment. A customer-based approach however is still not simple, with many roles within the customer process, e.g.

- the *initiator* (who suggests the purchase);
- the *influencer* (who comments on the decision);
- the *decider* (who makes the decision);
- the *buyer* (who makes the purchase); and
- the *user(s)* (who use the product)<sup>1</sup>.

Within a household, these roles may be played by different people, so power relations are important within the household as well as within society. Community empowerment (women on committees) needs to be matched with addressing economic empowerment and being aware of what influence women and men have over purchases. The people who will be keeping the toilets clean (and thus useable) will probably be women, but the people buying them (and making choices over style, floor material etc.) may not have this as one of their priorities.

### **First do no harm**

Whilst attempts to change society socially may take many years, the provision of infrastructure can have an immediate impact; improved water supplies can save lives, time and money, latrines can improve health and dignity, roads open up new markets and increase prosperity. These are the reasons politicians fund infrastructure projects, in the expectation that life will improve for people.

However things do not always go to plan – or indeed there may be issues that are not on the plan that may be adversely impacted by the construction of infrastructure. Water supplies may deplete water resources, may cause drainage problems, latrines may lead to pollution, road improvements may increase surface runoff and lead to flooding. All of these physical impacts can happen, even if the actual design and construction of the infrastructure is technically correct. Besides the physical

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impacts, there can be social aspects. Water supplies can be unaffordable, latrines may be difficult to clean and empty, roads may lead to increased accidents; these result directly from the building of the infrastructure, and therefore are the responsibility of the team planning and building the project.

### **Why is infrastructure important to women?**

As the main customers for water and sanitation services, are women's needs any different from men's needs? For some issues, there are no differences; a water or sanitation service must be easy for the customer to use, and a man will find cleaning a latrine slab with a poor concrete finish just as difficult as a woman would. A poor man and a poor woman may have the same problems paying bills. For some issues there are clear differences between the sexes – where the physical strength or shape of a woman is different from a man (see photograph 1), or where men and women urinate in different positions.

Some differences may not be so obvious: in societies where women do not have the same freedom of travel as men, the trip to the water source can provide an opportunity to get out of the home and socialize; providing a water supply in the home therefore may reduce the burden of carrying water but will also reduce social activities.

### **Bringing gender and water together**

As infrastructure can have a positive or negative impact on women, policies have been produced to "mainstream" gender issues into the provision of watsan. However good the theory and intent, the practice is not so easy to introduce (Joshi & Fawcett). Whilst the theories and practice of gender analysis may be familiar to social scientists, they will be new to technical staff as they have not been part of general engineering training and so training will be required. Similarly, the economic issues (such as do women have control over payments for water) need to be brought into consideration. Different technical options have different payment methods.



**Photograph 1. The physical differences between men and women need to be considered**

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### **Developing new training techniques**

A research project carried out by WEDC has developed a way of training engineers at work, that focuses on what engineers think about, not the social science. Mainstreaming gender does not mean that engineers become social scientists, but that the technical activities are carried out with an awareness of social science issues. Engineers are still primarily responsible for technical activities and social scientists for community work, but working together to a common goal. Consider such a delicate matter as the disposal of sanitary towels during menstruation; the disposal of the waste is technical (requiring engineering skills), but the subject area is very difficult to discuss with the users (requiring social skills).

### **The research methodology**

The project started off with a conventional training programme; this focused on the social science rather than engineering issues. Problems occurred though with attracting engineers to attend the programme. One workshop that did engage with technical staff showed that, whilst the engineers were aware of gender issues, they did not have the technical responses required. A case was given of a project where a woman had been appointed caretaker of a water system, but she was unable to climb the water tower to maintain it as she wore a sari (long dress). The problem was a technical one, as the engineers did not know how to re-design the water tower to suit the user. The focus shifted from looking at "gender" activities to looking at what engineers do in their day-to-day job.

Following this workshop, a series of courses were held with a range of technical staff, to test a new approach to training engineers about gender, using lots of discussion with the participants to see what their views were. In one case, discussing the issues with managers from Nigerian water utilities, the rights based approach was welcomed by the women on the course, but was treated with opposition by the male participants. A pragmatic, customer based approach however, whilst not as emotive, was accepted by all as a positive way forward.

### **The training methodology**

The training developed has some underlying principles that make this approach different from standard gender courses.

### **Reasons for considering women**

The rights-based approach did not appear to be relevant to the work engineers carried out, so the reasons for considering the needs of women are based around meeting customers' needs, project efficiency and effectiveness. It was important to capture the engineer's imagination to make them want to take action. This is founded in one of the early definition of civil engineering, namely:

*'the art of directing the great Sources of Power in Nature for the use and convenience of man*

*(Thomas Tredgold 1827)*

This is supported by research by Narayan (1995) that showed that participative projects were more successful than non-participative projects. Research shows that women are consistently the main collectors of water in non-commercial situations. Women are therefore required on decision-making committees, not to fill a quota, but to provide specific direction to the engineering process. The first step is getting them on committees; the second step is engineers actually engaging with

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these groups representing the customer and discussing design decisions, such as technical specifications. Internationally agreed principles and national laws and policies are mentioned, but only after explaining why they have been developed – and rights based advocacy has a role here.

Everybody experiences problems with having limited opportunities in life because they are too old/ young, rich/ poor, sick, from the “wrong” social, religious, cultural or ethnic background. Having had direct experience of this, engineers can relate to the problems of power-relations in society and the idea of vulnerable or socially excluded groups. Vulnerable groups have less of an opportunity to influence public decisions but are still valid customers of public infrastructure services – indeed they are often very reliant on these services as they do not have the resources to access adequate water supplies (for example), on their own (i.e. richer people may be able to buy water).

Social scientists need simple indicators to identify vulnerable groups; women and the poor are consistently socially excluded in most societies and this makes social analysis efficient – in the same way that engineers use simple indicators for soil conditions and rock types.

### **The engineer’s role**

An engineer does not have the same job as a social scientist and the time-scale of a standard engineering intervention is not the same as that required for sustainable social change. Identifying what the engineer feasibly can do is therefore important. Some of these actions will be to support social scientists, such as ensuring adequate representation of women, but the engineer’s main role is in the provision of infrastructure.

One example comes from a training session in Zambia, where experienced staff had been on gender training courses over several years. They accepted that consulting with women and ensuring women were on committees was a regular aspect of providing a water supply. As part of the workshop, the participants drew up engineering specifications for a pit latrine, from the perspective of:

- A hydrogeologist;
- A health official;
- A building contractor;
- A local political leader; and
- A woman with a baby.

All the specifications were different; when asked what they used in practice, they stated that the standard design was 20 years old and only reflected technical aspects – the needs of the user (which they were aware of as they had just written a specification reflecting these) were not included in the design. A sound technical design such as a VIP did not specifically ensure the latrine was large enough, had handholds where needed, was easy to clean and was light enough to see inside. The gender training they had experienced had limited “gender responses” to social science activities and had not included technical responses. The need to consult with women is not because the project

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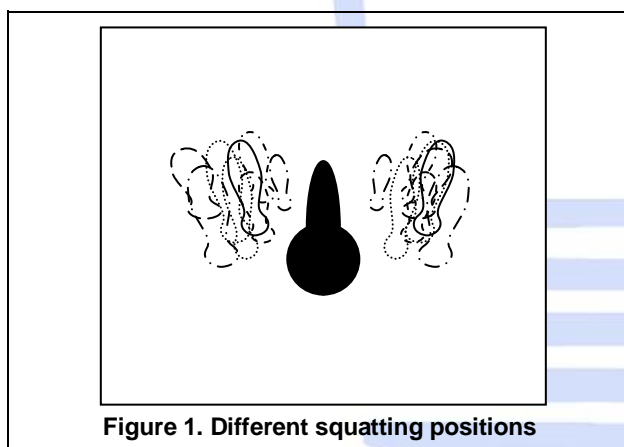
manual or law requires it, but because it is a method of ensuring the design meets the customer's needs.

### **Engineering cycle**

The training material developed is for engineers and uses engineering examples, including ways to involve women at various stages in the engineering process, including construction. This makes gender awareness a thread that runs through the process, and not just limited to consultation. Often this thread gets broken as the project is handed over from the identification stage (dealing in principles and policies), to the design and implementation phase (dealing in specifications) and then to the operation phase (dealing in procedures). The need for gender actions need to be transferred from stage to stage in a way that is relevant to the people in charge of the next stage. Thus principles have to be made specific if they are to be included in the terms of reference for a consultant. If they are not specific or not understood, they cannot be implemented or even measured. This approach also challenges the normal concept of an engineering "client" – making the engineer a link between the funder or promoter (a government body or private company) and the user.

### **Physical and social**

The engineering response to gender actually has two aspects; whilst gender is a social concept, biological (sex) differences are also important and much more recognisable. These are also easier to demonstrate than the "hidden" nature of social discrimination. One practical example used is to design a simple pit latrine slab. A sheet of paper has a "keyhole" drawn on it and the tallest and shortest people in the group are invited to squat over the hole and the outline of their feet is drawn onto the paper, to show the physical variation in squatting positions. Then a (male) participant is invited to squat over the hole – but this time with a cushion or bag filled with a weight tied to his stomach – imitating pregnancy. The problems with balance and being able to see his feet are physical issues that the engineer can address with handholds, adequate lighting and good footrests. The exercise can be repeated by making somebody physically impaired in another way – such as asking them to use crutches and again identifying physical actions such as providing sufficient space inside the latrine.



**Figure 1. Different squatting positions**

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The exercise however also demonstrates some social aspects, such as the problems some people may have with talking about these things in public and the need to talk about these subjects in single-sex groups or to go behind a screen to squat over the paper.

### **Delivering training**

One of the problems found during the research was attracting engineers to a “gender” course, so two actions were taken; one was to rename it – such as “Infrastructure for All” – making the relevance to engineers clear. The other option was to mainstream the training so it was integrated as part of a longer course or became part of engineering work practices – with checklists and action points for meetings included as alternative methods of getting the message across.

A challenge is to make the course interesting and engaging; engineering training is normally very fact based and logical. Thus a mixture of techniques is used, such as setting out a logical and well-supported argument for diversity and social exclusion, practical exercises allowing the participants to use their engineering skills (such as discussing the infrastructure information provided on communities’ maps of their town) and also some limited, less structured activities such as role play. This has to be carried out carefully, and again relate to the engineering process – based on engineering activities such as design parameters rather than less tangible aspects, such as empowerment. This is not to say that issues of empowerment are not important, but that they need to be introduced, at the pace of the learners.

### **Measuring impact**

One of the problems with mainstreaming gender is that it has to lose a gender-specific focus, so measuring the gender impact becomes difficult. Rather than simplistic approaches to count participation and inputs to the engineering process, a mainstreamed approach requires an assessment of the infrastructure itself, so disaggregated data (responses from men and women) on customer satisfaction with the outputs of service is needed.

### **Learning points**

- Training engineers about gender needs to include why gender is important to engineers. It needs to start off with why infrastructure is important to women. To help engineers understand the issues, the subject has to be relevant to their work
- The training has to focus on infrastructure that is appropriate to the needs of women
- Techniques are available to introduce these concepts to engineers- based on engineering activities, rather than basing the training on socio-economic issues such as rights or policies.

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**Note/s**

The training pack giving details of this course is available on <http://wedc.lboro.ac.uk/>

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