

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 from 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).

1.6 Acknowledgements

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- | | | |
|------------------|-------------------|------------------|
| ■ Peter Sinclair | ■ Lizette Burgers | ■ Sarah House |
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Brian Reed, Editor

b.j.reed@lboro.ac.uk

WEDC,
Loughborough University,
Leicestershire,
LE11 3TU
UK

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Case study 1

Learning the lessons

1.1 Background

In examining gender relations and the allocation of irrigated land Burkina Faso, the following lessons were learnt.

- Allocating smaller plots separately to men and women instead of allocating bigger plots to the household heads had positive production and social benefits.
- When both men and women have irrigated plots, the productivity of irrigated land and labour is higher than that in households where only men have irrigated plots.
- Women are equally good or even better irrigation farmers than men and those who have obtained irrigated plots are proud of their increased abilities contribute towards the needs of the households.
- Women prefer to contribute to their households by working on their own plots rather than providing additional labour to their spouse's or to the collective plots.
- As women become economically less dependent upon their husbands, they can help support their family and increase their own opportunities for individual accumulation of wealth in the form of livestock.
- The effect of having an individual plot significantly improves the bargaining position of a woman within a household and is a source of pride in the household and community.

(abstract of: A Plot of One's Own: Gender Relations and Irrigated Land Allocation Policies in Burkina Faso Zwartveen, M. 1996.)

Case study 2

Who drives the programme?.

2.1 Background

In Comoros, a rice irrigation project objectives clearly articulated the protection of women's land rights. However, tight construction schedules required rapid expropriation of land. This was endorsed by the local elite who signed agreements to lease the land to the state for 99 years.

2.2 Action

The engineers designed 'household plots' assuming a unitary family farm and assuming that land was to be allocated to the male household head. Only at the end of the construction phase did the project hire a legal expert to arrange land allocation. Then it was too late for an inventory of former land rights. Moreover, by then, these elite groups had already consolidated their power in the Water Allocation Committees that were created at the instigation of the project. As a consequence, the elite, and their wives, obtained disproportionate access to the improved plots in the pump irrigation scheme. The change in resource rights, namely a localised land reform, was far-reaching and visible.

(More Jobs per drop Targeting irrigation to poor women & men. B Van Koppen)

2.3 Comment

The assertion that 'the population' participated in decision-making is no guarantee that the poor were included. Just counting the women involved may have shown that women were on committees, but the needs of the poor would still not have been addressed.

Case study 3
Paper pushing

3.1 Background

Many projects are designed to include women, but the actions have to realistic.

3.2 Action

In the Mahaweli Irrigation System in Sri Lanka, the solution for assisting women was the establishment of an envelope-making project. Lack of adequate marketing assessment led to the director of the irrigation agency having to 'save' the project by generously buying all the envelopes.

3.3 Comment

In this case, the project had attempted to involve women, but did not involve them in either the irrigation or a sustainable enterprise based on their needs.

(Zvartveen 1993)

Case study 4
Farmers and builders suck the
ground dry

4.1 Background

In the first week of November 1996 India's Supreme Court ordered the central government to draw up plans to regulate the use of groundwater. The ruling came after a case brought in by an environmental lawyer who warned that the lack of regulation was causing groundwater levels to fall dramatically and wells to dry up. As a result hundreds of thousands of people go short of water while the government pumps millions of Rupees into rural water supply development. A study, for which the court had commissioned the National Environmental Engineering Research Institute (NEERI), confirmed that in some regions groundwater levels are falling at an alarming rate. In parts of Delhi, Punjab, Haryana, Rajasthan and Gujarat drops are between two and four metres in recent years.

4.2 Action

The lawyer brought the case to court because in most regions there are no laws controlling the number of wells or their depth. Three years ago the previous government produced a draft bill that would have tightened controls over the use of groundwater. But its passage through parliament was blocked, allegedly through obstruction from rich people contractors and farmers' lobbies. Only a few states in India have taken steps to control the construction of wells. But even these measures have not been able to prevent affluent farmers, builders and industrialists from constructing wells in critical areas says the NEERI. It makes a series of recommendations for tighter controls. Meanwhile in Delhi, a recent report by the Ministry of Water Resources found that not only were groundwater levels dropping but the water was also becoming badly polluted. In some areas of the city the concentration of nitrates in groundwater is around 1 gram per litre -10 times the permitted level for drinking water.

(Tara Patel New Scientist, Issue 47, November 1996 quoted in Gender in Water Resources IRC 33E).

4.3 Comment

Water resources should be available to all, not just to those who have the strongest voice in society. Policy at a national level can contribute to more equitable access to water. The government had to pay for new rural water supplies, because the farmers were able to take the groundwater without paying the external costs of depleting the resource.

Case study 5

Allocating land

5.1 Background

In Burkina Faso women and men each have their own organisation with rights to water and land for agriculture: the women in the river valleys, the men on the higher grounds. When the state took over the land for irrigation it only gave out plots and water rights to male heads of households and only male water users groups were created.

5.2 Action

The (male) water user groups did not maintain the water supply system, as unlike the women they were used to dry agriculture. The women lost their production and harvest rights, saw their traditional organisation not recognised and lost motivation to spend much energy in agriculture. When the government realised this new plots were given out also to women and productivity as well as operation and maintenance of the watercourses improved.

(More jobs per drop B Van Koppen 1994)

5.3 Comment

Here a lack of recognition of the existing status of women not only reduced their status in society, reducing their rights, resources and representation, but had a real economic cost in lost productivity and food security.

Case study 6

Services for women are not additional

6.1 Background

When Grameen Krishi Foundation (GKF) realised that women are highly involved in farming and that women are able to make much more income when given support to farm compared to with the returns to labour in traditional female activities, it shifted its gender strategy in 1992 from the development of specific activities for women to “mainstreaming”. This shift was aimed at more directly involving female farmers in irrigation activities of GKF. GKF makes irrigation services available to either groups or individuals.

6.2 Action

The GKF services may be in the form of access to deep tube well or shallow tube well irrigation water or in the form of access to irrigation technology (shallow tube wells, treadle pumps, or hand tube wells). It is often difficult for women to fully enjoy the benefits of access to irrigation, because their access to other resources (land, credit, seeds and fertiliser) and services (technical information and marketing) is constrained. For this reason, GKF also attempts to provide these resources directly to its members. GKF negotiates with landowners to secure land lease arrangements on behalf of women; it provides seeds, fertiliser and agricultural credit, technical training, and marketing services.

The mainstreaming strategy of GKF is gradually showing signs of success. Female involvement in its irrigation-related activities has increased dramatically, from being almost nil in 1992. The study shows that women are very interested in and capable of managing irrigation equipment and irrigated crop production. In spite of some difficulties, all the women somehow involved in irrigation-related activities are very enthusiastic. The seasonal net income from irrigation ranges from Tk 1,000 (in the case of a treadle pump) to Tk 5,000 per woman, which is high when compared to what they would have earned as wage labourers (about Tk 500 per season). Many women have plans to expand the scope of their earnings even more.

(‘A well of one’s own’ Jordans & Zwartveen 1997)

6.3 Comment

The case study illustrates how it is possible for NGOs to overcome in-built discrimination towards women by providing services directly to female members.

Case study 7

Inequitable access to funds

7.1 Background

Agriculture is the backbone of the Lao economy. Approximately 3/4 of the labour force derives the bulk of its employment and income from this sector. The predominant crop is glutinous rice. Yields are low due to vagaries of weather and traditional production methods. Shifting cultivation methods was also having negative environmental consequences.

A project in Oudomsoy and Luang Namtha provinces of the Lao People's Democratic Republic's aims were:

- Long term: to increase incomes of targeted communities by making lowland irrigation schemes more productive and thus to reduce shifting cultivation on the area of hillsides.
- Immediate: to modernise existing traditional irrigation schemes, thereby expanding the irrigated areas. Sustainability to be achieved by strengthening village level management and production capability and by building up the capacity of local firms and government institutions to support them.

7.2 Action

During implementation gender representation was considered in the definition and constitution of committees. Men were put in charge of the Irrigation Committees and women were members of the Rural Development Committees that were responsible for the formulation and supervision of community infrastructures such as drinking water facilities, schools and rice mills financed by the Village Development Fund. Nothing explicitly prevented women from becoming members of the Irrigation Committees but they were not encouraged to do so or to become active members of the technical committees dealing with agriculture and cattle raising. The definition of women's role in the development contract was also rather restrictive linking women's activities to women's development 'priorities' (kindergarten, sewing, weaving, kitchen gardens, small animal raising, nutrition and health).

There were very few creative initiatives by the project to help women take decision-making power in agriculture, which was surprising since the main ethnic group is matrilineal. An evaluation mission felt that the project should have modified its blue print for composition of the committees to give women more responsibility as they interviewed groups of people from both genders and not only were women vocal, but men always asked women to provide answers on key questions such as those on land distribution.

Within the village credit committee, women are also given a minor role and the credit they get in practice is limited. The women tended to get small loans for activities such as sewing or weaving (ceiling of 70 USD: approved by the Rural Development Committee). The men tended to get loans for bigger things such as buffaloes, land clearing and agricultural production (ceiling of 420 USD: approved by the male Irrigation Committees). Nothing prevented

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applications to the alternative committee but in reality the women were convinced that if they should want a more substantial loan their husbands would have to request it.

Priorities by women as noted in the project document were:

- running water in the village;
- kindergarten;
- rice mills;
- dispensary or midwife;
- electricity;
- contraception;
- livestock immunisation; and
- weaving development.

However irrigated rice fields and buffaloes were omitted from this list even though they were actually given as high priorities. The surveyor's view was that agricultural activities as well as other requested priorities are often income generating and would rather profit the better off. The fact that the main characteristics of poverty in the area are lack of rice fields and of buffaloes and that men could have access to both resources through the project does not seem to have weakened the surveyor's certainty.

In reality the women's priorities were:

- running water in the village;
- rice fields;
- buffaloes; and
- rice mills.

The eventual main uses of the Village Development Fund were:

- kindergartens;
- some latrines;
- buffalo stables; and
- weaving and sewing training.

The slippage between the need's assessments and the infrastructures actually built explains, to a large extent, why none of them operated satisfactorily.

7.3 Comment

- Needs assessors should be careful in making assumptions and modifying stated needs and priorities.
- The project should be designed taking care not to strengthen inequity and the imbalance of power.

Case study 8
Rich, poor, poorer

8.1 Background

In Bangladesh, with an abundance of groundwater, large farmers were the first to benefit from state subsidies to install deep wells with mechanised pumps. When shallow wells and smaller pumps became available irrigation technology came within reach of the smaller farmers. The latter used water more efficiently than the large farmers, from necessity to survive, and so gained a surplus. This they sell to others. Now even landless farmers and women have united and bought pumps to sell water for agriculture.

In Bangladesh agriculture, men have access to water technology and land to mobilise labour, arrange inputs and have the ultimate say over the harvest. Continuing exclusion of women from the developments in water technology has widened the gap between the haves and the have-nots. But as water vendors, women have found opportunities to benefit from the new technology

(Koppen, 1997).

8.2 Comment

Is it possible to go further than just considerations of simple efficiency when considering women's participation in the project cycle activities?

Case study 9

Women' s needs identification

9.1 Background

Bangladesh depends on agriculture to provide employment for well over half of its workforce. Intensification of food grain production was accompanied by rapid expansion of irrigation following the deregulation of groundwater development in the late 1980's. Hence a large number of deep tubewells previously owned by the Government were available for private ownership. A few NGOs also acquired and operated deep tubewells to safeguard access of small farmers to water and to secure an equitable distribution of benefits of the privatised assets. The Grameen Deep Tubewell Irrigation Project is an example on a significant scale of such an undertaking. The ownership of the wells meant that owners also were free to consider technical options for their farming.

9.2 Action

- The project's components included a women's support programme as well as the establishment and support of an NGO, GKF, and deep tubewell selection and improvement. The 'Women's Support Programme' (WSP / WID) included the employment of project staff specifically to work supporting groups (both women's and men's) and the provision of credit along with other activities.
- Wage rates were on average lower for women than men. This was partially explained by the nature of the work versus labour charge, but different rates were also given for the same types of work in some cases.
- The programme was involved in the release of mortgaged land amongst poor farmers and assistance in cultivation and crop and seed production for both men and women. Women in general had only marginal access to plots in the command area of the deep tubewells. Therefore, the project focused on providing other minor irrigation facilities through credit and training, as an option to increase women's access to plots outside the command areas e.g. it allowed the purchase of shallow tubewell or treadle pumps.
- In discussions with female farmers it became evident that access to land and water was a very high priority. Examples have been seen of women rising from landless to farmers made possible through the intervention of GKF acting as an intermediary between landlord and landless women in negotiations as well as guaranteeing the mortgage be paid.

9.3 Comment

Consideration of women in all phases of the project as a specific issue, can reduce the inequity that often exists in projects that tend to mainly focus on men.

Case study 10
Gender in local IWRM

10.1 Background

In recent years good practice gender perspectives in drinking water supply and sanitation, irrigation and the management of catchment and flow areas have developed. The Traditional Irrigation Project in Tanzania is one such project. Female and male staff and women from one of the mixed water users' associations gave a presentation on it. In Tanzania 70 per cent of the labour in agriculture is done by women. Locally established irrigation systems guarantee food production even in times of drought. These are threatened by overpopulation and environmental degradation, thereby putting food production and livelihoods at risk. The project addressed irrigation, soil and water conservation and strengthened local organisation with an emphasis on their gender approach aimed at more equitable roles for women and men.

10.2 Action

The results: 26,000 farmers, 45 per cent female and 55 per cent male, participated in improving their irrigation and land and water management. Together they improved almost 8000 hectares of irrigated land and 4600 hectares for land conservation. Furthermore, 166 water user groups, with female and male members, strengthened their organisational and technical skills.

10.3 Comments

The benefits of the gender approach: women got access to water for irrigation as well as domestic use, which they previously did not have.

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Case study 11

Importance of women's time and
labour to project success.

11.1 Background

In many examples from Africa the lower than anticipated availability of female labour has depressed the size of area cultivated, and the yields gained from irrigation schemes. For example in an irrigation system in Cameroon intra-household conflicts over control of income from rice production led to women minimising their labour contributions to the irrigated rice crop controlled by their husbands in favour of their individually controlled sorghum production. This led to negative effects on rice production.

Jones 1983 and 1986 quoted in Zwarteveen 1993

11.2 Comments

Many factors determine food production. Labour is one important issue. Irrigation schemes may fail to reach their potential if labour, especially women's labour, is not addressed.