Women Friendly Infrastructure Development: Progress and Challenges in Public Infrastructure Development in India[1]

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I. Introduction

A country's infrastructure provides the basic framework for its growth strategy. Giving impetus to infrastructure development is thus a priority for most nations across the globe, but particularly in developing countries. It is not surprising, thus, that infrastructure investments account for as much as 50 to 70 percent of national public investment in most developing countries (Gutierrez, 2009). In addition, a large share of private and community investments goes into developing infrastructure, such as housing, schools, hospitals, commercial buildings and market places, power plants, roads and highways, airports, telecommunications, etc. Physical infrastructure, in particular, is an integral part of development of an economy. It provides the basic services that people need in their everyday life such as water, sanitation, education and health and supports enhanced employment and production opportunities required for economic growth.

India has also seen large scale investments in infrastructure since independence, but more so in the Eleventh Plan period when infrastructure development was recognized as the key priority areas. The total investment in infrastructure during the eleventh plan was around Rs.24,24,277 crore, (of which Rs.15,36,773 crores (63 percent) was public investment. Infrastructure investment is estimated to have increased from 5.7 per cent of Gross Domestic product (GDP) in the base year of the eleventh plan to around 8.4 per cent in 2010-11.[2] This is expected to keep around 7 to 9 percent in the twelfth five year plan period, with an estimated investment of Rs.55,74,663 crores[3] of which Rs.28,90,823 crores would be from the public sector (both Center and State investments).

Considering the huge investments in the sector it is thus important to understand the gender implications of infrastructure development in the country and its potential impact on women and girls and the conditions which have and can enable positive gender impacts.

II. Rationale for Gender Considerations in Infrastructure

The first point generally raised in this line, even today, is that infrastructure is gender neutral and that men and women will equally benefit from any new or developed infrastructure. Why is then gender even a question for infrastructure projects and how can one possibly measure the impact of such projects on women and girls. This often posed question has been answered many times by various feminist economists since 1990's. Doran (1990) has argued that the gendered division of

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[2] Twelfth Five Year Plan Document, Planning Commission, Government of India

[3] Around One Trillion USD

labour and existing inequalities in intra-household relations, property rights and cultural restrictions leads to differentiated use, access and control over infrastructure facilities and services by men and women. Baden and Masika (1997) further add these differences lead to men and women having very different needs and priorities in terms of infrastructure and thus 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. The heaviest burden of poor infrastructure falls on the shoulders of women and girls, who haul the water and fuel, and risk sexual attacks from lack of sanitation facilities, illness due to smoky cook stoves, and travelling long distances by foot with heavy loads. (World Bank, 2010). Inadequate infrastructure has been recognized as one of the major contributing factors for over-burdening or "Time Poverty" of women (Lawson, 2008) Further, infrastructure is also explicitly linked to poverty (Gutierrez, 2009) and lack of access to infrastructure or having limited use of the infrastructure due to its masculine designing is also one of the major road blocks in women's employment and economic growth (UN Women 2012).

The answer has been well summed up as "*Infrastructure development is not simply a technocratic question. It requires combining supply-side issues of technical design specifications for provision of infrastructure services with demand-side dimensions of who uses infrastructure, for what purposes, how it is paid for, and with what impacts on individuals, households, and communities. In this respect, infrastructure development is not gender-neutral*." (World Bank, 2010).

Gender is thus a very important area of infrastructure planning and provision. Table 1 summarizes the arguments put forth in these studies over the years. As can be seen therein, the rationale for this emanates from equity, economic, efficiency, welfare and empowerment perspectives.

Perspective	Rationale
Equity	When women contribute equally to economic activities it is also important that they should not have to share an unequal burden of responsibilities particularly due to lack of infrastructure facilities like transport. (Mott MacDonald, IFC, 2012). It is essential to view women and girls as the "primary clients whose satisfaction is a critical factor in ensuring the project's success and sustainability (OECD,n.d.). Gender equality means that women have equal access to resources and rights as men, and vice versa. (UNDP,2010)
Efficiency	The payoffs for gender mainstreaming actions would be very high. There is accumulating evidence that by supporting gender equality and women's empowerment in infrastructure operations, not only increases women's opportunities but also enhances project effectiveness, efficiency, and sustainability. (World Bank, 2010)
Economic	Infrastructure facilitates the basic functions of a society that are necessary to transport resources and people, produce and trade goods, provide essential services and ultimately reduce poverty. (Global Poverty Project ; World Bank, 2010) Further, 'time poverty' limits women's ability to develop or access complementary sources of income. Infrastructure provision such as better transportation and water services can be very effective, and important, in the context of reducing time poverty. (Parikh and Sharma n.d.; Lawson, 2008).Where road connectivity is high, women's participation in the workforce is high (Dewan 2012)
Welfare	Simple infrastructure measures, such as provision of regular water supply, fuel –wood availability and providing schools with water and safe toilets, can enable girls school attendance, and reduce health-related risks for all (UNICEF, 1998, 2008; UN WATER, 2006) Designing public spaces particularly in cities with a gender perspective can play a major role in curtailing violence against women. (Whitzman, 2013; Vishwanathan, et. al, n.d.)
Empowerment	Project experiences of various NGOs, shows that where gender has been included in infrastructure projects particularly through women's groups/networks they have helped largely in empowerment of women and increasing their say on governance issues. (Field experience of Non Governmental Organisations (NGOs) in India like Society for the Promotion of Area Resource Centers (SPARC), Mahila Housing Trust (MHT), Centre for Urban and Regional Experience (CURE), etc. working on women-led

infrastructure development)

III. Review of Gender Mainstreaming in Infrastructure projects

Given the clear rationale for inclusion of gender consideration in infrastructure projects, it is thus important to see how far government's infrastructure policies and programmes in India have been able to include the same. We have thus tried to see the major infrastructure policies, programmes and schemes in the last decade, to assess the status of gender mainstreaming in infrastructure. To better understand the trends, we have divided the infrastructure services into three broad categories:

a) Basic Infrastructure Services which includes Health, Education, Water, Sanitation and Housing

b) Growth-Linked Infrastructure Services which includes Energy, Transport, Industrial Development, Market, Tele-Communications and Tourism

c) Women Specific Infrastructure which includes Hostels for students and working women, Crèches and Day-care centres, Crisis centres, Shelter Homes and Women Friendly Police Stations

Effort has been made to broadly understand the implications of these sectors for women in India; the policy frameworks and the inclusion of gender objectives and wherever applicable the budgetary allocations for gender inclusion activities.

A. Basic Infrastructure Services

As discussed earlier, women bear the disproportionate burden of lack of basic infrastructure services particularly availability of water and sanitation, inadequate housing, and lack of access to health and education.

Water Supply:

Given the division of labour in our society, domestic responsibilities like fetching of water, fall within the domain of women and girls. Lack of water facilities thus leads to women and girls spending hours fetching water walking long distances and carrying head loads of water. Often this also leads to loss of wages for the women who work as daily labourers or the girl child missing school for fetching water. The situation worsens in summer months and during drought years. Recognizing this fact, and with the MDGs focus on the issue, the Government of India has also taken the following steps in this direction.

The National Rural Drinking Water Programme (NRDWP) was geared with a focus on covering 798967 habitations by the end of the XI Plan period. By end March 2012, the coverage was up to 6,65,034 (83 per cent of the target), through an anticipated expenditure of Rs 39,211 crores as Central Outlay for the scheme. and expected State expenditures of `49,000 crore. This is a 281 percent increase over the tenth plan investments which in itself had seen a 163 percent rise from the Ninth Plan.[4] One can thus see that the last decade did see a high investment focus on water supply. This focus is expected to benefit women primarily as they face the maximum brunt of not having water facilities. In addition to this, within the programme, gender empowering components were included focus on participation of women in scheme planning as well as by provisioning for reservation in the water committees at the village level.

For urban water supply, Rs. 29463 crores was allocated for water supply under Jawaharlal Nehru National Urban Renewal Mission (JNNURM). While this has led to increased access to water services, however, India is still one of the poor performing countries in terms of water supply in cities. (Twelfth Five Year Plan Document). Further-more in urban areas access to the poor and vulnerable categories like slum dwellers is also an issue. Unfortunately the Basic Services for Urban Poor (BSUP) component under JNNURM which is crucial for slum women not only covers slum population inadequately (from 3 to 16%), but the implementation rate is also low varying between 20 to 40% (Patel,2013). In addition there are many issues still to be addressed in terms of regular and reliable supply and quality of water both in urban and rural areas. (Twelfth Five Year Plan Document).

Nevertheless, it needs to be acknowledged that provision of infrastructure for water has been one of the most successful women friendly initiatives in the last decade. The results from census 2011 wherein 46.6 percent of families in India have been reported to have access to water within premises and 35.8 within 100 meters of their homes as against 39 percent and 44.3 percent respectively in 2001 is a clear indicator of this. Percentage of households having tap water as source has also increased from 36.7 percent to 43.5 percent.

Sanitation Infrastructure:

A closely related issue is that of provision of sanitation facilities to everyone. Here again the gender biases exist; while toilets are the need of every one and impacts the public health in general, women and girls are more impacted by lack of toilets due to issues of privacy, dignity and most importantly security. There is a growing opinion that lack of access to sanitation could be one of the important factors in increasing the vulnerability of women to sexual assault. (UN Water, 2014; Dasra, 2012; Lennon, 2011). However, an overemphasis on this in policy circles is misplaced..

The Government's major programme to address this issue was the Total Sanitation Campaign (TSC). Under the TSC, in the eleventh plan period, 562 million households have been supported with individual household toilets, in addition to construction of school toilets, anganwadi toilets and sanitary complexes. The total expenditure under TSC has been around 6469 crores in the

[4] Twelfth Five Year Plan Document

Eleventh plan.[5] Unfortunately, even with all these efforts, the TSC has only been able to accelerate sanitation coverage from 22 per cent as per the 2001 Census to 31 per cent in 2011, with over 600 million people still practicing open defecation.

The situation is grim even in urban areas. Further, even a partial sewerage network is absent in 4861 cities and towns in India.[6] This is in spite of the fact that the government under JNNURM made a total investment of '27091 crores for sewerage and drainage connections through 341 projects. With no subsidy for toilet construction and lack of sewerage lines which increase construction costs manifold in cities and towns, it is not surprising that as per 2011 census, about 13 per cent of urban households did not have access to any form of latrine facility and defecate in the open. Census 2011 also revealed that about 37 per cent of urban households are connected with open drainage and another 18 per cent are not connected at all. This situation impacts woman much more as shrinking open spaces in urban areas and congested habitations make it really difficult for women to even find space for open defecation. (One can often hear cases of slums where women use plastic bags or are forced to go very early or late in the night for defecation as there are no other options).

There have been many recognized reasons for this like lack of adequate investments particularly unit costs; lack of community awareness and accountability and transparency in the sector. However, one of the most crucial reasons has also been the lack of priority within the family and community (particularly PRIs and other local bodies) due to the gendered nature of the problem and the non-involvement of women in the scheme management and implementation. (Box 1)

Box 1: Involving Women in Planning and Management

In eight slums in the Tiruchirapalli district of Tamil Nadu State, India, latrines constructed by the municipal corporation had all become unserviceable due to poor maintenance. The women reported that the poor maintenance of the latrines caused faecal worms to generate and reproduce, and they could be found near the water taps, and even inside the walls of their houses. Poor sanitation and contaminated water affected all families and increased their medical expenses. Male community leaders did not take any steps to provide improved facilities. Finally, the people joined forces with Gramalaya, an NGO working on water and sanitation projects. The project design called for the installation of drinking water facilities and individual toilets, as well as community mobilization, with a focus on gender mainstreaming. WaterAid covered the equipment and installation costs, while Gramalaya covered the capacity building and community mobilization components. The government provided the land sites, electricity, water supply, and loans to community members. The community benefits from improved water and sanitation facilities, better

[5] Twelfth Five Year Plan Document
[6] Twelfth Five Year Plan Document

health and increased resources for community development, and the women have gained self-confidence.[7]

Experience of other NGOs also very clearly shows that where women are involved in implementing sanitation projects the results are very effective even in urban areas (Khosala, 2009) Furthermore, while in rural sanitation projects there is a growing awareness for inclusion of women in management and programme implementations the same is seen lacking in urban policies particularly the National Urban Sanitation Policy and most City Sanitation Plans.

Another major issue is regarding the availability of safe and clean public toilets for women. Studies (Vishwanathan, n.d.) have shown that most public spaces including many government buildings, schools, bus stops, market spaces, etc lack clean public toilets. Most toilets are dark and dirty, with broken doors, no water and no attendants. Further they are poorly lit posing a threat to safety. It is no wonder that these are seldom used by women. Even when available the physical infrastructure often lacks certain very basic (and often less expensive) but very useful elements like hooks, slabs, dustbins, handles, etc. which could make the facility more women-friendly.

Overall the fact remains that in spite of the need and growing demand for sanitation, the government has failed to deliver this commitment to the women of the country.

Housing:

The Right to Shelter has been recognized as one of the basic human rights and it is well known that being deprived of adequate shelter makes a woman much more vulnerable both in urban and rural areas. To provide housing infrastructure, the government of India has two major programme the Indira Awas Yojana (IAY) which is a rural housing scheme and the housing components under JNNURM[8]. Interestingly the analysis of the policies in terms of housing and gender shows that while in rural areas much was being done, urban housing has been one of the neglected sectors. Thus while the XI plan saw 53022 crores being allocated to IAY, only Rs. 13000 crores was allocated under JNNURM[9]. Around 140 lakhs dwelling units were sanctioned in the eleventh five year plan period under IAY. In contrast during the seven years of implementation of the BSUP and the IHSDP (Integrated Housing and Sanitation Development Programme) component of JNNURM, only about 160 lakh dwelling units have been sanctioned. There thus does remain a very high shortage in urban housing for the low income segments. The Technical Group on the Estimation of Housing Shortage (2012-17) projects the total shortage of dwelling units in urban areas in 2012 to be 1878 lakh units. This impacts slum women in a very big way, who are not only forced to live in

[7] Source: I. V. Berna, 2006. India: From Alienation to an Empowered Community - Applying a Gender Mainstreaming Approach to a Sanitation Project. Quoted from UN Water, 2006.

8 This includes, BSUP, IHSDP and Rajiv Awas Yojana (RAY) which is a slum development programme

[9] Under the BSUP and IHSDP components of JNNURM, the cumulative expenditure across seven years has been approximately `13,000 crore. Despite its superior architecture, RAY has not evoked immediate response from the ULBs or the State Governments (Twelfth Five year plan document)

inhabitable conditions but also subjected to increase violence both in public and private sphere due to the same.

Further, in terms of addressing gender concerns, the IAY has brought out a clear mandate of provision of homes either in the name of women or jointly. The design of the homes has also been made a bit more women friendly by inclusion of mandatory construction of toilets and smokeless chulhas. One may thus say that the gender concerns are being addressed to some extent in rural housing programmes.

Unfortunately, in urban areas while the Rajiv Awas Yojana (RAY) does mention the need for women's participation in consultations, procurements and community based organisations as part of its community participation guidelines, it is not explicitly spelt out targeting of women as beneficiaries as its goal in the main guidelines, where it is concerned more with slum-free city planning. Thus there are no mandatory women consultation/consent clauses or the need of gender assessments of Detailed Project Reports (DPRs) under RAY. There are thus many observed gaps in the projects being proposed/implemented. Often the resettlement projects lead to loss of livelihood for the women particularly those who work as maids or vendors. There is no adequate transport facility attached to the resettled localities. Even after the new housing society is handed over to the dwellers, there is no mandatory provision for inclusion of women in the resident welfare committees. Field experiences show that unless this is made mandatory, women would not have a say in the management of the new homes while being left to bear the brunt of poor maintenance of the societies. (Although residential management essentially is about managing water, cleanliness, electricity and security services- most of which impact women more than men)

Health and Education Infrastructure:

The other basic infrastructure requirements for women not emerging from their practical needs but due to their social status (being allocated less priority within the family) and restrictions to their mobility are health and education infrastructure. It is important to note that while many other considerations factor in when one wants to measure the access of women and girls to health and education services- the first and foremost is the location of the services within reasonable distance.

Unfortunately in India both these services are based solely on population norms, which although essential should not miss-out on the mobility restrictions of women/girls. Nevertheless, one would need to say that over the last decade and particularly the eleventh five year plan period has seen huge investments in health and education infrastructure which has helped the access to women and girls to these services.

During the Eleventh Plan funding for health and school education by the union Government has been around 83407 crores and 95307 crores respectively.[10] Much of this investment has been used for physical infrastructure generation as is revealed by the physical target data monitored by the Ministries and the twelfth five year plan document.

[10] Including 77586 crores from SSA and 17,723 crore from RSMA

The result has been an increase in number of public health facilities over the 2007–11 period—Sub-Centres by 2 per cent, Primary Health Centres (PHCs) by 6 per cent, Community Health Centres (CHC) by 16 per cent and District Hospitals by 45 per cent. Yet shortfalls remain, 20 per cent for Sub-Centres, 24 per cent for PHCs and 37 per cent for CHCs, particularly in Bihar, Jharkhand, Madhya Pradesh and Uttar Pradesh. Though most CHCs and 34 per cent PHCs have been upgraded and operationalised as 24 × 7 facilities and First Referral Units (FRU) have doubled, yet the commitment of Eleventh Plan to make all public facilities meet Indian Public Health Standards (IPHS) norms, and to provide Emergency Obstetric Care at all CHCs have not been achieved. It is not possible here (within the limited scope of this note) to attribute the benefits of these infrastructure to women and to measure the burden which women face due to lack of these infrastructure. However studies have shown that investments in health infrastructure have a major role to play in improving women's health particularly by increasing institutional deliveries and ensuring early detection and treatment for majority of diseases as women are known to defer seeking medical advice when it is not within reach.

Also more important here is to note that while the health infrastructure is being created, it may or may not be gender friendly. There has been a growing awareness on these lines, which has led to many of the PHC/CHC now having curtained examination rooms, separate toilets for women, etc. However other services like safe abortion is not available in all CHCs, a gap which could be contributing to maternal mortality. Further-more CT Scan/MRI machines are not available at times even at district hospital level, which can be a major contributor to women's mortality due to cancer especially with the increasing incidence of breast, ovarian and uterus cancer. Even though the deficiency of calcium in women in India is known, bone density testing facilities, are hardly available at CHC or sometimes even district hospital level which could go a big way to ensure early detection and treatment of osteoporosis and arthritis- two diseases which are common among women in India.

Similar trends are observed in case of school infrastructure. India Infrastructure Report (IDFC, 2012) points out that most of the Sarva Siksha Abhiya (SSA) investment has been on developing school infrastructure. A fact also revealed when one sees the cumulative progress in SSA in terms of sanctions which shows that 30 lakhs sanctions have been for construction activities as against 19.65 lakhs for teachers. Inspite of this investment, many schools lack the basic infrastructure facilities required under the Right To Education Act. For example, the retention of girls in school remains difficult given that over 63 per cent of rural schools have no usable toilet facilities for them.[11] Further-more playgrounds which are very important for the overall growth of girls is still either controlled by boys or are not adequate. Under Rashtriya Madhyamik Siksha Abhiyan (RMSA) again where the target is to convert primary schools into upper primary and thereon is the objective, there are some field reports that instead of new infrastructure creation existing schools are being merged to meet the population guidelines. (http://teacher-info.blogspot.in/2014/09/norms-for-rationalisation-of-schools.html) This could mean that the girls who had access to basic schooling within the villages may also have to face problems in reaching

[11] Twelfth Five Year Plan Document

out to school, a point which might actually in future lead to reduced enrolment and increased drop out.

Even in higher education and technical training, while emphasis is being given on reaching out to girls the number of women it is (Industrial Training Institutes) and Polytechnic colleges constructed remain very low (often running in shabby rented places),[12]which restricts girls access to skilled training and jobs. Even where basic infrastructure exists and women are present, the awareness of creating facilities geared up to their needs is absent..

B. Growth-Linked Infrastructure

As can be seen above, there are many gaps in the basic infrastructure sector in terms of increasing women's access as well as their stake in the projects. However, one would admit that compared to the past there have been many visible improvements in terms of gender mainstreaming given the pressures from the women's movement, international women fora, scholars and activists.. Not only have issues of water, sanitation, health, education and housing been brought to the fore-front but there have also been capital investments, which would shows results in the long run. Even more important is the changing approach for implementation of these projects which are now seeing looking up to community participation and emphasizing on the participation of women in the same.

Nevertheless the fact is that all these sectors are viewed as social sectors which have anyway been undergoing change in approaches and adoption of new outlook in terms of policy of entitlements, participatory programming, community monitoring, etc. It is important, however, to see how the hard-core infrastructure sectors- so called determinants of growth- are faring in terms of gender mainstreaming.

Interestingly, unlike the social sectors, these growth linked infrastructure sectors like energy, transport and communication are still not sensitive to the issues of women and the need to incorporate their needs and concerns in the projects. A review of the policies and programmes in these sectors shows that not only is there a lack of sensitivity to these issues but also gaps in understanding and in effect acknowledging that women have a role to play in these sectors. Even the twelfth plan document which talks of inclusive growth has failed to adequately capture the gender dimensions within these sectors (the analysis and recommendations only come from the women's chapter). An effort has been made here to see what are the gender dimensions within these sectors, where is the role of women acknowledged and where are there any specific initiatives which are being taken to address the needs of women.

[12] While official data on exact number of ITIs and Polytechnic colleges is not available, http://shodhganga.inflibnet.ac.in/ states that there are 5114 ITIs and 1296 Polytechnics in the country of which 86 polytechnics are exclusively for women. As per http://www.peoplefactorindia.com/frameworks/women-in-itis-2/= there are 313 Government ITIs for women, 136 private ITIs for women and 726 women wings in general Govt. ITIs and 118 women wings in general Pvt. ITIs. In addition to this, about 30% seats are reserved for women in general ITIs. However MHRD report states that 71 percent and 65 percent of the students in diploma and PG diploma course are males, which further highlights the shortage of seats. There are also issues regarding courses offered to women, but that is outside the purview of this document. The Eleventh Plan did see sanction of 482 women's hostels as against a plan of 500 but the results are yet to be seen.

Energy:

Energy is very important for social and economic development and hence a lot of investment goes into energy production, distribution, and management. However, it is also important to analyse energy usage patterns particularly from a gender perspective. Table 2 shows the different uses of energy and the main existing source for women. It is clearly seen that the intensity of requirement of energy for a particular use differs by gender. Limited access to energy particularly for cooking and home lighting would thus have more effect on women than men. The table also reveals that even though the intensity may vary, women are basically users of all types of energy and hence need to be considered as beneficiaries in all energy policies and programmes. Energy is also essential in expanding economic and social opportunities for women and lack of energy services directly impacts the productive capacities of women. Also, apart from costs there are other barriers which constrain women from moving to cleaner sources of energy. Unfortunately inspite of this reality the energy sector has been slow to acknowledge the links between gender equality, energy and development.

Table 2: Gender Differences in Energy Use and Access

Energy Use	Intensity of Use for Men	Intensity of Use for women	Energy Source	Ease of Access For Women
Cooking	Low	High	Fuel Wood	Declining availability; Time Spent in Collecting; Not available in urban areas; Negative health impacts
			Coal	To be bought at increasing prices; negative health impacts
			Kerosene	Not available adequately at subsidies prices
			Bio-gas	High one-time costs, requires maintenance, not technically suitable for all areas
			LPG	Not available easily in rural areas; High Prices (declining subsidies) reduces access of poor women
Home Lighting	Medium	High	Kerosene	Not available adequately at subsidies prices
			Electricity	High Costs for the poor; Not easily available in interior areas and for slum dwellers
			Solar	High investment
Water Pumping	High	Medium	Electricity	High Costs
			Diesel	Increasing Costs
Direct Production	High	Medium but demand is high	Electricity	High Costs, Irregular Supply (high power cuts)
Marketing/ Vending	Medium	Medium	Kerosene	Not Easily Available
			Solar	Lack of awareness
			Electricity	High Costs

It is thus important to first review the access of energy for people in India. Census 2011 shows that 67.4 percent households do not have access to modern cooking fuels and 32.7 percent households do not have access to electricity, in India, a fact which is likely to affect women even more. What is even more disheartening is the fact that energy policies and programmes tend to generally overlook these gender considerations while focusing more on infrastructure development covering energy production, transmission, storage and distribution, including electricity, oil and gas, renewables, hydro and tidal power, and energy recovery from non-recyclable waste as well as

power plants, electricity grids, solar panels, and wind turbines. Kelkar (2008) has also criticized this supply oriented planning, stressing on the need for demand focus.

Firstly, there is a very high emphasis on energy for productive purposes which although needed by women its intensity is lower than their needs for consumption energy. The result is that the energy generation focus has shifted to those sources like electricity, solar, etc. which can meet the productive needs. While this is good in terms of clean energy solutions, this has been done without ensuring a smooth transfer of all the consumption needs to cleaner sources of energy. Thus women continue to struggle for their cooking energy needs, expending large amounts of time and physical effort to supply fuel for their households and productive needs, using their own labour to carry heavy loads over increasingly long distances, at great risk to their health and safety.[13] Other health hazards arise from the fact that women do most of the cooking.[14] The latest NSSO data for 2011-12 reveal that even now 42 percent of rural women engaged primarily in household duties collect vfuewl and firewood while almost 44 percent prepare cow dung cakes for meeting fuel needs (NSSO 68th Round).While there are schemes for promoting alternative sources like bio gas plants and LPG subsidies, the required infrastructure support for these is not available. Thus while bio-gas plants are being promoted, the subsidy provided is inadequate to cover the costs and due to lack of proper community awareness, the project does not often find many takers. Often the ones completed are contractor based works which end up being dysfunctional due to lack of maintenance. Experience of NGOs like Aga Khan Rural Support Programme India (AKRSPI) and Gram Vikas have clearly shown that when women are trained in usage, repair and maintenance of the bio gas plants then the infrastructure created is regularly maintained and utilized.

For LPG also, on the one hand the declining subsidies are increasing the cylinder costs which make it beyond the reach of the poor women. On the other, even when they are ready to pay for the same, it is often not available easily to them. For slum women it is often due to lack of proper documentary proofs required and for rural women it is due to the non-availability of distribution centres within a specific radius as also lack of delivery service facilities being made available. The LPG rural distribution network is yet to be in place and this would require huge public investments in infrastructure rather than the current policy focus on providing LPG dealership to private individuals and expecting them to service rural areas too as under the current Rajiv Gandhi Gramin LPG Vitrak (RGGLVs) Scheme. (launched in 2009). Although one must mention the commendable gender initiative of this scheme here wherein all retailers are in the joint names of the applicant and his/her spouse (i.e wife/husband will be co-owner of RGGLVs).[15]

Secondly, there are huge gaps in distribution infrastructure which result in lack of access. The fact is that under the RGVVY (Rajiv Gandhi Vidyut Vikas Yojana now renamed as DeenDayal Gram Jyoti Yojana)scheme (for rural electrification) there are still 8299 villages which have to be electrified

[13] Parikh and Sharma (n.d.). Her study in Himachal Pradesh, shows that, women spend on average, each month, 40 hours collecting fuelwood. This breaks down to 15 round trips, each of 2.7 hours, and a monthly distance walked of some 30 km.

[14] Indoor air pollution, caused in large part by traditional cooking practices, kills nearly 2 million women and children each year. (USAID).

[15] http://pib.nic.in/newsite/erelease.aspx?relid=53240

and another 6000 which need to be energized. Further, the coverage of all habitations within the villages is still not monitored. Added to this is the fact that free connections are given only to BPL households (the status of which is much debated) and many poor families are left to fend for themselves. Even the progress of release of APL connections is slow on account of poor supply of electricity, long delays in processing of applications and inadequate transformer capacity. Also in certain States, even the minimum required hours of supply of six hours to eight hours have not been met. The result is that the most poor families still use multiple sources for home-lighting or use electricity only at night. In the absence of a transition plan, these families are bound to suffer and women will suffer more as the alternative source would generally come as kerosene which would have to be set-off from their cooking needs. This situation also applies to urban areas particularly slums, which not only find it difficult to get access to legal electricity and pay high electricity bills but in particular affect the productivity and income of women home-based workers.

There is an urgent need to generate a strong component within the energy distribution policies to enable complete electrification. It is also essential that women are involved as a major proponent of this programme, as they would not only be able to identify and work through the loop holes of the existing systems but also bring forth their concerns of high bills and payment procedures. Box 2 highlights the case of Ahmedabad wherein a women-led slum electrification project not only helped enable ease of energy access but also had promoted the use of energy efficient products among the community.

Box 2: WOMEN LED SLUM ELECTRIFICATION PROGRAMME

Many families in slums still find it difficult to get electricity legally in cities. This has meant that women spend their daylight hours on menial chores that could be eased greatly with dependable access to power. In an USAID funded project, the Ahmedabad Electric Company (AEC) and local organizations, like Mahila Housing Trust and SAATH; have helped plan a system to provide safe and reliable electrical service for 1.2 million people. The program was launched as a pilot in five informal settlements with the NGOs carring out awareness-raising outreach activities to educate the slums dwellers on the advantages of legal electricity connections and energy efficiency practices to help keep their bills low. The connection of the households to the grid commenced after these activities.

As the NGOs worked on a Community Based Organisation (CBO) approach which was led by women. The Women thus had a significant influence on program design and implementation and contributed innovative approaches to the success of the slum electrification initiative. This included a survey conducted by AEC to help determine the level of subsidies that would make the project affordable to the new customers. Another innovation was the issuance by AMC of mid-term (10 year) non-eviction certificates which granted the informal settlement households legal status and security of tenure. This ensured that the electrification exercise could be carried out within a legal framework. The final innovation was the introduction of an instalment mode of payment. Having the option of paying the subsidized connection fees and the subsequent monthly electricity bills over a set period of time made these costs more affordable to the beneficiaries.

Outcomes
A total of 850 informal settlement households had been electrified by the time the pilot phase of the program ended in 2004. After the program's initial success in providing high-quality, reliable service, the AEC has expanded the program to another 1.2 lakh households. Reliable service means that family members, including women, can work or study in the evenings and use sewing machines and other appliances to increase productivity and earning potential.

The third and the most important aspect of energy infrastructure projects, however is the negative impact on women arising out of land acquisition for large projects- be it thermal, hydro, solar, or wind energy. As is well documented women are generally at the receiving end in all of rehabilitation and resettlement projects due to the lack of gender considerations in the compensation packages as well as low involvement of women in the consultation/content obtaining procedures.

Transport

Transport infrastructure covers the movement of people and goods using all modes of transport from road, rail, air and marine travel to traveling by bicycle or foot, whether using private means or public transport. Also included within the transport sector are all types of travel networks which allow travel to take place and support the effective distribution of goods and services, such as roads, railways, waterways and footpaths, and associated user facilities such as bus and rail stations, ports, service and rest areas, depots and transshipment facilities, maintenance facilities and airports. The key issues from the gender perspective in the transport sector would thus be;

a) The movement or travel patterns of men vs that of women

   Studies (Dewan, 2012; Kusakabe, 2009) have much emphaised that the purpose of travel and travel pattern between women and men are different. Both women and men travel for leisure, work as well as migration. But women travel more than men for water and fuelwood collection, food gathering in the forest/ fields, for shopping as well as sending children to schools and taking them to hospitals. Also women travel for shorter distances more frequently, and combine trips (eg. shopping on the way back from picking up children from home).

b) The modes of travels preferred, used and accessible to men and women

   It is known that men are much more likely than women to travel as vehicle drivers, while women are more likely to travel on foot or as passengers. The intensity and frequency of usage of motorised transport by women is clearly less than that by men; this issue relates not only to accessibility but also affordability. Relatively few women access buses, rickshaws, and trains especially for longer distances, although frequency usage does increase along with rise in good road connectivity. (Dewan, 2012) Women are also slightly more likely than men to travel by public transport. (UN, ECE, 2008) While affordability generally tends to be a major issue for walking often it is the non-availability of public

transport suited to their needs which either hinders women's mobility or forces them to walk often with head loads. (Dewan, 2012)

c) How women friendly are the travel networks and associated user facilities

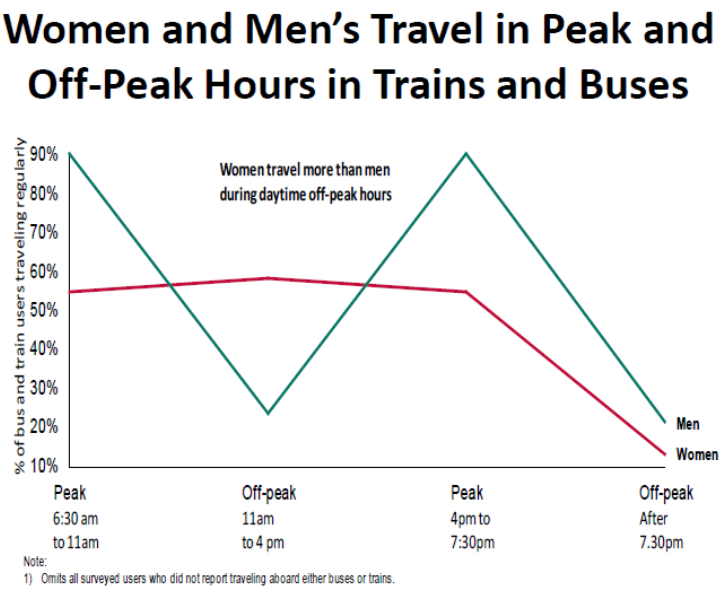
Women generally prefer such infrastructure that offers personal security, flexible mobility, hygiene and physical comfort, whereas men are only concerned about alternative travel routes for punctuality, safety while on the road, convenience and quicker connectivity to public utilities. (Kareem and Lwasa, 2014)

Most transport policies and projects, however, fail to consider these gender differentials in the project planning and designs. Generally speaking transport projects and programme planning are concerned with operational efficiency, institutional strengthening, increased traffic volumes, private sector participation, adequate services delivery, financial management, safety programmes, employment and income generating opportunities, training, and intersectoral linkages. This not only leads to delivery outcomes that are less aligned to variations in women's compared to men's end-user expectations but also hampers women's mobility in a big way becoming a barrier in their empowerment process.

The Twelfth Five Year Plan Document has acknowledged that transport access is critical for inclusive growth, economic development, access to markets and participation in the political process. It further states that "Every minute a woman dies in child birth, but many of these deaths could be avoided with timely access to transport…….. Gender responsive infrastructure interventions can free up women's time by lowering their transaction costs. This, in turn, will increase girls' school enrollment and facilitate women's participation in income generation and decision making activities."

Unfortunately when it comes to actual implementation, the focus remains issues like increasing investment for capacity, transport efficiency and creating of highways and infrastructure without undertaking gender considerations.

Public transport for example is still geared to focus on peak timings and prioritizing travel on economic routes- from peri-urban areas to city centres while it is known that women often travel during non-peak hours (see figure 1[16]) and their need to take short trips and often in non-centralised zones. For women it is very important also to have routes especially designated to markets, hospitals, schools and colleges, lack of which effects their mobility very inherently. Even when it comes to usage, often the accessibility of women in the buses, metros and trains is difficult. The number of reserved seats is far low to the proportion of women travelling. Even amongst women, the nature of constraints faced with regard to intra-urban mobility and personal security differ not only on account of poverty status and type of settlement in the city, but also according to age, household characteristics, degree of engagement in income-generating activities (Chant, 2013). Poor women often face heightened challenges related to their difficulty accessing essential services. For many of them, especially single women, women vendors, and domestic workers, the need to regularly access public spaces and public transport creates heightened vulnerability.



Safety measures are not ensured. Women and girls experience multiple and various forms of violence and harassment. Privatization of public transport is even further worsened the situation. It is not surprising thus that India was ranked as the fourth most dangerous place for a woman to take public transport in a poll published in October 2013 by the Thomson Reuters Foundation.

The overall design of the service is also often not very women friendly. Design improvements are necessary to meet the specific needs of women, especially lower height of entry steps, length of straps, and so on in buses and trains, installation of handrails, ramps, and so on.[17] In this era when so much emphasis is being laid on comfort technology, none of our trains or buses are designed to meet the needs for a women with child or those who thrive on vending and carry head loads. Many a times women have to walk long distances with head loads because they are not allowed to board a bus due to their head load.

[16] Source: Ganguli, et al, nd, , A Gender Assessment of Mumbai's Public Transport; A study by Dalberg for World Bank

[17] Twelfth Five Year Plan Document

Vehicles construction and safety may have different ramifications for women's and men's safety and health. Frontal airbags reduce driver deaths by 12 per cent for women but only 6 per cent for men. Head protection side airbags reduce the risk of fatality among female and male drivers by 33 per cent versus 44 per cent. Torso-only airbags reduce the risk of fatality by 21 per cent for men but do not significantly reduce women's risk. (UN, ECE, 2008)

Further while there is so much focus on rural connectivity and road roads, women-specific needs are transportation of especially primary products as head-load, local markets, inter-and intra-village roads and paths, non-motorised transport (NMT), walking, pedestrian and sidewalk use, and security largely go unheeded. (Dewan, 2012). The prevailing reality of women being primarily head-load carriers implies that the main reach of their participation in marketing activities is centered in the local neighbourhood. The absence of all-weather road connectivity severely impacts the sale of primary produce, especially that which is perishable, and additionally restricts even peddling of non-agricultural commodities. (Dewan, 2012)

Even in urban areas, development of streets and pedestrian walkways is not something focused on. Additionally, the lack of street lighting in commercial areas makes it difficult for women to work late. Walking on dark roads and unlit streets is something most women avoid. Added to this is the need for safe, secure and clean associated services like bus and railway stations. Lack of clean and well lit public toilets at the stations and on highways, insecure waiting rooms, etc are major hindrances to women using transport facilities especially at night.

At the policy level, the huge investments being stepped up for Highway infrastructure may be in the interest of transporting goods faster, However, without a gender assessment they can have potentially very negative impacts on women. Lateef (2005) has well documented some of the negative impacts of highway projects on women.[18] She has particularly highlighted the impact on health (spread of HIV/AIDS), safety (accidents, trafficking), etc for women and children. Often a highway link can divide villages, with grazing lands on one side and herds clan settlements on the other. This often results in difficulties in crossing over even death of cattle leading to women loosing livelihoods. There are also reports of increased accidents, which could result in increasing young widows. The fear also makes women reluctant to send their children to Anaganwadi and Primary School when the crossing of highway required. Also the huge influx of migrant labour increases the risk of being prone to HIV and even trafficking/prostitution due to exploitation of the local socio-economic situation and culture by outside influence. Further when roads open forested areas, deforestation affects the livelihoods of women. There is more intensive land use with increased use of fertilizers and pesticides increases health risks to women and men. These negative impacts often increase without the necessary awareness measures and community empowerment. Expressways may also divide a community impacting on kin and social networks and areas to services and economic activities. Further large scale land acquisition for such projects and generic resettlement also has

[18] It is important to note here that there negative impacts are not being highlighted to counter the infrastructure development projects in these areas but to highlight the need to undertake a gender analysis to understand the probability of these impacts in the project area and to plan accordingly. Also see example in next section on gender analysis led gender planning for Indian Highway Corridor supported by ADB.

disproportionately negative effects on women as there are least likely to benefit from compensation.

In spite of these documented analyses, unfortunately, gender assessments/audits of transport projects are still not a mandate in India. Further, while the transport sector tends to employ a large number of people, the participation of women in the same is limited[19]. It is important to go into the details of the same.

While cultural issues are important, there is also a growing opinion that the way transport is designed, built, and operated results in transport systems, facilities and operations that is not comfortable for women to use. It is essential to know about ergonomic issues related to women's use of vehicles as a function of their work, especially as truck and bus drivers. There is also the issue that even where competence exists and women show some willingness, the HR systems of the transport sector are not geared up to encourage women, firstly due to their mindsets and stereotyping regarding transport roles and women and secondly as it would mean an additional support system to ensure their safety. This, however, results in less and less women being employed in the transport sector, which in turn creates a system wherein women as users of public transport do not get a safe and sensitive service. While some Southern States like Kerala and Andhra Pradesh have taken steps to recruit women in the public transport sector, this has not gained much support in the other states. This may be mainly due to societal restrictions, but one also needs to understand the specific efforts undertaken in these States to increase women's employability in the transport sector like specific training, facilities like rest rooms, etc. Overall at country level, training to women as well as provision of support activities in the transport sector has received very less impetus thereby limiting their access to employment. Labour based routine road construction road maintenance are of course a useful means of enhancing some poor women's income by providing increased employment opportunities. However, as most work here is done in the unorganised sector, women are often deprived of their genuine wages and other rights as workers.

C. Women Specific Infrastructure

While viewing general infrastructure projects with a gender perspective is very important, it is also important to consider that there are some specific infrastructure requirements which are women specific or more required by women than by men. Two of the mains types of such infrastructure which women require are hostels or shelter homes (i.e. safe residential complexes beyond their homes) and Crisis Centres for Victims of Violence. It is very important for infrastructure policies and programmes to focus on such projects. However, even more important than having such designed infrastructure projects is to allot adequate budgets for the construction of such physical infrastructure and to ensure its full utilization on the ground as well as to support the repair and maintenance costs of such infrastructure.

[19] NSSO 68th Round 2011-12 shows that for every 42 men employed in rural India in transport sector only 2 women were employed and for evry 117 men employed in urban India only 27 women were employed. Further more as per DGET figures, in 2011, women constituted only 9% of the organized sector workforce in transport related activities.

Construction and maintenance of hostels for girls and working women is among the most specific and important infrastructure requirement of women. Having adequate number of such hostels can go a long way in endowing women with an opportunity to avail of better education facilities and also increase their mobility to seek better employment opportunities especially in urban areas.

Currently, construction of such hostels is the responsibility of the government and is being done through multiple schemes. Thus there are schemes like Kasturba Gandhi Balika Vidhyalayas and Girls Hostel under RSMA implemented by the School Education Department and schemes like Babu Jagjivan Ram Chhatravas Yojana (BJRCY); Hostels for ST girls; etc being run by Department of Social Justice and Empowerment. In some urban centres there are private institutions also running hostels. As the total number of hostels running for girls in the country is not known, it is not possible to assess the adequacy of the same. However, based on available data the major gaps which come to light in terms of infrastructure development are:

a) **Lower target achievements in the schemes-** As against a target of 3,479 hostels for secondary and senior secondary schools, between 2008–09 to 2011-12, only 958 were constructed, an achievement of only 26%.
b) **Inadequacy of allocations for girls hostels as against boys hostels**- Under BJRCY, 98 girls' hostels were constructed covering 6,379 beneficiaries and 125 boys' hostels were constructed covering 9,603 beneficiaries during the period, 2008–09 to 2010–11. The ratio of girls to boys hostel being 1:1.3 and the per capita occupancy for girls and boys being 65 and 76 respectively.

The situation is even worse when one considers the status of working women hostels being supported by the Ministry of Women and Child Development. Introduced as a Central Sector scheme called "Working Women's Hostels" in 1972-73 where grant-in-aid, for construction of new or for expansion of existing buildings to provide hostel facilities to working women in cities, smaller towns and also in rural areas is provided to eligible categories. The objective of the scheme is to promote availability of safe and conveniently located accommodation for working women, with day care facility for their children, wherever possible, in urban, semi urban, or even rural areas where employment opportunities for women exist. In the last more than 40 years, *only 891 hostels have been sanctioned under the scheme with a sanctioned capacity of about 66,299 women and 8532 children in 323 Day care centres.*

Another even more important infrastructure investment required for women is the construction of shelter homes and crisis centres for women victims of violence. For shelter homes, there were two schemes Construction of Shelter Homes and Swadhar-Scheme for Women in Difficult Circumstances. Under both these Schemes, temporary accommodation, maintenance and rehabilitative services are provided to women and girls rendered homeless due to family discord, crime, violence, mental stress, social ostracism or are being forced into prostitution and are in moral danger. Another scheme with the similar objectives/target group namely Short Stay Home (SSH) is also being implemented by Central Social Welfare Board. To assess the performance of both the schemes - Swadhar and Short Stay Home, an evaluation study was conducted by Centre for Market Research and Social Development, New Delhi in the year 2007. The evaluation report had

commented positively on the effectiveness and positive impact of the schemes, however, the point remains that even today there is a lack of shelter home/swadhar ghar in every district of the country.

While until the eleventh plan there was no scheme implemented by GoI for setting up crisis centers. However, the Department of Health and Family Welfare, Government of Kerala, under its Gender Friendly Infrastructure scheme had set up Bhoomika centres in hospitals in 2010 so only trained personnel handle cases of gender-based violence. The Ministry of Women and Development, GoI is also now taking this forward and has proposed a new scheme to step up One-Stop Crisis Centres for women. However, the scheme has not yet been approved and inspite of budgetary allocations in the last year, nothing has happened on the ground.

While lack of data constraints deeper analysis of these sector, it is but clear that women specific infrastructure has been a priority for policy planners and implementers in the country.

IV. Is Gender Mainstreaming Doable in Infrastructure Projects: Mapping of Available Tools and their Application

This lack of desired levels of gender mainstreaming in infrastructure projects in India particularly in the government projects give rise to another very pertinent question. Is it actually possible to incorporate gender considerations into infrastructure projects? Are there enough available tools for gender mainstreaming which could have been used in the above infrastructure policies and projects to bring about gender equitable results? We have thus here tried to thus bring together some of the relevant and useful tools for gender mainstreaming in infrastructure which have been recommended and applied by various national and international development agencies. Table 3 highlights the various tools, their applicability and examples of having been applied on the ground in India by the government or other development agencies working in collaboration with government. These tools which can be applied at various stages of the project cycle, have not only demonstrated that gender is a very important consideration for infrastructure projects but also reinstate the pay offs which these projects have derived by incorporating these concerns.

Tools	Application	Benefits	Example
Gender Action Plans (GAPs)	Setting objectives and action planning for incorporating gender/ women's concerns in infrastructure projects.	Effective GAPs have not only been successful in realizing gender benefits but have also contributed to the achievement of overall project objectives by reducing the vulnerability of women and their families to poverty and by enhancing the sustainability of benefits to the poor. (ADB,2005)	GAP of Infrastructure Development Investment Program for Tourism in India, ADB (RRP IND 40648). The GAP has very clearly brought out institutional measures like "Ensure that all bidding documents include a clause requiring contractors to adopt gender targets for the employment of laborers, the provision of core labor standards (incl. equal wages for work of equal value)"
Gender analysis (GA)	GA allows for a critical assessment of the position of men and women in a given situation, relative to each other, and the determining factors for such positions. At	Studies by the World Bank, the DFID, ADB and the AfDB have all shown that such analysis can help projects to ensure that the specific needs of women are taken into account, the social	India National Highway Corridor (Sector 1) Project supported by ADB. The analysis highlighted that the area was at high risk trafficking source area and accordingly Anti-trafficking component was inbuilt. (Lateef, 2005)

	the heart of GA are three basic questions: *Who does what with what? Under whose control are the resources? Who enjoys the benefits from what and to what measure?*	standing of women is increased, and that appropriate facilities delivering the most needed services are supported.	
Gender Checklist	Gender Checklists guide task managers and implementation teams to plan, design, implement, monitor and evaluate gender-sensitive and responsive infrastructure projects; and assist projects implementers to become both agents for ensuring effective gender mainstreaming	Checklists are very useful for their simplicity and user friendliness which enablers planners and implementers who are not so conversant with gender issues also to come up with innovative women friendly designs (MWCD, GoI)	Gender Friendly Infrastructure Scheme, Government of Kerala. In Kerala it was decided that in the year, 2010-11, a major focus would be on women friendly infrastructure. This included interventions like construction of toilets in public buildings, bus stations, construction of night shelters for fisher women, energy efficient gas stoves within EGS schemes, cheaper rental flats for women who commute, creation of Domestic violence Counselling Desk in public hospitals, etc. (Twelfth five year plan document)
Monitoring and Impact Assessment	Establish gender disaggregated indicators for the project log frame and other monitoring tools. Evaluate the impacts of the project on men and women separately and also the impact of the project on women's productivity, empowerment as also on gender relations	Helps understand if the project is benefiting women as much as men and if the desired gender outcomes have been achieved and necessary gender mainstreaming processes followed.	World Bank Gender Review, 2010. The World Bank review team conducted a desk review of project appraisal documents (PADs) and implementation completion reports (ICRs), and rated all projects systematically for the presence of six methods for integrating gender into projects. Indian projects were also reviewed. Similarly the GoI had also evaluated the Pradhan Mantra Gram Sadak Yojana, which among others very clearly highlighted the impact of the scheme on Maternal Mortality

			Rate.
Gender Profiling and Sex Disaggregated Data	Some form of social and demographic profiling of the area where the infrastructure is to be developed is urged. In particular, using sex disaggregated data but also including social surveys, household interviews and analysis of current available data is promoted	This can help to ensure delivery of the most appropriate services, including those with the biggest impacts on women such as education and maternity services.	District Information on School Education (DISE), Department of School Education, GoI. The department collects and analyses sex-disaggregated data and also publishes gender parity index at annually. Under the SSA, high focus was laid on improving infrastructure and analyzing user data (students) on gender lines provides a good measure of gender inclusion. This has also highlighted the need for a gender specific infrastructure-toilets for girls education.
Involvement and consultation	Ensuring the involvement of women as well as men in consultation and decision-making at all levels. It is also acknowledged that meaningful consultation requires the adoption of practical measures to ensure that project information reaches women, especially poor women who experience more limitations in terms of their time and mobility.	There is consensus within the literature that women's and girls' benefits from infrastructure projects are enhanced when their perspective is included in the design and planning process.	The Water And Sanitation Management Organisation, Gujarat particularly emphasizes of consultation with women in designing and management of water projects as well as promoting women's participation in water committees/all women water committees. (www.wasmo.org) In the Safe Cities Project in Delhi consultation has led to a multi-dimensional approach, which includes along with campaign and awareness, infrastructure measures like building sanitation facilities, providing street lighting, etc. (www.jagori.org)
Gender Specialist/Cell	The inclusion of a gender specialist or a small team with dedicated gender skill sets as part of the project development team	Helps keep focus on gender integration and supports internal capacity building and monitoring.	National Rural Health Mission, and Sarva Siksha Abhiyan, GoI have provision for gender specialist (coordinators) and gender cells at the State level.
Capacity	Training staff at all levels of	Focus on capacity building leads	The MWCD, GoI through its scheme on gender

Building and Gender Mainstreaming Skills	programme planning, implementation and decision making on gender issues and gender mainstreaming tools	to increased gender understanding of project staff which leds to internalization of processes	budgeting has been focusing on training government functionaries in large numbers on gender and gender budgeting. More than 1500 officers have been trained at all levels. (www.wcd.gov.in)
Women's Organisations and networks	By mobilizing women into groups, projects provide pathways for women to connect and organize, and together marshal the courage to try out new ways to better their lives. Many projects are mobilizing innovative, multi-sectoral partnerships to buttress their efforts to reach and support local women to thrive.	It is an empowering approach which also leads to increased women's voices in resource management and other governance issues.	Mumbai Urban Transport Project (FY 2002-2009) The project required resettlement of a large number of people, living in the slums around the rail tracts. A participatory resettlement process for 60,000 people was facilitated with help of a local organization Mahila Milan (promoted by SPARC). The women's federation negotiated for a suitable resettlement location and security of tenure which ensured that they could continue the support systems and economic activities that they had prior to resettlement. Other important aspects of the resettlement plan included joint titling of final resettlement properties between husbands and wives, which has given women more security in their new residences and access to formal banking system (Dickenson n.d.).
Supporting women in employment and other income-generating and asset creation opportunities	There are three key routes by which this work can be undertaken: • By supporting women to enter employment • By supporting them once in employment, including qualitative improvements	Direct impacts, easy to be monitored.	The National Rural Employment Guarantee Scheme is also a similar programme for infrastructure development with a focus on employment generation and with a quota of at least 1/3 of jobs reserved for women, as well as child care facilities at work sites. The result has been that almost 48 percent of the labour days generated have been for women, with a few

	in employment in working terms and conditions; and • By supporting them to participate as part of supply chains and wider economic activity. There is also scope within PPP arrangements to support and promote the employment of women.		micro level studies also showing improved livelihoods and empowerment of women due to the scheme.
Gender Budgeting	Allocate funding to support gender mainstreaming activities. Specifically allocate resources to achieving gender goals, for example by allocating funds for the desired outcomes identified in gender assessments and gender audits as part of infrastructure projects.	Gender Budgeting has been recognized as an effective tool as it ensures that policy or programmatic commitments are translated to budgetary commitments. (UN Women; MWCD, GoI)	Sanchar Shakti Scheme, the Department of Telecommunications (DoT),GoI. The Scheme envisages bringing together the combined efforts and contributions of DoT- Universal Service Obligation Fund (USOF), mobile and Mobile Value Added Service Providers, Telecom Equipment Manufacturers and their partner NGOs. It aims to use ICT to empower rural women through provision of Mobile Value Added Services on issues of concern to women like health, social issues, and government schemes, as also livelihood related inputs and training over their mobile phones. (Twelfth Plan Document)
Delivering accessible services	Undertaking specific initiatives to improve accessibility to services like having a one-window approach, setting usage costs at a rate affordable by women, female headed households, or female-only	Can help women access infrastructure services.	In Ahmedabad, the Slum Networking project, benefited more than 200,000 people by providing access to sustainable urban sanitation facilities through a one-window approach. The program forged partnerships between the municipality, NGOs, the private sector and CBOs - the latter mainly women's groups - to

	parent families and supporting appropriate use of credit and other mechanisms.		implement basic infrastructure services at the slum level. The Ahmedabad Municipal Corporation (AMC) partnered with an NGO the Mahila Housing SEWA Trust (MHT), to champion women's participation on water and sanitation issues, which led to later on the slum women forming a city level federation which not only participated actively in a slum electrification programme in the city but also went on to take led in housing schemes like Rajiv Awas Yojana. The AMC further went ahead to give these women a direct say in the city planning processes by including them in the Ahmedabad Vision 2020 and the City Sanitation Committees. (MHT, Annual Report, 2012)

It can be seen from Table 3 above there are many examples across the spectrum, of using a variety of tools for ensuring gender mainstreaming in infrastructure projects. It is important to note here that most the initiatives have the government as the principal implementer, which shows the high possibility of being able to replicate these tools in all other infrastructure projects too.

Some of the initiatives like Gender Friendly Infrastructure Scheme of the Government of Kerala; the Sanchar Shakti Scheme of the Department of Telecommunications, GoI and the Slum Networking Project by Ahmedabad Municipal Corporation have not only been innovative in nature but apart from targeting gender concerns have been able to target some of the most marginalized women like fisherwomen, tribal women and slum dwellers. This further highlights the need to use these tools as not only a means for gender mainstreaming but for targeting of marginalized and vulnerable communities in general.

Another important inference which emerges from the cases is that most of these have been partnership projects. There has either been a multilateral agency or some local NGO which has been involved in the project which has led to the desired processes being undertaken for visible results. This does indicate that while there is a possibility of being able to mainstream gender in infrastructure projects, and even within public infrastructure projects, the process has not yet been institutionalized within the government. It is not surprising thus that these remain as one-off cases and have never gained entry into the formal infrastructure policies and programmes. Thus even though there is a strong case for incorporating gender concerns in infrastructure projects and demonstrated models on the "How" to aspect on mainstreaming gender, it still remains one of the most neglected areas of infrastructure development.

An interesting example comes from the South African national budget in 1998 which reported on the gender dimensions of some infrastructure projects like Water Supply programmes. It assessed the role of women in this programme as employees (14 percent), trainees (16 percent), contractors (0), consultants (25 percent) and Steering Committee members (20 percent). It also assessed the average time spent by rural women in collecting water (74 minutes) because of lack of tapped water (Sharp 2007).

V. Conclusion

This paper has attempted to bring together the various rationale and gender dimensions involved in infrastructure projects. As can be seen from the analysis, gender is a very important parameter to be considered in infrastructure projects. Therefore if infrastructure projects have to be actually equitable in nature, they have to undertake gender assessments and plan specifically for the needs of women as much as for a general view. We have also attempted to bring together a range of tools and techniques which have been applied within the country and are context specific to be used in infrastructure planning. However, if infrastructure projects have to be really engendered there needs to be a commitment at the highest levels and policy directives issued to ensure that the

gender mainstreaming processes are followed in all projects. One of the most crucial ways of doing the same has already been recommended in the twelfth plan as "All infrastructure projects have to undergo gender audits.". However, even for this to actually happen, there is need to provide the required depth of analysis on a wide range of infrastructure and service delivery sectors in which women's compared to men's infrastructure specific needs can be discerned. Such in-depth and sector-specific gender analysis can create possibilities for aligning planners' views with end-user needs on different forms of infrastructure provision. The ultimate advantage lies in bringing about infrastructural designs and service provision aspects that are responsive to the priorities of different social groupings amongst the country's residents.