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# **Infrastructure and Poverty: A Gender Analysis**

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## **Acronyms**

DGIS	Netherlands Development Co-operation Agency
ECFA	Engineering Consulting Firms Association
EDI	Economic Development Institute (World Bank)
FDI	Foreign direct investment
FHH	Female-headed households
FRP	Feeder Roads Programme (Mozambique)
ILO	International Labour Office (Geneva)
IMT	Intermediate means of transport
IRC	International Research Centre on Water and Sanitation (The Hague)
ITDG	Intermediate Technology Development Group
IWTC	International Women's Tribune Centre (New York)
JDI	Japan Development Institute
NGO	Non-government organisation
NMT	Non-motorised transport
Sida	Swedish International Co-operation Agency
SIP	Sectoral Investment Programme
SSA	Sub-Saharan Africa
UNCHS	United Nations Centre for Human Settlements
VLTTTS	Village level travel and transport surveys
WCC	Women's Construction Collective (Jamaica)

## 1 Executive summary

Infrastructure provision has typically been a top-down process dominated by technological concerns and with little engagement in socio-economic debates on development. There is increasing awareness of the failure to provide adequate or affordable infrastructure facilities and services for low income users and of the potentially negative social impacts of inappropriate provision. Various factors, including inappropriate technological choices or regulatory standards, harassment of informal sector providers, lack of property rights and access to credit, poor maintenance and management systems and subsidies benefiting the better off, limit the access of the poor to infrastructure provision, many of which have particular impacts on poor women. The introduction of market principles into infrastructure provision has led to a renewed focus on demand, with the potential to make services more user-responsive. However, there is also a danger of new forms of inequity being introduced.

‘Pro-poor’ interventions tend to focus on community based provision, with simple, low cost technology and user participation. There is a tendency to impose organisational models for infrastructure development in low income communities, which overlook existing networks and initiatives. More recognition is needed of the diverse organisational forms involved in infrastructure services provision and management in poor communities and the ways in which gender and other social divisions and interests (e.g. caste, class) are represented in these. Greater attention is also needed to intrahousehold processes and decision-making which lead to gender differences in use and control of infrastructure facilities and services. Poverty and equity concerns are also relevant to the regulation and management of parastatal and privatised utilities and mechanisms, through, for example, health and safety controls, policy towards the informal sector, employment and training opportunities and accountability to users.

Mainstream debate has focused on the implications of gender roles for particular sectors, notably water and sanitation, where women have a major role and where there are social externalities to investment through improved health. Women’s participation is seen as essential to render these interventions effective and experience suggests that creative approaches are needed to ensure this. More recently, attention has turned to the transport sector, in recognition that a major part of low income, especially rural, women’s time is used in transportation for both domestic and income generating purposes, often without access to technologies or services which would facilitate this. However, assumptions about potential time savings resulting from infrastructure investment need to be carefully reviewed. Complementary investments may be required to realise economic or social benefits. Other sectors of infrastructure provision, e.g. telecommunications, would benefit from a gender and social analysis.

Planning and management of infrastructure provision exhibit gender bias, for example, in the priority given to improving the mobility of vehicle owners, more likely to be male. A review of criteria applied in prioritising and evaluating infrastructure development interventions, would assist in identifying areas of gender bias. The move towards sector investment programmes in infrastructure development underlines the need to ensure that: sectors are defined in ways which take account of women’s (as well as men’s) activities and priorities; procedures for contracting out services take account of gender and social impacts; and training and employment opportunities for women are promoted, not just in low level or manual jobs, but also in technical and management roles.

## **2 Mainstream debates on poverty and infrastructure**

### **2.1 Infrastructure: definition and approaches**

Infrastructure has been defined in terms of the physical facilities (roads, airports, utility supply systems, communication systems, water and waste disposal systems etc.), and the services (water, sanitation, transport, energy ) flowing from those facilities (Sida 1996). Fox (1994) defines public infrastructure as ‘those services derived from the set of public works traditionally supported by the public sector to enhance private sector production and to allow for household consumption’. The importance of infrastructure as an instrument of economic development and, potentially, poverty reduction, is reflected in the high level of investment which national governments and international donor agencies put into infrastructure development<sup>1</sup>.

Infrastructure provision has traditionally been the preserve of engineers, with planners focusing on meeting technical goals related to operational efficiency, rather than goals related to economic development or poverty reduction. Technical experts employing similar methodologies have implicitly assumed that conditions in developed and developing countries, or between one place and the next, are similar. Infrastructure ‘has been marginal to socio-economic development debates’ (Cottam 1997: 68) and there has been little attention given, until recently, to the impact of infrastructure provision on different social or income groups.

Inefficient provision and maintenance of infrastructure and basic services in developing countries, exacerbated by debt and economic restructuring, have led to the introduction of new forms of ownership, management and financing in infrastructure provision, which is no longer seen as the exclusive preserve of the public sector (Levy 1991). The introduction of market principles into infrastructure provision has led to renewed interest in the demand for infrastructure services, in contrast to the earlier focus on supply. Current policy debates focus on three interlinked aspects of infrastructure provision:

- access and appropriateness;
- financing and cost recovery mechanisms;
- community participation, ownership and management.

In the context of economic liberalisation and macroeconomic development, infrastructure provides an enabling environment for the productivity of households and firms. Infrastructure provision also has important implications for equity and poverty (Levy 1991; Singh *et al.* 1996; Fox 1994; Sida 1996).

### **2.2 Infrastructure and poverty linkages**

There has been much debate about whether current infrastructure service provision benefits the poor. Some evidence suggests that certain types of infrastructure service provision, e.g. roads and transport, have a potential contribution to agricultural output, and that infrastructure improvements (in electricity supply, transport and telecommunications) in small towns

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<sup>1</sup>Investment in infrastructure was found to represent around 20 per cent of total investment in a sample of low and middle income countries, and to account for 40 -60 per cent of public investment (UNCHS 1996). Individuals, private firms and NGOs have also made substantial investments.

contribute significantly to industrial growth and employment<sup>2</sup>. At a community or individual level benefits can accrue to the poor if labour-intensive methods of construction are used rather than capital-intensive methods (Sida 1996).

**Box 1: Infrastructure and poverty linkages**

- Public infrastructure of acceptable quality stimulates economic growth and is a prerequisite for economic and social development. The quality of infrastructure and service provision is important in attracting foreign direct investment (FDI), with the potential to generate new employment opportunities. Research generally finds that infrastructure capital has a positive effect on economic growth and output in developing countries (Kessides 1993b; Fox 1994).
- Access to a range of basic infrastructure services (e.g. clean water, sanitation) is often regarded as an indicator of well-being (Sida 1996).
- Infrastructure services can reduce poverty through health improvements, for example, by improving water and sanitation, which decreases incidence of illness, and associated lack of productivity.
- The way in which infrastructure is financed influences the distribution of income in society (Sida 1996). Price subsidies to public utilities and parastatals usually benefit the well-off and industry more than the poor (*ibid.*). Infrastructure provision such as better transportation and water services can be very effective in raising incomes of some people (depending on region, income group) (Fox 1994).
- Construction of infrastructure facilities may lead to employment opportunities for the poor, or, alternatively, to a loss of jobs. Labour-based methods in the construction and maintenance of infrastructure provide employment and incomes for poor people (Howe and Richards 1984), but in some cases workers may lose their jobs, e.g. where a new source of electricity leads to the introduction of labour-saving technology (Fox 1994).

Box 1 illustrates the potential contributions of infrastructure services to poverty reduction. While there is considerable evidence that infrastructure development is correlated with economic growth, there is less evidence to support a positive impact on poverty. In general, non-poor households rather than poor households seem to benefit more from public infrastructure investments (Howe and Richards 1984; World Bank 1994; UNCHS 1996). In Bangladesh, for example, non-poor groups receive over 80 percent of public expenditure on infrastructure (Sida 1996: 81, citing Kessides 1993a). Moreover, infrastructure development can have negative impacts on specific social groups, due to displacement, environmental pollution and health risks and loss of livelihood, for example. Generally, the urban poor are increasingly situated at the periphery of cities where access to city facilities and job opportunities is restricted.

### **2.2.1 Accessibility of infrastructure services**

Analyses of poverty and infrastructure services show how in many developing countries, the poor's access to infrastructure is limited, and cite numerous examples of self-provided infrastructure, e.g. assembling materials to build shelter, purchasing water from vendors, as a response to the lack of access to publicly provided infrastructure.

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<sup>2</sup> An important ingredient in China's success with rural enterprise has been a minimum package of transport, telecommunications and power provision at the village level (World Bank 1994).

Devas (1991) suggests that a host of factors explain why existing infrastructure interventions fail to serve the poor:

- the inadequacy of provision in relation to the huge scale of need;
- the relatively high standards adopted, which means either that the poor cannot afford what is offered, or else that a substantial subsidy is required which the government cannot afford;
- any subsidy element is likely to accrue either to higher-income groups, or to the public officials who administer infrastructure services;
- failure to address the fundamental obstacles which the poor face in gaining access to land and basic infrastructure;
- inappropriate forms of infrastructure and services, together with inadequate resources for operation and maintenance, which means that services do not effectively reach those who need them, or fall into disrepair and disuse;
- the adoption of policies which discriminate against the poor or impede them from improving their situation, such as regulatory standards which are unaffordable by the poor, and harassment of informal sector providers.

Subsidised provision of infrastructure is often proposed as a means of redistributing resources from higher income households to the poor. Yet its effectiveness depends on whether subsidies actually reach the poor (World Bank 1994). Arguments for the removal of subsidies has drawn on research illustrating the ways in which the poor are currently paying up to 100 times more for services than those connected to the formal system (e.g. the poor use kerosene instead of electricity for lighting, buy water from private vendors rather than public standpipes) (Cottam 1997). However, infrastructure subsidies can be designed to improve their effectiveness in reaching the poor. For example, for water, increasing block tariffs can be used: charging a low rate for the first part of consumption then higher rates for additional blocks of water. Subsidising access to public infrastructure services is often more useful for the poor than price subsidies (World Bank 1994; Sida 1996).

The recent popularity of cost recovery<sup>3</sup> approaches to financing infrastructure is supported by feasibility studies which have shown that people are willing to pay for certain services, and the fact that many poor people do pay more for services. However, problems of the sustainability of community financing, affordability and access are not adequately considered (Yeung 1991). Furthermore, the poor's lack of access to credit limits the people from initiating and contributing to micro-level strategies, such as upgrading their dwellings or paying for connections (EDI 1991).

### *2.2.2 Institutional development and participation*

Recent debates on infrastructure provision and poverty alleviation place institutional reform of service provision high on the agenda. It is acknowledged that new forms of technology require new institutions to implement them. There has also been more attention on the need to incorporate 'civil society' participation in the design and implementation of infrastructure and service provision. This reflects the 'new orthodoxy' of creating an enabling environment, capacity building and the 'need to let ordinary people take charge' (Cottam 1997).

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<sup>3</sup>Cost recovery refers not only to the financial measures for initial outlays but also to long-run maintenance and operating procedures.

The World Bank sets out four main institutional options (Kessides 1993a):

- public ownership and operation by enterprise or department;
- public ownership with operation contracted to the private sector;
- private ownership and operation often with regulation;
- community and user provision.

Possibilities for pro-poor intervention are generally focused on community based provision, with simple, low-cost technology often proposed as a solution. However, poverty and equity concerns are also relevant to the regulation and management of parastatal and private utilities, as well as to local level solutions. Private sector operators are driven by efficiency and profit, rather than equity concerns, but regulation is needed to ensure the maintenance of facilities and safety standards, or that pricing and payment mechanisms do not discriminate unfairly against particular groups, for example. Public sector enterprises face similar pressures, although in theory they could be made more directly accountable to poverty and equity concerns (Sida 1996).

Cottam (1997) argues that technological 'blueprints' for infrastructure provision (often linked to external finance and international tendering procedures) are now being supplemented by organisational blueprints which ignore local realities. She suggests the need for understanding of infrastructure provision from a socio-cultural and historical perspective, as well as a flexible approach to new institutions and to appropriate 'anti-poverty' interventions, drawing on a multiplicity of local forms of organisation, initiatives and resistance.



### **3 Gender issues in mainstream debates on poverty and infrastructure**

Infrastructure planning and policy has been treated largely as a technical exercise, with, until recently, little attention to gender issues, or to wider social and environmental factors. However, the negative impact of some kinds of infrastructure development in terms of social, economic and environmental factors has led to greater attention to gender issues. Poverty issues are increasingly addressed, through greater attention to delivering low-cost infrastructure services for low income groups with more emphasis on appropriate technologies. Closely linked to this is increasing emphasis on participatory goals in programme planning and implementation. It is now commonplace to refer to the need for (poor) women's participation in local-level infrastructure development projects, as one aspect of the wider requirement for community participation<sup>4</sup>.

Growing attention to gender issues in mainstream infrastructure provision is based on the identification of gender-differentiated preferences, roles and responsibilities, and therefore differentiated needs for services. Focusing more infrastructural investment on services used by and appropriate to women will, it is hoped, reduce demands on women's time and/or improve their own or other household members' health and welfare, with significant poverty implications. Much of the literature categorises women as a separate, 'hard done by' category that warrants special attention in infrastructure provision.

The extent to which gender issues are taken on board varies depending on the nature of the service, the extent to which it is perceived to be closely associated with pre-existing gender roles or norms and to have positive social or environmental externalities. For example, water and sanitation services are often seen as 'female' activities and to have considerable potential health benefits. Thus, much work has been done to develop gender-sensitive policy and practice in this sector (see Baden 1993 for a summary). In the energy sector, the benefits of improved energy facilities are often perceived in terms of time freed from collecting firewood (again, a 'women's' task) and, potentially, reallocated to other productive activities, as well as in terms of reductions in environmental degradation.

By contrast, interest in gender aspects of transportation is relatively new in development debates, and is concentrated on rural Africa, where it is seen as important in improving agricultural productivity and supply response, because of the predominance of women as rural producers and in agricultural marketing (Levy 1991; World Bank 1994; Bryceson and Howe 1993; Calvo 1994a, 1994b; Barwell 1996). Other sectors, such as telecommunications, have not yet been tackled from a gender (or poverty) perspective in developing countries.

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<sup>4</sup> The issues raised by this emphasis on women's participation are addressed in the next section.

## **4 Why a gender perspective is important**

### **4.1 Gendered roles, needs and preferences**

Gender-based divisions of labour, as well as cultural norms and perceptions of security, are reflected in patterns of activity, behaviours and preferences, so that poor men and women may have very different priorities in terms of infrastructure development. Similarly, infrastructure development may have different significance for and impacts on men and women. For infrastructure facilities and services to be effective, users must be differentiated on the basis of gender and other social factors.

For instance, men and women may have different preferences regarding sanitation facilities, and they often have varying roles in household hygiene management. Women are generally more concerned with privacy and safety, and so well-enclosed latrines in or near the house may be a higher priority for them than for men (IRC 1994). In a project in El Salvador, women would not use the toilets designed by male engineers because a gap left at the bottom of the door exposed their feet and offended notions of privacy (IWTC 1982, cited by Moser 1987).

There are considerable differences between the travel patterns of men and women (although current travel patterns may not reflect actual needs) (Turner and Fouracre 1993; Levy 1991). Evidence from village-level travel and transport surveys (VLTTS) and case studies in Africa showed that the major part of the household transport burden falls on women, who contribute to 65 per cent of the total transport effort related to agriculture, although their involvement in the latter is seasonal (Barwell 1996). An urban study in Brazil (Schmink 1982, cited by Turner and Fouracre 1993) showed that women's trips to work accounted for one-third of all work-related trips, while women were responsible for at least half the non-work trips. Other studies suggest that women are more likely than men to combine several purposes into one trip (trip chaining). A study of a resettlement scheme in Delhi showed that the ability of women to get to work from new locations was disproportionately affected compared to that of men, suggesting that women's travel patterns had not been considered.

### **4.2 Gender differences in access to and control of infrastructure facilities and services**

Current patterns of activity, however, are not always desirable and gender divisions may be reinforced by inappropriate infrastructure provision. Research suggests that there is differentiated access to, use of and control over infrastructure facilities and services by men and women, linked to inequalities in intrahousehold relations, property rights and cultural restrictions (Doran 1990). Bryceson and Howe (1993) point out that infrastructure development tends to assume that infrastructure improvement and introduction are key to alleviating transport problems. Yet in reality some attention needs to be paid to households' internal management of infrastructure and issues of control and access.

Women are suppliers of transport in terms of portage; and as owners of both motorised and non-motorised transport. However, they are under-represented in the operation of transport technology, not as active as men as commercial drivers, nor in the operation of hand-pulled trucks (Amponsah *et al.* 1996). In Africa, load bearing is primarily the responsibility of women, as well as girl children (Agarwal *et al.* 1994). Women perform the function of transporting goods without the assistance of technology; men typically do so with the aid of technology

(*ibid.*). Surveys on the impact of intermediate means of transport (IMT)<sup>5</sup> in Sub-Saharan Africa (SSA) show that, in general, there is a reluctance by men to allow IMT to be used for 'women's work' (Barwell 1996).

Access to infrastructure is often determined or influenced by gender-based constraints such as cultural restrictions which can constrain women's use of roads, or mobility, as in the case of Nepal where women are restricted from travelling long distances by cultural norms. Cultural norms may also restrict women from using public transport, riding bicycles, or obtaining instruction licences for vehicles. Petty traders in urban Ghana (among whom the majority are low income women) face harassment or obstacles to their use of bicycles as a means of transport, even though this might save time and income (Amponsah *et al.* 1996):

Women cyclists talked of the abuse they experienced from motorists. They told of being deliberately pushed off the road by vehicles, of being shouted and hooted at and of being jeered at and ridiculed for daring to bicycle on a public road (*ibid.*: 4).

It has been observed that many women will avoid any attempt to board a heavily loaded bus, preferring to wait for another. Sexual harassment, height of entry steps, or the absence of a rail present particular problems to some women, e.g. sari wearers.

In some areas where cost recovery schemes have been introduced, rates of recovery have been low, partly because affordability studies based on men's incomes have often ignored the possibility that women pay for a substantial portion of water costs. The introduction of cost recovery has led to certain households, particularly female-headed households (FHH), being excluded from access because fees are set too high (Green with Baden 1994). In male-headed households, women might be willing to pay for infrastructure services, but because of patriarchal decision-making processes or biases in intrahousehold resource allocation, may be unable to commit resources to such an investment (*ibid.*).

Women's relatively weak property and tenure rights over housing and land mean that they face barriers in securing access to land for building, that the benefits of infrastructure improvements which increase the value of property may not accrue directly to them, or that loans for infrastructure improvements are harder for women to secure in their own right.

#### **4.3 Time use, productivity and social or environmental externalities**

The heavy demands on women's time and energy of domestic transport requirements (e.g. for fuel and water collection, childcare) or maintenance tasks which result from lack of investment in appropriate infrastructure provision, have consequences for personal and household welfare. Domestic transport (for which women are largely responsible - see Table 1) accounted for 31-63 percent of total time spent on travel and 38-90 percent of energy, in four studies in Africa. Women are also involved in other transport activities, e.g. in headloading agricultural produce. In total, women account for 65 percent of all transport activities in the rural household, measured in time, increasing to 66-84 percent when measured in effort (Calvo 1994a: 7-9).

In poor households, the 'trade off' between income earning activities and domestic activity for women may mean increased health risks, or using children's labour (often girls') to substitute

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<sup>5</sup> IMT are those means of transport which are intermediate between the traditional mode of walking and modern convention vehicles, i.e. wheelbarrows, animal drawn carts, bicycles.

for mothers. This was found in urban Ghana where girls' schooling was jeopardised by mothers using them to transport goods for trading, so as to avoid long delays which might disrupt their sales (Turner and Kwakye 1996).

**Table 1: Division of transport responsibilities in a typical household (percentage)**

	<i>Ghana</i>			<i>Zambia</i>		
	<i>F</i>	<i>M</i>	<i>O<sup>6</sup></i>	<i>F</i>	<i>M</i>	<i>O</i>
<b><i>Domestic transport</i></b>						
<i>Time</i>	70	6	24	96	1	3
<i>Effort</i>	71	6	23	96	1	3
<b><i>Total transport</i></b>						
<i>Time</i>	63	24	13	66		
<i>Effort</i>	66	19	15	72		

Source: adapted from Calvo 1994a: 10

Conversely, appropriate infrastructure provision may release women from time-consuming tasks, which can then be invested in economic or socially beneficial activities. There is considerable evidence of time savings from improved infrastructure provision. However, Kaminga (1991, cited by Green with Baden 1994) points out that there may be a tendency to overestimate the benefits to women of improved water supplies and to underestimate their costs. The assumption that time is saved does not always hold. In particular, where community management of water is conceived as women's responsibility, time spent collecting water may be replaced by time spent collecting school fees or attending meetings.

As yet, few empirical studies exist to demonstrate the gains in terms of alternative uses of women's time, or social externalities from investments in infrastructural improvements, e.g. water and sanitation (see e.g. Calvo 1994a: 48-9; Barwell 1996: 29-30). These benefits may require additional support in order to be realised, e.g. credit or access to markets for income generating activities, or health education: 'simply providing new [water] facilities does not necessarily lead to changes in usage or practices which lead to improved health' (Baden 1993:1). In some instances women may, understandably, choose more leisure time rather than additional work.

#### **4.4 Biases in infrastructure planning, management and employment**

A gender analysis of infrastructure services is important to understand how assumptions about gender run through each stage of infrastructure planning and to appreciate how this may result in the creation of infrastructure facilities and provision of services that fail to meet the needs of women in poor communities. Biases in infrastructure planning and development in part related to the lack of involvement of women in planning processes, either in technical or managerial roles, or through consultation processes.

The bias towards mobility rather than accessibility evidenced in the data collection and performance evaluation methods used throughout transport planning, tends to favour certain forms of transport provision. Planning for mobility enhances gender biases in that it tends to focus attention on improving the conditions of those who are likely to be more mobile already, i.e. vehicle owners, who are more likely to be male.

<sup>6</sup> The category 'O' meaning other, stands for any mixed combinations of men and women, including children.

Until recently infrastructure provision, in general, has been dominated by top-down planning focusing on technical goals. This has in some cases resulted in infrastructure provision totally inappropriate to the needs of the poor - needs which are based on a range of factors at the individual, household and community levels. Beall (1997), drawing on research into waste management in South Asia, suggests that the micro-politics of the household and residential waste management need to be recognised in policy formulation and planning. This will both make management more effective and create a stronger anti-poverty focus in urban services management.

Examples of design faults and inappropriate technical choices ignoring gendered needs have been highlighted by feminist critiques. Moser (1987) points out that 'women's work can be adversely affected by the introduction of services totally inappropriate to their needs, as a result of lack of prior consultation'. For example, water pumps introduced to provide clean water have broken down because handles were designed for use by men, and women and children (the principal water bearers in the community) broke them through their inability to operate them. Similarly, ignoring the importance women place on safety, security and privacy may result in inappropriate infrastructure provision.

Labour-intensive forms of infrastructure construction have been linked to employment creation (and thus poverty reduction), but often do not offer the same opportunities and benefits to women and men (UNCHS 1990; Turner and Fouracre 1993; Levy 1991). The available statistics confirm that women in Latin America and SSA play a small part in the formal construction industry while their counterparts in Asian countries play a considerably larger role<sup>7</sup> (ILO 1996). However, women's labour contribution to the formal construction sector may be channelled through the family or community, and is concentrated in the informal sector, so that official data tend to underestimate their involvement.

Explanations for gender biases in construction range from patriarchal culture/attitudes, exclusion from training<sup>8</sup>, the nature of construction work, the work environment etc. (Shah 1993; Menendez 1991). The development of formal construction trade training, initially through apprenticeship and later through modern vocational training programmes has usually reinforced the exclusion of women from the direct income benefits that construction work generates (UNCHS 1990).

Women's involvement in the construction industry is further constrained by sexual segmentation in the labour force. Wells (1990) points out that women are more likely to be employed in clerical categories, occupying low positions, while men are concentrated in production-related tasks, and in technical and managerial positions. In India, women in the construction industry are employed mainly as unskilled workers and restricted to manual work. Slotted into the category of 'helpers', their work mostly involves carrying headloads of construction materials (earth, mortar, bricks, cement etc.). The more skilled and highly rewarded work is carried out by men (*ibid.*). There is little opportunity for the advancement of women from helpers to other levels. In Bangladesh, women from different socio-economic groups sometimes occupy positions as engineers and architects, but they are few. However, this pattern is not uniform:

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<sup>7</sup> For instance, in South Asia women labourers are employed in road construction and maintenance. In one of Bangladesh's main road maintenance programmes, women comprised the bulk of the workforce (World Bank 1994).

<sup>8</sup> In Jamaica, for instance, over 1,000 women were trained in building skills between 1976 and 1980 when the educational system was based on co-educational facilities. When the policy was changed in 1981 to centralised single-sex residential training, women were effectively excluded from training in the building trade.

Wells (*ibid.*) finds that Thailand, Bangladesh, Sri Lanka, Indonesia and Korea have more than 50 percent female employees in production-related jobs.

In general women's average wages in construction are lower than men's, partly due to sex-segregation. A number of surveys of employment conditions within the industry also suggest that women manual workers are paid less in similar positions to men (Sabha 1987; Sinha *et al.* 1975; Fernando 1985, cited by Wells 1990; Shah 1992).

With the increasing recognition of significant gender differences in requirements of shelter and access, more attention is being paid to women's participation in public sector building. Another area of potential employment or income generation for women is in the manufacture of building materials. Similarly, female participation in public works is now recognised as an important means to reduce poverty.

Increased involvement of women in construction does not always bring financial benefits and in some cases places more burdens on women. A road maintenance programme in Lesotho paid women for their maintenance work only in food, perceiving them in their reproductive role. Programmes which rely on unpaid community participation often expect women to provide voluntary labour. In self-help housing projects, or public works schemes, women are often relegated to 'secondary chores' such as carrying water, wetting bricks, mixing mortar, or tidying verges (Wells 1990).

#### **4.5 Community participation**

Community participation tends to assume a homogeneity of community interests, but communities have socially differentiated interests determined by gender, class, age, ethnicity etc. Community participation does not necessarily translate into women's participation. There are several inter-related factors that can lead to gender-based disincentives to participate in project activities. Dhanapala's (1995) study of the gender-differentiated impact of village-level micro-hydro technology in Sri Lanka found that institutional problems and conflicts, leadership styles and attitudes to women, the economic role and activities of women, and lack of household support in subsistence activities were some of the factors hindering women's participation in infrastructure projects.

Where community participation is seen as a formal process (e.g. involving water committees or NGO facilitation) this can lead to the exclusion of women, who may have dominated less formal, pre-existing networks, as Cottam found in low income areas of Lusaka (1997: 74).

## 5 Implications for policy and practice

### 5.1 Towards gender-sensitive infrastructure services

The demand orientation of new approaches to infrastructure policy implies that infrastructure services provision will be more responsive to consumers or users. While this may have more scope for redressing gender imbalances, there is the danger of introducing new forms of gender bias. The delivery of infrastructure services requires gender-sensitive policies and strategies at macro- and micro-levels. Infrastructure planning requires sectoral and cross-sectoral linkages that take gender issues into consideration. Gender considerations need to be placed at the core of key infrastructure policy debates which revolve around: ownership; financing; decentralisation; equity versus efficiency goals; formal versus informal provision and choice of technology.

Sectoral investment programmes (SIPs) related to infrastructure development (e.g. in transport, for example, in Tanzania) are now being promoted (particularly by the World Bank) to improve donor co-ordination, local ownership, and provide more comprehensive coverage (World Bank 1995). This implies a shift away from direct involvement in projects to broader policy concerns, including regulation, management systems, human resources development. It is important that: gender issues are taken into account in the ways that sectors are defined (e.g. the inclusion of transport for domestic purposes and consideration of travel needs in women's activity patterns); systematic mechanisms for monitoring gender and other social impacts of infrastructure provision are developed; and training and employment opportunities for women are promoted, not just in manual and low grade jobs, but also in technical and management grades.

#### **Box 2: World Bank support to non-motorised transport (NMT) in urban Ghana**

Increases in the costs of public transport following privatisation and poor levels of infrastructure development in low income areas are factors behind the Ghana Urban Transport project in Accra. The project has two main components, designed to alleviate the burden of personal and commercial transport costs to the poor, through:

- improved access to depressed areas in Accra;
- construction of appropriate infrastructure to facilitate NMT, particularly bicycles.

However, obstacles have been identified to the benefits of these activities for women because of negative attitudes (highlighted above) towards women's use of bicycles. In the long term, the project is attempting to counter these attitudes and strengthen the capacity of the Department of Urban Transport to address gender barriers to women's use of NMT.

*Source: Amponsah et al. 1997: 5-6*

The consequences of infrastructure delivery need to be fully considered since men's and women's interests and needs differ. Plans for introduction of new technology for water conservation, road construction etc. should be informed by findings of the increasing literature on technological change and gender. Predicting the impact of infrastructure on women and men requires a close understanding of the details of their activities, opportunities and constraints, as Box 2 on the Urban Transport Project in Accra illustrates (World Bank 1994). For example, new road networks may create opportunities for women to exploit new markets, or may lead to an influx of cheaper products without creating alternative economic alternatives, dislocating their trade. Collecting gender-disaggregated data to assess the likely impact of new

infrastructure may avoid reproducing gender biases. Consulting both men and women and promoting their participation in new infrastructure development is vital to ensuring that new facilities and services are appropriate to their different needs (ECFA/JDI 1993).

Bilateral and multilateral programmes aimed at housing and basic services are paying more attention to the needs and priorities of women. Sida, Norad and ODA<sup>9</sup> are cited as examples of bilateral donors focusing on the needs of women in infrastructure provision (UNCHS 1996; ECFA/JDI 1993). Lessons can be learned from the experience of attempts to promote gender-sensitive approaches in sectors such as water and sanitation. Van Wijk (1993) (cited by IRC 1994) argues that effective strategies are gender-specific in that they recognise existing and new roles for men and women. Actual divisions are much less sharp and more fluid in times of change. She distinguishes nine areas where a gender approach can be fruitful (see Box 3).

**Box 3: Gender-sensitive strategies for water and sanitation provision**

- Contacting women in needs assessment, because sanitation is more urgent for them
- Consulting men and women on the choice of acceptable and affordable technologies
- Giving both genders a say in the design and location of facilities
- Involving men and women in construction and financing, because the expertise of men and women in these areas differ and conditions differ for married women and female household heads
- Dividing work in construction and maintenance of sanitation facilities equitably between men and women, boys and girls
- Ensuring that women can also get technical training, as the acceptability of their presence in private compounds and their commitment to the work makes them excellent sanitation workers, e.g. in Lesotho, India and Pakistan
- Involving men and women in health education, as sanitation projects will not succeed without their support and behavioural change
- Ensuring that men and women can participate in sanitation improvements
- Measuring change in sanitary behaviour of men and women

## **5.2 Managing infrastructure, employment and training needs**

The emphasis on institutions, community participation, improved management and financing structures may have potential for more recognition of women's needs and interests. For example, the focus of new policy on decentralisation and participation in water resources management 'implies increased sensitivity to local conditions and priorities thus the possibility for greater user involvement and influence over the planning and design of new services, with potential benefits. However, this depends on the extent to which a gender analysis is applied' (Green with Baden 1994).

The decentralisation of the management of infrastructure services requires educating and training staff at all levels and ensuring that women participate equally in education and training programmes. Representation of women among decision-makers and policy-makers of public and private sector construction sectors may eliminate barriers to women's entrance to other levels of the sector. Anecdotal evidence suggests that there is general consensus that the appointment of women project managers will contribute to improvements in both project performance and the situation of women workers who are employed in the construction industry (Shah 1993). In the field, agencies such as Sida and DGIS are attempting to introduce gender-

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<sup>9</sup> Now the Department for International Development (DFID).



sensitive policies and employment practices in parastatal newly privatised utilities, such as electricity and water companies, for example, in Mozambique. This includes emphasis on the representation of women among technical and managerial staff, and on training opportunities for women employees, as well as gender training for personnel at all levels (Ann Pedersen, Mieke Oldenburgh, personal communication).

The type of training or the way it is carried out may affect women's ability to take on paid employment. In Grenada, a lower entry qualification disadvantaged women when it came to seeking employment (see Box 4). Even in cases where women have access to appropriate training they may fail to find employment opportunities because of stereotypical attitudes. Further support in securing employment may be required as in the case of Jamaica (see Box 4).

**Box 4: Building-related training and employment for women**

In 1987, in Grenada, unemployed women were encouraged to attend a non-traditional employment preparedness training programme where women were introduced to different kinds of non-traditional work for women, including the building trade. This gave them time to explore within a supportive environment, some of the issues related to women's entry in non-traditional areas.

However, a further initiative had mixed consequences. Women who did not have the academic qualifications to be eligible for building-related courses were encouraged to attend a special women's only training course. This gave them the opportunity to catch up with men, but put them at a disadvantage because it was widely known that entry-level standards were lower.

In Jamaica, the Women's Construction Collective (WCC) in 1983 was set up to help women find employment at the trade level in the building industry. Low income women were trained by the Collective in basic building skills and carpentry. The tools necessary to start work were provided through a revolving-loan fund. Contractors initially employed the women as labourers, but, because they were highly trained and had their own tools, most were soon promoted to being trade helpers.

*Source:* UNCHS 1990

Experience suggests that training is not enough. It must be accompanied with plans to provide employment, or provide women help to secure employment, as well as other measures to ensure that women are provided with the facilities that they need in order to enable them to work in the industry (Wells 1990). Women need to be paid whilst training, and during the construction of their homes. Special assistance with childcare, family pressures, and support in dealing with attitudes of male workers is also required. Andersson (1991) proposes management and entrepreneurship training to encourage self-employment.

### **5.3 Financing infrastructure services**

The costs to women of new infrastructure services may be alleviated somewhat if appropriate supports (e.g. credit) are made available. Increasing the incomes of the poor (women) through income-generating activities may also enhance their ability to demand and pay for infrastructure services.

However, gender biases in access to finance (see Box 5) and in property rights are structural barriers to women's ability to pay for the infrastructure services they need. These barriers may be exacerbated with the development of private land markets. Housing schemes and community based infrastructure projects need to consider ways to promote women's rights over household and community assets, by registering properties in women's names, or encouraging women's groups to register titles to land for infrastructure development, for example.

#### **Box 5: Financing home improvements**

In Lusaka, Zambia, it was found that because of their low incomes women benefited more from squatter upgrading projects than from sites and services projects. Women were more willing to spend on housing than men, but fewer women qualified for loans because the criteria were based on average incomes and women tended to fall in the lowest income category. Women were found to be more responsive in paying arrears for housing loans and plot charges. However, it was difficult for women to travel the long distances required to make the payments, and the business hours conflicted with other demands on their time at work and in the household. Women showed better repayment rates than men on several low income credit programmes.

In Zimbabwe, sites and services projects have benefited more women than in Zambia, but the proportion of female heads of households qualifying is still low. While sites and services schemes with public sector credit provision enabled more women with informal sector income to qualify, the gain has been eroded because of the transition to private sector (building society) credit, where more rigorous proof of income is required

*Source:* Menendez 1991

#### **5.4 Enhancing women's participation in infrastructure development**

A gender approach emphasises the need for both women and men to participate in decisions and functions at different levels. Additional measures for increasing women's involvement in providing infrastructure may be necessary. However, special attention to women may be strongly opposed by men.

In a rural water project in Zambia, men were jealous of women's preferential access to training courses. They in turn tried to prevent the participation of women. In Laikipia, a semi-arid region in Kenya, 24 women's groups built more than 600 rainwater tanks in four years. Before the project started the women's groups were studied. A participatory assessment showed that women could not travel for group training, and that men would take over any mixed project associated with influence and income. The project subsequently limited its intervention to promotion and on-site training to women's groups (Fernando 1996). Box 6, on the Feeder Roads Programme in Mozambique, suggests that a series of measures are needed to promote female participation in road construction, starting with the recruitment process.

**Box 6: Increasing women's participation in road building in Mozambique**

The Feeder Roads Programme (FRP) in Mozambique set a target for the participation of women in road construction and maintenance of 25 percent but consistently failed to achieve this. A review was commissioned to examine barriers to female participation and suggest measures to counter these. Among the barriers identified were:

- recruitment processes controlled by men
- lack of women in supervisory positions
- information about employment opportunities not channelled through media accessible to women
- work involved staying on camps with few facilities, no health care, far from markets to buy or sell food

Measures suggested to improve female participation included:

- improved outreach and consultation with women's groups in recruitment process
- hiring more women in supervisory positions
- provision of health and childcare facilities near worksites

As a result of the study, a gender advisor has been recruited to the Roads and Bridges Directorate of the Ministry of Public Works, who will have responsibility for monitoring the study's recommendations as well as for examining ways in which the Directorate can institutionalise its capacity to support gender-sensitive programmes.

*Source:* Baden 1997, citing Forum Mulher 1996

## **6 New directions for research and policy development**

- Greater attention is needed to the social and organisational aspects of infrastructure provision, particularly to intrahousehold processes and decision-making which lead to gender divisions in use and control of infrastructure facilities and services.
- More recognition is needed of the diverse organisational forms, often highly informal, involved in infrastructure services provision and management in poor communities, and the ways in which gender, and other social divisions (e.g. caste, class), are represented in these.
- Gender analysis could be brought to bear on those subsectors which have thus far received little attention in infrastructure development, e.g. telecommunications, with particular attention to questions of access, activity patterns and time use and potential income-generating effects in low income households.
- Comparative study of gendered cultural norms relating to infrastructure/technology use might shed light on ways to counter the negative effects of these on women's access.
- A review of explicit and implicit criteria applied in prioritising and evaluating infrastructure development interventions, would assist in identifying areas of gender bias and/or where additional/alternative criteria or systems could be introduced.
- Mechanisms for ensuring the accountability of private sector operators to low income (and particularly women) users of infrastructure need to be explored.

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