Session 4
Sustainable and gender-inclusive urbanisation, settlements and transport infrastructure

2020 Global Forum on Environment

MAINSTREAMING GENDER AND EMPOWERING WOMEN FOR ENVIRONMENTAL SUSTAINABILITY

Paris, 5-6 March
Women and men relate to urban and settlement design and transport infrastructure differently due to different social roles, occupational patterns and preferences. Urban and settlement planning and transport infrastructure that do not take into account the needs of its different users, can significantly reduce economic opportunities and well-being of these users by increasing the time and means they spend on commuting, and, at the same time, contribute to air pollution and inefficient resource use. Urban and settlement development sectors - housing, transport, and land use – have marked implications on gender equality goals through three key dimensions: user patterns (accessibly, safety and affordability), labour market participation (employment and participation in decision-making), and spillover effects (social and environmental). Women’s greater involvement in decision-making in these sectors could help reduce the overall environmental footprint of infrastructure.

Pollution and safety in cities, and implications for women’s health and well-being

Existing infrastructure development and use accounts for around 60% of global greenhouse gas emissions (OECD, 2017), while cities account for more than 70% of the total global carbon dioxide emissions (United Nations, 2017). By 2050 70% of the world population is projected to live in urban areas (86% in OECD countries), an increase from 55% today. Growing urbanisation, combined with the continuous expansion of world population, will exacerbate a number of social and environmental challenges, including congestion, housing shortages, carbon emissions and land degradation. A transformative change needed to make the infrastructure development and operations more sustainable requires a comprehensive cost-benefit analysis, which in turn has to take into account much broader societal implications of infrastructure development, including a gender dimension.

Urban planning and infrastructure development have traditionally been considered gender-neutral. However, it is increasingly argued that due to societal norms related, among others, to women’s role as caretakers and their involvement with the local community, and also their other special needs (e.g. safety), require different design and operations. In addition, many other local complexities and dynamics (e.g. cultural norms) may also require a tailored approach when considering the different needs of men and women (e.g. segregation of coaches in public transport). Worldwide, gender-specific needs are still rarely included in infrastructure development or urban and settlement design and planning, which not only may hamper women’s economic opportunities, but also increase carbon footprint (OECD, 2019c).

Gender-specific impact of urbanisation

The risks of uncontrolled urbanisation, urban sprawl and slums are greater for women for a variety of factors, ranging from higher exposure to or effects of pollutants in housing and outdoors to sex-based violence. Women and children are most exposed to in-door air pollution in developing countries where biomass is still used for
heating and cooking, causing over 4 million deaths a year. As women spend more time at home than men and are more frequent users of cleaning products, they are also more exposed to hazardous chemicals.1

The growth of cities and expansion of urban areas has also led to a growing exposure of the population to outdoor air pollution. Studies have consistently shown that air pollution is most damaging for the health of children, the elderly and women, in particular during pregnancy (see Issues note 3). Furthermore, women account for an overproportionate share of low-income citizens, which tend to be closest to the most polluted parts of cities (e.g. heavy traffic, factories, etc).

Pollution has more intense effects on women through other channels. As they are mainly responsible for caring obligations in the household, they are more likely to be the ones straying at home with children during high pollution days, reducing their employment opportunities. And research also provides a link between air pollution and psychological factors affecting mental and physical health, cognitive performance, and even violent behaviour, of which women are the main victims.

More generally, women are especially exposed to urban living risks in parts of cities which lack safe public spaces (under-lit and under-policed), are poorly connected to safe public transport, and where crime rates can be high. Poorer women are particularly exposed. In both developed and developing countries women represent the largest share of victims of criminal deaths, assaults, kidnappings and sexual harassment. It is estimated that 35% of women worldwide have experienced either physical and/or sexual violence at some point in their lives (WHO, 2013). Furthermore, in some countries, sexual harassment and violence against women is not criminalised (OECD, 2019a). Victims of sexual assaults are also often afraid to seek justice.

**Making cities greener and more women-friendly**

While sprawling metropolises cannot simply be razed and rebuilt with a gender lens, a number of measures can be taken to make housing and cities cleaner, to make streets safer and to keep women more secure when moving around the city.

**Box 1. Women’s activism to reduce pollution in the City of Kitakyushu, Japan**

The City of Kitakyushu developed as a manufacturing city in the beginning of the 1900s and soon became one of the four main industrial zones in Japan, focusing on industries like steel, chemicals, ceramics and cement. Although these heavy industries had a positive impact on the economic development of the city, as well as on Japan as a whole, they also resulted in negative externalities on the environment, generating high levels of air and water pollution, which reached their peak in the 1960s.

Civil society, and in particular associations of women concerned about the health of their families, started a protest against the high level of pollution in the city and launched the slogan “We want our blue skies back”. The movement later involved universities, business community and local government to seek for common solutions to overcome pollution. The campaign achieved remarkable results, with joint efforts contributing to clearing up both the skies and sea water around Kitakyushu in only a couple of decades (end of 1970s).

The movement towards a more environmental friendly economy, combined with the need to rethink the industrial structure of the city due to the crises of the steel industry, brought the City of Kitakyushu towards new industries, including assembly and automobile industry, renewable energy and recycling industry.

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1 More information on the topic can be found in the Issues Note for Session 3.
A number of cities have taken decisive measures to reduce urban pollution, focusing on the worst affected areas, which also tend to have a high concentration of low income households. In the City of Kitakyushu, Japan, a historical example shows how the active role of women’s associations led the city on a new path of sustainable development, due to their heightened apprehension about the health risks caused by the city’s industrial structure (Box 1).

More recently, some cities have taken initiatives to develop specific gender-conscious urban plans. For example, the city of Umeå, Sweden has been developing a gender-based landscape (“gendered landscape” approach) since 2009, mapping all changes in the city with a gender and a sustainability lens. The city has been collecting gender-disaggregated data for the past 30 years, and uses the data to develop mobility and infrastructure policies and projects, taking into consideration women’s more sustainable travel patterns, different income levels, and different interests and needs (Urbact, 2019). This has led to changes in the cities public areas, more lighting in streets that would facilitate access for men, women and children, and changes in the public transport network.

Vienna has been pioneering ‘gender mainstreaming’ for nearly 30 years, and has developed a Manual for Gender Mainstreaming in Urban Planning and Urban Development (Urban Development Vienna, 2013). When developing social or subsidised housing, which constitutes a large part of the city’s total housing market, it uses a four-pronged approach comprising of planning, economic, ecological and socially sustainable pillars. The city’s Housing Fund follows gender-sensitive planning criteria. Wohnprojekt Wien, in the north part of Vienna, is a self-run complex of 40 flats, with low energy consumption, shared mobility options, bike garages, shared rooms and gardens (Energy Portal Magazine, 2018). This model is taking into consideration gender aspects, as many common activities are shared between the inhabitants (such as cooking, shopping, occasionally childcare), who contribute 11 hours of unpaid work per month to the community (copied from previous gender-responsive development examples in the city, facilitate both men and women living in these areas) (Littig & Leitner, 2017).

Some cities in developing countries are also starting to make the urban environment more women-friendly. For instance, the city of Maputo, Mozambique, has launched a safe City and Safe Public Spaces Programme, as part of the UN Women’s Safe Cities Global Initiative. This includes improving street lighting as well as rebuilding abandoned public buildings with a gender perspective in mind.

A more systematic collection of disaggregated data at the regional, local and city level, as well as integrating gender-responsive budgeting and gender and environmental impact assessments in infrastructure programmes and projects, could help systematise gender-mainstreaming in infrastructure development.

Some cities are also expanding green spaces within residential areas and increasing the availability of sports facilities. Such initiatives can especially benefit women. In particular, there is a significant gender gap in physical activity levels, as 30% of men and 37 % of women do not meet the WHO physical activity recommendations.

In developing countries, major concerns include reducing pollution and improving safety, especially for women. For instance the case of Indian households indoor pollution, establishing that women and children are greatly exposed to indoor pollution and are therefore more likely to face the detrimental effects of it (Smith and Mehta, 2003). Additionally, a study by Behera et al. in the region of Chandigarh in India found that the different exposures to indoor pollution are impacted by different socioeconomic classes, therefore implying that disadvantaged women from developing countries are disproportionately affected by pollution and safety (Behera et al. 1997).

In India, SafetiPin was founded in 2013. This is an application (“app”) that aims to help women stay safe by letting users rate streets and areas for safety criteria such as lighting, visibility, people density, gender diversity, security and transportation. It also aggregates safety data, partly provided by its users, for use by local government and planners. SafetiPin now has 51,000 points of data for Delhi alone, and offers users “safest routes”, helping them navigate the city with less risk.
Women and urban mobility

Typical city design, with segregated areas for residences, workplaces and shopping, reflects the one-earner household paradigm and smaller cities of 20th century; commute time between these areas makes it particularly difficult for a single individual – often a woman - to take on a double or triple burden of childcare, breadwinning and elderly care. In the United Kingdom, for instance, one in four women are responsible for taking care of an elder with a chronic illness or disability as well as a child, as opposed to one in six men. There are currently 2.4 million people who are “sandwiched” into providing for both generations.

Figure 1. Time spent on unpaid care work varies by gender and region

![Chart showing time spent on unpaid care work by gender and region](chart.png)

Note: This chart presents the average hours per day spent on unpaid care work by women and men by regions of the world: Middle East and North Africa (MENA), South Asia (SA), Eastern Europe and Central Asia (ECA), Latin America and the Caribbean (LAC), East Asia and Pacific (EAP), Sub-Saharan Africa (SSA) and North America (NA).

Source: OECD (2019), Gender, Institutions and Development Database.

Due to this added pressure (Figure 1), women are twice as likely as men to give up their work and four times more likely to take on part time jobs instead (Holzhausen, 2014). Women are also more often than men obliged to combine multiple jobs. For instance, in the United States 6.7% of women aged 20 to 24 work multiple jobs compared to 4.6% of men in the same age group (Wilson, 2015). The burden is greatest for single mothers, who account for about 5% of all households in OECD countries – five times more prevalent than single father households (OECD Family Database). In the United States, 82.2% of custodial parents are mothers compared to 17.8% custodial fathers (Grall, 2011).

Easy access to affordable children and elderly care facilities are therefore essential to facilitate women’s participation in the economy, while allowing them to fulfil their family responsibilities. Yet, in many countries, access to such facilities is limited or out of reach because of their cost. Developing such services can bring about immediate benefits. For instance, in Hamburg, Germany, the abolishment of a range of fees associated with schooling and day-care and a guaranteed place in kindergarten for children over one year of age, crèche, or other day care institution, has led to more children staying in school until late afternoon. This had also had the effect of supporting women to participate in the labour force, and providing choice and flexibility to families (OECD, 2015).
**Women’s travel patterns and preferences**

Inadequate transport infrastructure more negatively influences women’s economic opportunities, when compared to those of men, as women are generally more sensitive to time constraints and put a higher opportunity cost on travel time (OECD, 2015). For example, changes in commuting distances may have greater impacts on women, who have different mobility patterns, as they are usually responsible for double or triple burden of childcare, breadwinning and elderly care (Kwan, 1999; Kwan et al. 2015; OECD, 2018b). On average, women travel shorter distances, take more trips unrelated to work within the day, use more flexible modes of transport and travel less frequently during peak hours than men due to their domestic and community responsibilities (Moriarty and Honnery, 2005, Ng & Acker, 2018).

Travel patterns may be influenced also by the density of urban sprawl. Urban sprawl generally leads to longer commuting distances, causing loss of time and productivity (OECD, 2018c). It usually creates greater public infrastructure requirements, including for sufficient road network and public transportation, leading to higher public service provision costs and higher living costs for the local population. Taking into consideration that women are the ones in charge of the majority of non-work related travelling within a household, especially when it relates to children, and irrespective of the income disparities between the two sexes, more multifunctional land use and better local transport services can enhance gender equality and drastically enhance women’s economic empowerment (Boarnet & Hsin-Ping, 2015).

High commuting costs may have a negative effect on women’s access to full-time employment in large metropolitan areas. In Tokyo, for instance, women with lower income usually live furthest from the business districts, than men, while higher community costs or high housing prices in the city centre, create obstacles for women to enter the full-time labour market (Yukiko, 2011). Other evidence has shown that increasing the commute time in large metropolitan areas, leads to a 0.3 percentage point drop in women’s participation in the labour force (Black et al., 2014). When making employment decisions, women put greater importance on the convenience of commuting than men, who generally prioritise salary over commute time (Nafilyan, 2019).

Recent studies have also shown that women are also more willing to reduce vehicle use than men, and display a higher preference over public transport modes, such as bus or train, or non-motorised transport modes, such as walking and cycling over driving a car or riding a motorcycle (Polk, 2003; 2004; Ng & Acker, 2018). Some travel surveys and limited gender-based data available for OECD and European countries seem to indicate that women follow a more sustainable travel behaviour (Malgier & Maffi, 2012).

However, women’s more sustainable travel patterns have not been examined thoroughly enough to see how they could further support the decline of private car usage nor to see how they could set the scene for a shift in the travel patterns of men. Also, more analysis would be welcomed to show how these travel patterns are aligned with fluctuations in income, fuel prices and environment-related tax-policies, which lead to changes in demand. Hence, implementing a gender equality lens to the development of public transport networks and emerging mobility services could boost women’s economic empowerment. And at the same time, a dialogue with women users could help policy-makers with integrating gender-based analysis in developing the public transport networks, as well as prioritising more sustainable travel, thus potentially limiting cities’ adverse environmental impacts, including carbon emissions.

**Transport safety as a top priority for women**

Despite this preference, women often do not use public transport for safety reasons. Safety is a top priority for women and a key determinant of their use of public transport. Women in both developed and developing countries have reported feeling unsafe using public transport services (OECD, 2019). Eighty-one percent of females have experienced harassment in public spaces and that category includes public transport and associated public spaces. This is not only morally unacceptable in itself; it also causes economic and social harm, reinforcing inequality (Gonzalez Carvajal, 2019). A 2017 ILO study on safety involving a large-scale survey of women’s use of transport in developing countries shows that limited access to safe transportation is the greatest
challenge to greater participation by women in the labour market, reducing their participation by 15.5 percentage points (ILO, 2017).

Safety is a concern that affects women’s transport behaviour across all transport modes more than that of men and is the top priority insisted upon by women as a condition for their use of public transport (Bray and Holyoak 2015; Tjeendra et al., 2010; Ng and Acker, 2018). This is notably the case in urban areas where more women than men use public transport and heavily depend on these systems for their mobility needs.

Examples provided in the ITF’s Compendium on Women’s Safety and Security: A Public Transport Priority (2018) show that a large majority of women worldwide feel unsafe in public transport and have been victims of some type of physical or verbal harassment and other forms of violence in public spaces. As a result, women often prefer driving when faced with a modal choice, using taxis or other forms of for-hire ride services rather than walking, cycling or using public transport.

For instance, ITF (2018) reports a London survey that found that 28% of women who have used public transport in the past 12 months say they experienced unwarranted staring, sexual comments, bodily contact, wolf-whistling and exposure. In Latin America alone, six-in-ten women say they have been physically harassed while using public transport. The statistics are alarming in many Asian countries as well. Women in Bangladesh face high levels of inequality in livelihood opportunities and access to economic assets. According to estimates, around 94% women commuting in public transport have experienced sexual harassment in verbal, physical and other forms. In Jakarta, nearly 90% of women found the safety of trains to be poor or very poor, whereas only 35% of men held a similar concern for security (Turner, 2013).

If cities want to increase their public transport use and occupancy rates, the safety of their services have to be considered in order to attract more women passengers and also to improve the experience of the substantial share of existing women users.

**Making transport gender conscious**

Measures to make public transport space more women-friendly include infrastructure and operational improvements based on better evidence on transport use by gender, greater security in vehicles and stations, and a zero tolerance approach to harassment.

Vienna has been long hailed as a model city in bringing a gender perspective to transport design. Prompted by a survey in the late 1990s on the use of public transport by men and women, data is collected to determine how different groups of people use public transport and spaces before a transport infrastructure project gets underway (Foran, 2013).

The Los Angeles METRO bus system noted a 39% decrease in total crime and a 60% decrease in operator assaults between 2017 and 2018 thanks to implementing the safety measures that included greater presence of transit and local police, video cameras to document and deter assaults, and training for transit operators on the best ways to de-escalate confrontations (ITF, 2018).

Women’s mobility and use of public transport is also affected by comfort and physical accessibility (CIVITAS Wiki Consortium, 2020). Beyond guaranteeing safe access to bus and metro stations, many times women — as well as elderly or other vulnerable groups - have different needs concerning the vehicle’s design and technology, such as appropriate railings for safe holding, ramps and designated space for access with baby-strollers or shopping bags. In Santiago, Chile, women’s needs and preferences have been taken into consideration when upgrading the bus fleet (ITF, 2019).

**Women in urban planning and design**

Feminist urban designers claim that men and women experience space differently, and are requesting a gender-balanced approach to urban planning, and to the design and construction of public spaces and amenities (Col-
These differences are not only influenced by the socially and culturally constructed productive, reproductive, personal or community gendered roles, but also by other characteristics such as age, income, race etc.

Introducing a more gender-balanced approach to urban design, may also lead to more sustainable infrastructure. In Wallhagen et al (2018), for example, women urban designers participating in a competition in Sweden placed greater importance on environmental aspects than men, even though they felt that their possibility to influence them was rather low. Men urban designers, on the other hand, felt they could influence, even though they rated environmental aspects as of the lowest importance (Wallhagen et al., 2018).

A more participatory approach, by including women in all stages of infrastructure planning design and development, could help include perspectives that might not have been otherwise considered. Ortiz et Gutiérrez (2015) and Fleming (2018) present the case of Collectiu Punt 6, an organisation of female architects and urban planners in the city of Barcelona, which over the last decade have included local women in all stages of urban transformation in the city. As a main constraint to a gender-sensitive approach in urban planning they identify the inability of the relevant public authorities to integrate such an approach in their work, and thereby mainstream gender in urban development. Elsewhere, women’s groups have been also pursuing the goal, sometimes successfully, of empowering local women and turning them into agents of change in their neighbourhoods and cities. This is not only the case in Europe, as seen in the case of Berlin,2 but also in developing countries. The Gender Inclusive Cities Programme (GiPC), implemented in Petrozavodisk, Russia; Dar es Salaam, Tanzania; Delhi, India; and Rosario, Argentina, worked with local women to fill in knowledge gaps on why women and girls felt unsafe is some parts of theirs cities, and were therefore excluded from city life (Women in Cities International, 2018).

Better representation of women in urban design and planning related decision-making and professions could help make cities and settlements more women-sensitive, and, in turn, help optimise infrastructure investments to meet the needs of all population.

**Women in transport**

In order to plan and design transport systems and infrastructure with women in mind, the sector needs more women in the transport workforce. Women passengers also feel safer when they ride with women drivers, who are also safer drivers (World Bank, 2013).

Yet, in on-going research conducted by the International Transport Forum on 47 countries across the world, it was found that female participation in the transport sector was 17% on average in 2018 and some of the countries with the smallest gender gaps are experiencing declines in female participation in the sector. For example, in Europe, the transport workforce is 22% female, and hold less than 10% of technical and operational jobs, despite women accounting for 46% of the total workforce. In the 21 APEC economies, fewer than 20 % of transport jobs are held by women (OECD, 2019a). In the United States, women comprise only 15% of transport and related occupations and only 4.6% of commercial truck drivers are women (OECD Observer 12 June 2015). Increasing female participation in the transport workforce will require measures addressing problems in recruitment, retention and long-term career advancement.

Increasing female participation in the transport workforce will require measures addressing problems in recruitment, retention and long-term career advancement.

In most countries, women are also hardly represented in decision-making positions in infrastructure development. Globally, females only make up 18% of leadership in infrastructure ministries (energy, transport and communications) compared to 38% in socio-cultural ministries (health, education, family and youth) (Wilson Centre, 2018). Moreover, they only make up 16% of leadership in economy and finance ministries, therefore

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2 Several cities have started participatory processes of citizens in their decision-making, such as Berlin (Stadtenwicklung, n.d.)
influencing even less investment decisions in infrastructure development at the national level. Out of the 60 member countries of the International Transport Forum, only 13 countries had female Ministers of Transport in 2019. Having more women on boards of transport companies can also help focus more on women’s needs such as the availability of public transport at off-peak hours, specific transport routes, and personal safety.

The infrastructure gap in low-income countries

The majority of the population living in urban areas in the global South, with the exception of Asia, is now female (Chant, 2013). In Africa, where women have traditionally been engaged in rural activities, urban populations are also becoming more female due to women’s limited access to land ownership, their de facto and/or de jure exclusion from many inheritance laws, as well as their traditional responsibilities caring for elder and others in need in urban areas in the form of unpaid work (Chant, 2013).

In informal urban settlements (slums) with limited access to clean water, waste disposal or electricity, women are often the ones responsible for managing such shortfalls, by spending large amounts of time between chores such as collecting fuelwood and obtaining water, and caring for children or the elderly (Chant, 2013; see also Issues Note 6.1 and 6.2). This tasks them with extra responsibilities, but also provides them with knowledge on local safe water storage, usage practices, and water conservation, among others (Thompson et al., 2017).

In addition, even though men are generally the ones who occupy informal employment positions – usually because of existing social norms, lower educational background or discrimination against women - in some cases, as in sub-Saharan Africa and in Latin America, women are now more present in the informal sector than men, engaging in paid work mainly in the form of domestic and home-based work (OECD/ILO, 2019). However, the transport network does not necessarily provide them with easy access, as it covers mainly routes between the city centre and peri-urban areas, and does not cater to passengers who move within the periphery, travel during off-peak hours, or make many short trips per day (Chant, 2013).

Figure 2. Drinking water, sanitation and hygiene in schools in the Global South


3 More on women’s participation in leadership positions in the government can be found in the Issues Note for Session 7.
Women and girls are also more seriously affected than men by the lack of sanitation infrastructure and amenities in public spaces and buildings. Based on UNICEF’s 2016 data for schools, there are inadequate or no water services in 42% of rural areas in Sub-Saharan Africa, no sanitation services in 29% of rural areas in Central and Southern Asia, and no hygiene services for 51% of rural areas in Oceania (excluding Australia and New Zealand) (Figure 2) (WHO and UNICEF, 2018). Almost 41% of girls in Delhi, India, did not attend school due to menstruation, and this percentage reached 65% in schools with no separate facilities for girls (Vashisht et al., 2018).

In rural areas, quality infrastructure development is a key enabler for economic diversification and trade (OECD, 2007), but women, especially those working in local value chains, are often excluded from decision making in the design and development of such infrastructure. New infrastructure development is often planned with the aim of supporting export-oriented industrial activities, as it boosts trade and economic growth in which women participate less than men, but still bare the cost of negative spillovers. In Africa, poor quality transport infrastructure is responsible for 40% of logistics costs in coastal countries and 60% in landlocked countries (AUC/OECD, 2019).

There is clearly a need for a coherent gender-focused approach in all infrastructure planning and development that alleviates the relative disadvantages that women currently face vis-à-vis men.

**Social and environmental spillovers from infrastructure construction**

Transport infrastructure investment and development have been closely linked to economic growth. However, more and more often, policy-makers are referring to sustainable infrastructure, taking into consideration the environmental and social considerations necessary to guarantee the quality level necessary for peoples’ well-being. Sustainable infrastructure and investment, no matter the size (whether a pipeline of projects, a mega-project, or local-based work), can have profound implications for the environment, as it may contribute to changes in the air quality, in water quality and quantity, in biodiversity and local ecosystems. At the same time, infrastructure development may create new or different jobs, changing the labour patterns and the economic development of the given region. This may have gender implications that would need to be considered.

The G20 Principles for Quality Infrastructure Investment, and the OECD-developed G20 Reference Note on Environmental and Social Considerations in Quality Infrastructure, integrate both environmental, social and particularly gender considerations of infrastructure development. The Reference Note proposes possible measures to help minimise the negative environmental and social impacts, and to make future infrastructure development and investment more sustainable. Among the points raised is also a gender perspective in infrastructure planning, design and development (OECD, 2019b).

In 2017, the OECD developed a Framework for the Governance of Infrastructure, which identified 10 “success factors” for getting infrastructure right and provided policy options for an enabling environment, building on several OECD instruments such as public procurement, budgeting, integrity framework etc (OECD, 2019c). The OECD is currently developing a Recommendation on the Governance of Infrastructure, which will allow for more gender inclusive infrastructure projects, and will ensure gender mainstreaming and direct involvement of women throughout the infrastructure governance cycle.

The risks of transport infrastructure construction on local communities and the environment are highest in countries with low standards of protection and enforcement. The vast share of construction projects in the transport sector are concentrated in developing countries. By 2050 global freight and passenger travel are expected to double, for which 25 million km of new paved roads and more than 300,000 km of rail tracks worldwide. This will lead to additional 85% infrastructure development, of which 90% will be roads (Dulac, 2013). Such major growth in infrastructure, besides the economic benefits it is expected to bring, will certainly have environmental and social effects, potentially damaging tropical environments, with high biodiversity and environmental values (Alamgir et al., 2017). For example, in Brazilian Amazonia, 95% of all deforestation occurs within 5.5 km of a paved or unpaved road (Dulac, 2013). The same trend has been found in other tropical and sub-tropical countries. In these regions, roads can also bring poachers and other undesirable activities including...
illicit mining, smuggling and drug production and migrant movements that affect the often delicate balance of local communities, especially among isolated indigenous groups.

Such effects may touch upon the female population in these areas more than others, as women are often the main caretakers of small subsistence farms from which they may be displaced by road works. Women also often have specific roles in traditional societies such as gathering food and ingredients for medicines from forests which may be affected by infrastructure projects. Women are also affected most by human rights abuses (including sexual crime and violence) and weak labour rights, safety and health risks caused by infrastructure projects.

Integrating gender into sustainable infrastructure policies could be advanced by considering the social and environmental spillovers of infrastructure projects to women. More particularly, one should examine further the impact of these projects on the well-being of women living in communities that will be – positively or negatively – affected by the infrastructure developed. Comprehensive, pre-construction social and environmental risk assessments are essential to ensure effective management of these risks. Unfortunately, both environmental impact assessment that take into account indirect risks (so-called strategic environmental assessments) and social risk analyses are expensive and therefore applied to only a minority of road projects. As minimum, government intervention is needed to ensure that such comprehensive assessments are carried out for the highest-risk projects, such as major roads cutting through forested regions and wetlands or communities. Furthermore, assessments need to be as independent as possible. In practice, their quality varies widely, as responsibility for choosing an evaluator often falls on the operator who may influence the consultant to ensure a lenient assessment.

**Infrastructure resilience to climate-related changes**

Research indicates that women are often more vulnerable than men to the adverse impacts of natural hazards, including climate change related, due to their social and economic status and roles (see Issues Note 3). For example, infrastructure resilience to climate change is a major consideration, given that women and men bear different risk from any disruption to infrastructure (OECD, 2018c).

Prioritising sustainable and resilient infrastructure, which integrates environmental, social and governance (ESG) aspects in all life-cycle phases, would help explore the gender dimensions of such infrastructure – including low-carbon and climate-resilient infrastructure (OECD, 2018d) – by providing valuable insights on how infrastructure can support building more inclusive and just societies.

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4 More on women’s role in traditional societies can be found in the Issues Note for Session 6.1.
Questions for consideration

- What further evidence is there on the impact by gender of different aspects of urban and infrastructure development such as pollution, safety, and mobility?
- What are the main challenges in making urban and settlement design, housing and transport gender- and environment- friendly? What are the trade-offs among different goals?
- How can the design of urban, settlement and transport infrastructure be improved to integrate inclusiveness and environmental objectives?
- Which cities around the world are engaging in taking a gender perspective in urban planning, and what are the lessons learned from these initiatives?
- How can women be more involved in the consultation and governance of urban design and infrastructure projects?
- How can OECD, ITF and other international organisations support the development of more inclusive and greener cities and settlements?
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