Case studies

1.1 Introduction

These case studies have been collected as part of a project to bring issues of social exclusion in the practical development of infrastructure in low-income countries into the core of project planning and design. They have been used to influence and illustrate the guidelines that have been produced as part of the research.

The case studies are being set out here to provide a resource for engineers and the trainers of engineers. They can either be used as a supplement to the training notes produced under the project or used separately to provide illustrations of the overlap between gender issues and the development of infrastructure.

One of the problems in collating the case studies has been the lack of *engineering* issues. There are many case studies of the importance in considering the needs of men and women in the development of infrastructure, but these have come from gender studies rather than mainstream civil engineering. This leads to the impression that gender issues lie outside of the core of project development and design, forming a specialist area requiring specific expertise. In contrast, many engineering examples do not bring out social issues explicitly, so there is a gap between "gender" knowledge and "engineering" knowledge that these case studies and associated books and booklets aim to bridge.

1.2 The studies

The case studies have been kept short, to make them accessible and useful as part of larger initiatives. They have been edited slightly to bring out the engineering issues, rather than other aspects, such as politics or rights based actions. A comment is provided to expand on some the lessons that can be drawn from the case study.

The studies are grouped according to sectors:

- water resources;
- water supply
- sanitation
- solid waste
- transport
- irrigation
- construction
- management and organization
- emergencies
- hygiene activities

Within each section, the case studies are grouped according to the project cycle (planning, feasibility, design, construction, operation and maintenance, evaluation).

1.3 Other project outputs

- For a short introduction on infrastructure and its impact on people, see *Building with the Community (WEDC 2002)*
- For guidelines on how on engineers can include gender issues in their work see *Infrastructure for All (WEDC 2002).*
- To train engineers and technicians to meet the needs of men and women see *Developing Engineers and Technicians* (WEDC 2002)
- Website: http://www.lboro.ac.uk/wedc/projects/msgender/index.htm

1.4 Referencing

The case studies have been provided by a wide ranging group of people over several years. Some are personal observations or have been extracted form published or unpublished reports. Attempts have been made to identify the originator of these extracts, but this has not always been possible. If you know the original source of a case study, please contact Brian Reed (details below), in order that credit can be given.

1.5 New Case studies

If you have examples of engineering issues that have a gender or social exclusion aspects, that you think would be useful additions to these case studies, please contact Brian Reed (details below).

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WATER RESOURCES

Case study 1

Who is the water for?

1.1 Background

The small town of Felidia in Valle Province, Colombia uses a mountain stream as the source for its piped gravity water supply system. To treat the surface water the community has installed a multi-stage biological treatment system. The catchment area of the mountain stream is used for forestry and irrigated agriculture, for which fertilisers and pesticides are used. There are also some fishponds, which are filled with streamwater.

The catchment area is the home of some 100 families. These use the same stream for drinking water, tapping into it with either individual gravity systems or small group systems. They are not connected to the main gravity supply, as this would involve pumping. The catchment area is further becoming popular with the city population of Cali (2 million inhabitants) for open-air recreation during the weekends. Wealthy inhabitants also build summerhouses in the township. The water and land use patterns of these different interest groups impact on both the quality and the quantity of the water. The houses in the catchment area have latrines and pigsties draining directly into the river area. Soil erosion from land clearing for forestry and agriculture has increased the turbidity of the water to such an extent that the treatment system gets clogged. It is increasingly difficult to deal with the chemical and bacteriological pollution. The women in the town in particular have problems with the poor quality of the water. The households in the catchment area are however not willing to change as this would affect their livelihood and they would not benefit directly from the change. Nor does the availability of water keep pace with the demand in the town. The rich summerhouse owners use much water, as many houses have a swimming pool. Being the biggest beneficiaries of the flat water rate, they have so far resisted all attempts by the original population of the town, united in the local water board to change the tariff system. In this they are helped by their strong economic and political ties to those in power in the city. The ones most affected are the women of the common town households who initiated and built the supply. Their water is inadequate in quantity and quality because other than the weekend visitors they need water seven days a week and have no large reservoirs for storage and sedimentation and because the low tariff does not allow the capacity of the scheme to be enlarged. Efforts have now started to seek compromises through a more integrated watershed management in which all interest groups are involved.

van Wijk et al., IRC 1996

1.2 Comment

Social and economic groups may have different priorities. In this case study the poor were suffering due to the practices of the rich and influential. The poor women suffered in particular as they had more involvement with the water supply than the men.

Case study 2
Household size

2.1 Background

A water and sanitation project in Uganda was collecting data on population. When the data was analysed it was not clear what the figures represented. All the figures were higher than a similar survey carried out in the feasibility stage.

- Many children were at boarding school and it was not certain if they were included in the data or not.
- Similarly, the children of relatives who lived in Kampala, the capital, often stayed in the village, being looked after by grandparents, uncles or aunts. Were they in the village household or just visiting.
- Men working in the city would also consider the village their home, so did the census figures include them?

2.2 Comment

Data collection is important, but cultural perceptions of age and gender could lead to confusing results.

Brian Reed

Case study 3

How to miss project goals

3.1 Background

A case study of traditional water sources and handpumps in a Singhalese village in Harispattuwa in Sri Lanka showed that women used different traditional sources for different purposes. They emptied, cleaned and repaired shared open wells. Siting, use and management of traditional water sources was based on practical knowledge and rituals.

3.2 Action

In a handpump project, no attention was paid to these cultural aspects, and the poorer sections of the community were not served. Half of the pumps were not used because of difficulty of access or dislike of the taste of the water. Because the women were not involved in the project, they transferred age-old rituals and maintenance practices to handpumps, which reduced the pump efficiency. Although women were represented on local councils through their organisations, they did not have a voice in the higher level of project committees that made all the decisions. The women were not considered for positions as pump caretakers as preventive maintenance was considered too technical for women.

Water Supply and Sanitation IT Source Book Water Supply 1996

3.3 Comment

If the project goals are to provide water for villagers, the project team needs to identify the physical, social and economic barriers that may prevent the whole community have access to the system.

Case study 4
Representation on committees

4.1 Background

Research in Nkayi, Zimbabwe showed that only men were on dam committees (for cattle watering); whereas hand-dug wells, used primarily for domestic purposes, were almost the exclusive domain of women. At boreholes, used for both purposes, the use was mixed and conflicts arose over the priorities of different users, with cattle watering generally taking precedence over domestic use.

4.2 Comment

Although the individual committees reflected the users of each facility well, a institutional solution needs to be found to allow equal access to the boreholes. Alternatively, two boreholes could be supplied, one with animal troughs and one with washing slabs, to provide an engineering solution to the problem.

(Cleaver, 1991) IIED Gatekeeper Series No SA49 – 1995

Case study 5

Water delivery systems and household water needs

5.1 Background

The term 'drinking water' is broadly understood to include water for 'domestic needs' and thus it is assumed that water provision through drinking water systems will address multiple water needs at the household level. However in most cases, the water systems designed and provided are not reflective of water provision for various domestic needs and at best address only drinking water needs. Further, in the absence of a consultative planning and designing process the systems are also insensitive to the specific needs of the users.

A common complaint by women both in Orissa and Uttar Pradesh was that hand pumps provided as water points are difficult to use especially by very old women, very small children and pregnant women. Also in most projects there was an unstated but explicitly professed norm that the water from the handpump was safe for drinking and therefore handpumps were to be used 'carefully' (interpreted by the community as to be used only for collecting drinking water and water for cooking). Even in places where there was an attached platform provided for washing activities, there would be arguments and contradiction amongst women if clothes or utensils were washed or if people took baths at this water source. This conflict was seen to intensify in places where water scarcity was high.

5.2 Comment

In such cases, the most vulnerable amongst the women; single women with many children, women with additional responsibilities at home (with sick and/or disabled/old members) and outside were seen to use these 'safe' sources the least. This was seen to be primarily due to the lack of time to make separate visits to separate water sources for various needs. Thus such women used the most convenient source, like an unprotected well or spring for all purposes.

Case study 6

Traditional water sources meet multiple needs

6.1 Background

In Mayal village in the Uttar Predesh hills, the traditional water spring (the Naula)was located below a small hill, well sheltered with large trees in the vicinity and built on two split levels. The upper portion had a large flowing tap and a raised platform to keep containers used for carrying drinking water. Water drained from this tap to a lower level tank and then into a basin before it finally flowed out through channels in the fields. Water from the upper tap was used for drinking. Water in the lower tank was used for bathing and the small basin was used for washing and rinsing clothes. The trees apart from other ecological advantages adequately sheltered the women while bathing.

6.2 Action

Contrast this with the new structure designed by a Rural Water Supply and Environmental Sanitation Project. Here the tapstands were open rectangular platforms with two taps, having no complementary arrangements for maintaining privacy. A discussion with the women revealed that they some used the still functional traditional naula (located further than the new tapstand) for bathing, washing clothes, others carried water home in buckets from the new tapstand for these activities. This led to several visits to the tapstands in contrast to earlier practices, where one visit to the naula was adequate for all purposes. Further discussions revealed that there had been no discussions of the technical team with the women on specific designs. Engineering staff when consulted said '*project design does not enable such flexibility in design'* and *'These women always seem to ask for more, they are never satisfied with what they have.*'

However, it is interesting to note here that many times new technology has been able successfully to minimise the social stigma of untouchability which is seen to more prominent and ritualistically followed in the use of traditional water delivery systems. Thus scheduled caste women denied access to use traditional systems have been able to use new systems

6.3 Comment

Complex social issues can be disrupted *and* enhanced by simple technical interventions.

Case study 7

Local information on water sources

7.1 Background

In the Uttar Pradesh hills, an expert hydro-geologist with 30 years experience found that local people were more reliable in identifying underground springs than trained technicians. He thus built upon these skills introducing environment-friendly technologies in which hand pumps drew water from collection chambers fed by such springs in hilly, water scarce areas.

7.2 Comment

Conventional technical expertise may not be the most important factor in assessing water sources.

Uttar Pradesh UNICEF Mainstreaming Gender

Case study 8

Planning for local conditions

8.1 Background

In Kenya, the lake basin development authority deals with two types of zones - the highlands and the plains. In the plains, latrines are difficult to construct. They must be lined otherwise they cave in. This challenge applies to the water wells too. Culverts are used to reinforce the walls. In the highlands the project deals with spring protection. The aim is to increase water volume and provide separate sources for animals and for domestic use. People know local conditions and are ready to do extra work or make good training and management arrangements when they are taken seriously. Because each group has different tasks, expertise and interests, both men and women need to be involved in this process.

8.2 Comment

Natural resources vary locally. Expertise will have been built up locally to cater for the prevailing conditions and this knowledge can be valuable in planning water projects.

Case from Joyce Mbare, Kenya Today IRC Occasional Paper 25 1994

Case study 9
Siting hand dug wells

9.1 Background

A study was undertaken of a well construction programme in Sierra Leone. It was found that social and cultural differences were as important in explaining the minimal impact of the well digging scheme as the fact that the wells were dry for periods of the year.

9.2 Action

A few gender based observations were made including:

- Many women observed that they commonly transacted confidential business relating to women's activities in the course of collecting water. Such discussions were impossible around the improved well sited in a public place in the village where men could observe or overhear.
- In the village where the improved well was located outside the mosque, it was only used by men, and then only for the ritual of washing feet before beginning prayers.
- One chief persuaded the aid officials to locate the well in his compound. Consequently no men visited the well for fear of having to give unpaid labour to the chief, and unmarried women stayed away for fear of being drawn into being another wife of the chief.

9.3 Comment

- Social and cultural attitudes should be considered when siting communal water points, in order to ensure that the facilities are fully utilised by all members of the community and that users have no objections to their location.
- All members of the community should have opportunity to contribute to deciding on the location of suitable water points.

Ref: Bah, O.M., Hollis, G.E., & Richards, P (1991) The socio-economic impact of improved wells in Sierra Leone, J.IWEM, 5, February

Case study 10

Synchronising technical and social components

10.1 Background

Achieving optimal synchronisation of technical and social outputs is difficult. The pace of technical and social inputs has not always been synchronised or effective. Sometimes the technical work is too slow, sometimes the community mobilisation is too slow. For the Bomani dam in Kenya, it took the organiser several months to develop trust and convince people to commit themselves (including Ksh 43,000) and gather materials for rehabilitation of the dam.

10.2 Action

The technical teams and heavy earth-moving equipment arrived two months later. By that time people had dispersed, lost interest and faith. The community organiser had to start all over again, trying to convince people that she was not a 'messenger of lies.'

More careful planning of needed technical equipment and the inclusion of senior social staff on management committees has since facilitated synchronisation of technical and social inputs.

(Kenya People Pumps and agencies KWAHO PROWESS/UNDP 1988)

10.3 Comment

If the engineers are not involved in the community and social aspects of a project, they will not be able to integrate their parts of the scheme with the work of their social science colleagues.

Case study 11
Spring selection

11.1 Background

In a village near Bukavu, Zaire a spring was protected through a local development programme. On visiting the village at a later date, some of the women were asked if they were happy with the work. They replied that they were not as the protection had been undertaken on the wrong spring. The one developed dries up in the dry season whereas another one on the side of the village flows all year. They had not been consulted before the work was done.

11.2 Comment

Consult all interested parties before implementing programmes, especially the main users of the facilities, if money is not to be wasted.

Lila Pieters