



D1.4 Gender guidelines

JUSTNature | Work Package 1, Task 1.6

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ABBREVIATION LIST

Term	Description
A.I.	Artificial Intelligence
DSS	Decision-support System
EIGE	European Institute for Gender Equality
GDPR	General Data Protection Regulation
CiPeL	City Practice Lab
ICT	Information and Communications Technology
KPI	Key Performance Indicator
LGBT+	Lesbian, Gay, Bisexual, Transgender and related communities
M[x]	Month [x]
NGO	Non-Governmental Organization
NbS	Nature-based Solution
UN	United Nations
WECF	Women Engage for a Common Future
WHO	World Health Organization
WS	Workshop
WP	Work Package
T[x.y]	Task [x.y]

EXECUTIVE SUMMARY

Gender empowerment is a key aspect to consider in the just development of Low Carbon | High Air Quality Nature-based Solutions (NbS). In most societies women are more disadvantaged than men, having less access to resources, decision-making and power (Lorber, 2010). Moreover, as a result of the lower income and perceived lower social status of women, they tend to bear inequitable environmental burdens and have less control over environmental decisions as opposed to men, which both have an impact on their health (Bell, 2016). The aim of this document is to contribute to reducing the inequalities with that women face, within the scope of JUSTNature, by means of gender guidelines.

After introducing key concepts and definitions, **Chapter 1** briefly presents the gender empowerment task of JUSTNature project (T1.6) and explains how the gender guidelines are situated within it. Four key fields of action are identified and justified: (1) trainings and guidance, (2) gender analysis, (3) gender sensitive design, and (4) gender evaluation.

Chapters 3-6 contain the gender guidelines, which are practical recommendations for reducing gender inequalities in different tasks of JUSTNature. Each guideline contains the list of responsible partners, describes the relevance of the guideline, and gives recommendations for practical activities supporting gender empowerment. Additionally, in each guideline, there is a checklist for monitoring the implementation of the recommendations.

Chapter 2 covering gender-sensitive stakeholder mapping aims to help the project partners implement the stakeholder mapping activity in T4.1 and power mapping in T4.4 in a gender-sensitive way, ensuring representation and directing attention to gendered power relations. The guideline highlights the importance of gender-disaggregated data collection and gender quota and gives recommendations for how intersectionality and gendered power relations can be addressed during the stakeholder mapping activity.

Chapter 3 covering gender-sensitive workshop and decision-making facilitation is about the basic principles of gender sensitive participatory process management. It is to be applied both to access and quality of participation in workshops (T4.2-4), as well as collective decision-making in co-governance (T7.3). The guideline targets the facilitation team organizing workshops with local stakeholders. It contains recommendations for the whole participatory process, i.e., required skills of facilitators, successful engagement techniques, gender sensitive moderation and communication, and evaluation of the workshops.

Chapter 4 covering monitoring and digital technologies aims at supporting developer tasks to critically reflect on gender relations in the context of digitalization and to ensure that a digital gender empowerment occurs as a result of JUSTNature. It highlights aspects to be considered in the development of indicator framework (T3.1), decision-support tools (T3.3), digital twin (T6.2) and governance platform (T6.3). It covers a wide variety of topics, including gendered digital divides, non-neutral technology, gender-sensitive monitoring, A.I. governance, and gender bias.

Chapter 5 is a training material for presenting gender sensitive urban design solutions on workshops with local stakeholders (T4.3, T5.1). As part of the gender empowerment task, a gender-sensitive urban design portfolio was developed, which will be presented for the consortium on the 1st CiPeL meeting and will be used by the facilitation team on one of the workshops with local stakeholders. This training material is prepared in support of the facilitation team, and it will be presented to them as part of a training dedicated to gender sensitivity. The portfolio is a source of inspiration, based on which a discussion and brainstorming can be started with local stakeholders. The portfolio contains best practices for accessible design, public space security, gender-sensitive affordances and the representation of women in public art and public space elements.

The following table gives guidance on which organization should read which chapter. Note that it is highly recommended to everyone reading the introduction, as it contains key concepts and definitions. By clicking on the titles of chapters in the table, the reader can jump on the selected chapter.

Table 1: Chapters recommended for each partner in JUSTNature

Chapters	Task	EURAC	TUC	TUM	IES	PROSPEX	E2ARC	CHX	UM	INLE	ABUD	ISOCARP	RWI	Planetek	Cities
2 Introduction	All	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3 Stakeholder mapping	T4.1, T4.4	x	x	x		x	x		x		x				x
4 Workshop and collective decision-making facilitation	T4.2, T4.3, T4.4, T7.3	x	x	x		x	x		x		x				x
5 Monitoring and digital technologies	T3.1, T3.3, T6.2, T6.3	x	x	x	x						x		x	x	
6 Urban design	T4.3, T5.1	x	x	x		x	x		x		x				x

1 INTRODUCTION

This document was created as part of the work in [T1.6 Gender empowerment task](#) of JUSTNature research project. The aim of T1.6 is to develop and monitor a strategy that ensures that the gender perspective is properly addressed throughout the project. Gender perspective entails the consideration of gender-based differences in status and power, recognizing how discrimination shapes the immediate needs, as well as long-term interests of people with different genders (EIGE, 2021).

Gender is a key aspect to consider in the just development of Low Carbon | High Air Quality Nature-based Solutions (NbS). In most societies women are more disadvantaged than men, having less access to resources, decision-making and power (Lorber, 2010). In addition, as a result of the lower income and perceived lower social status of women, they tend to bear inequitable environmental burdens (distributional justice) and have less control over environmental decisions (procedural justice) as opposed to men, which both have an impact on their health (substantive justice) (Bell, 2016). Research conducted in the Netherlands finds that women are more exposed to higher land surface temperature and associated health risk than men, which partly owes to the higher concentration of women in urbanized areas without sufficient access to blue and green surfaces (Mashhoodi, 2021). Similarly, research in Italian provinces found that industrial air pollution tends to be higher in areas with a high concentration of women-led households and with high concentration of children, presumably because these households are more likely to be found in neighbourhoods with lower property prices and these groups have less political power to enforce their interests (Germani *et al.*, 2014). To counteract these tendencies, JUSTNature will apply a systemic approach to gender empowerment, by implementing a gender perspective throughout the research and implementation of activities.

The following parts of this chapter introduce the key concepts and definitions in relation to gender empowerment ([1.1](#)) and discuss the approach of the gender empowerment task to provide a context to the gender guidelines ([1.2](#)). The following chapters contains the gender guidelines, which are practical recommendations for implementing gender empowerment in different tasks. [Chapter 2](#) covers stakeholder mapping, [Chapter 3](#) covers decision-making facilitation, and [Chapter 4](#) covers monitoring and digital technologies. [Chapter 5](#) contains training material for presenting gender sensitive urban design solutions on local workshops.

Each guideline begins with the list of partners for whom the guideline was prepared, and a brief description of work, which introduces the targeted tasks and the goal of the guideline. In the following section, there are recommendations for practical activities that serve to fulfil this goal. In case of each recommendation, the guideline provides an explanation about the relevance of the recommendation, identified risks and barriers, and strategies to overcome them. Finally, there is a checklist for monitoring the implementation of the recommendation. **Partners will be requested to fill out this checklist at the end of the targeted task, which will be enclosed in the report on gender monitoring due in M24 and M54.** Checklists can be found both in the guidelines and in the Appendices.

1.1 Key concepts and definitions

According to the definition of the WHO, **gender**

“[...] refers to the characteristics of women, men, girls and boys that are socially constructed. This includes norms, behaviours and roles associated with being a woman, man, girl or boy, as well as relationships with each other.” (WHO, 2021).

Not everyone can identify themselves with the gender assigned to them at birth and as they are raised (e.g. transgender people). Moreover, not everyone can identify themselves within the binary system of being women or men (e.g., gender-fluid people). Therefore, the concept of **gender identity** was introduced, which means

“ [...] each person’s deeply felt internal and individual experience of gender, which may or may not correspond with the sex assigned at birth, including the personal sense of the body (which may involve, if freely chosen, modification of bodily appearance or function by medical, surgical or other means) and other expressions of gender, including dress, speech and mannerisms.” (ICJ, 2007).

It should be noted that gender (used here in a binary sense) and gender identity (understood as a spectrum) are rooted in different theories and serve different purposes. While gender and related terms (gender equality, intersectionality, gender mainstreaming) are useful to address the historically developed and socially constructed inequalities with that women face, gender identity can help conceptualize the experiences of transgender people and people with non-binary gender. Since the JUSTNature gender empowerment task is primarily concerned with reducing the inequalities that women face, it operates with gender and related terms.

Gender contributes to the hierarchical structure of society, producing and reproducing inequalities. In most societies, women have unequal access to power, resources and decision-making. In comparison with men, women tend to earn less for the same work, they are less likely to be recognized and get promoted, and more likely to do the housework and childcare (Lorber, 2010). Even cities tend to favour men over women; since traditionally city planning is a male-dominated profession, it all too often fails to consider the needs of women (Hayden, 1980). While in most fields, gender disadvantages women compared to men, it bears noting that gender can also disadvantage men. For example, in most countries, men are expected to do dangerous work, including firefighting, policing or serving in the army (Lorber, 2010).

The absence of such role models is a step toward **gender equality**, which means that the rights, opportunities and responsibilities of women and men, boys and girls do not depend on whether they were born to be male or female.

The inequalities that are produced and reproduced on the basis of gender, intersect with other social and economic inequalities (Crenshaw, 1989). Certain groups of women are especially vulnerable, not only because they are women but also because of other contributing factors, such as their race, color, language, religion, political or other opinion, national or social origin, association with a national minority, property, birth or other status (EIGE, 2021). This phenomenon is called **intersectionality** in the literature. For instance, the inequalities which a white middle-class woman living in a good neighbourhood faces are quite different from those experienced by a woman of colour living in a poor neighbourhood. Therefore, for reducing gender inequalities, the solutions should always consider other social characteristics interplaying with gender.

To reduce gender inequalities, the concept of **gender mainstreaming** has been developed in policy-making circles (Daly, 2005). According to the definition of the United Nations (UN),

mainstreaming a gender perspective is the process of assessing the implications for women and men of any planned action, including legislation, policies or programmes, in all areas and at all levels. It is a strategy for making women's as well as men's concerns and experiences an integral dimension of the design, implementation, monitoring and evaluation of policies and programmes in all political, economic and societal spheres so that women and men benefit equally and inequality is not perpetuated. The ultimate goal is to achieve gender equality (United Nations General Assembly, 1999).

By this, gender mainstreaming can help in JUSTNature by avoiding **gender blindness**, i.e. the failure to recognize the different roles, responsibilities and diverse needs of women and men, which result from the complex functioning of gender, and **gender bias**, i.e. prejudiced actions or thoughts which presuppose that women are not equal to men (EIGE, 2021).

1.2 JUSTNature's approach to gender empowerment

For meaningfully contributing to the empowerment of women in JUSTNature, four key fields of action were identified, (1) trainings and guidance, (2) gender analysis, (3) gender sensitive design, and (4) gender evaluation (**Figure 1**).



Figure 1: Key fields of action in gender empowerment
(Source: JUSTNature; Source of central image: pch.vektor/Freepik)

While the integration of gender questions is an important part of Horizon 2020 calls, according to the assessment of the first two years of the programme, only a few projects developed a real gender perspective in the research content and research design, and projects rarely implemented gender sensitivity trainings (de Cheveigné *et al.*, 2017). In a research project like JUSTNature, a real gender perspective can only be achieved as a cooperative action of the consortium. Therefore, as a first step, a **gender sensitivity training**¹ was organized for selected consortium members (**Appendix 7.1**), and further trainings will be held in relation to specific topics. The trainings help the consortium members internalize the gender perspective and enable them to effectively use the task-specific **gender guidelines**, introduced in Chapter 2–6. The gender guidelines are practical recommendations on how to integrate and implement a gender perspective in different tasks of the project.

¹ By gender sensitivity we mean the ability to understand and to consider gender-based exclusion and discrimination in the context of the social and cultural factors which shapes them.

Secondly, since gender and the questions of gender inequality are always context dependent, a **gender analysis** will be conducted in each CiPeL. As part of the work in WP2, it will broadly map the level of gender equality on the national and local level by reviewing demographic data and by conducting interviews with local gender experts. The assessment will be refined and extended with site-specific needs, by building on the collection of local knowledge in WP4 and will define potential points of intervention from the viewpoint of gender equality.

Thirdly, a **gender-sensitive design** of solutions and methods will be used in participatory processes (co-creation, co-governance) and spatial interventions (nature-based solution design, NbS) as well (WP4, WP5, WP7). These solutions and methods will rely on best-practices backed with scientific evidence, and the needs and ideas of local stakeholders.

Finally, for the **gender evaluation** of gender-sensitive solutions and processes throughout the project, gender sensitive indicators are developed, and monitoring will be implemented. Additionally, as part of the gender guidelines, checklists are developed, which will be used for self-assessment by consortium members being responsible for the tasks targeted by the gender guideline, and for the gender reporting (D1.5).

As mentioned before, for a successful gender empowerment within JUSTNature, a collective engagement is needed from the consortium. In the following figure, the expected roles and responsibilities of different consortium members are highlighted (Figure 2).

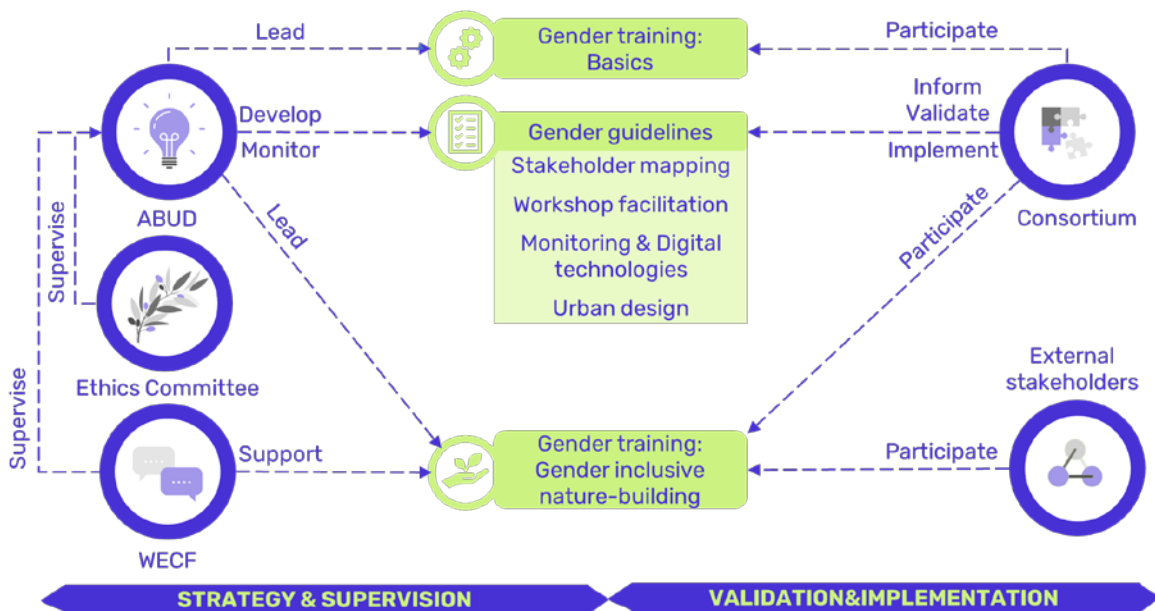


Figure 2: Roles and responsibilities of partners within the gender empowerment task (Source: JUSTNature)

1.3 Methodology of developing the gender guidelines

Although the gender perspective is relevant in all parts and levels of the project, the gender guidelines focus on selected work packages (WPs) and tasks of JUSTNature research project, in which dealing with gender inequality is of utmost importance. Without this, the gender guidelines would remain too broad and general for practical purposes, and the research project would likely fail to address meaningfully gender-related questions. Therefore, as first step of developing the gender guidelines, WPs 2, 3, 4, 5, 6, and 7 were selected that can be potentially targeted by the gender guidelines, based on the research proposal (Figure 3).

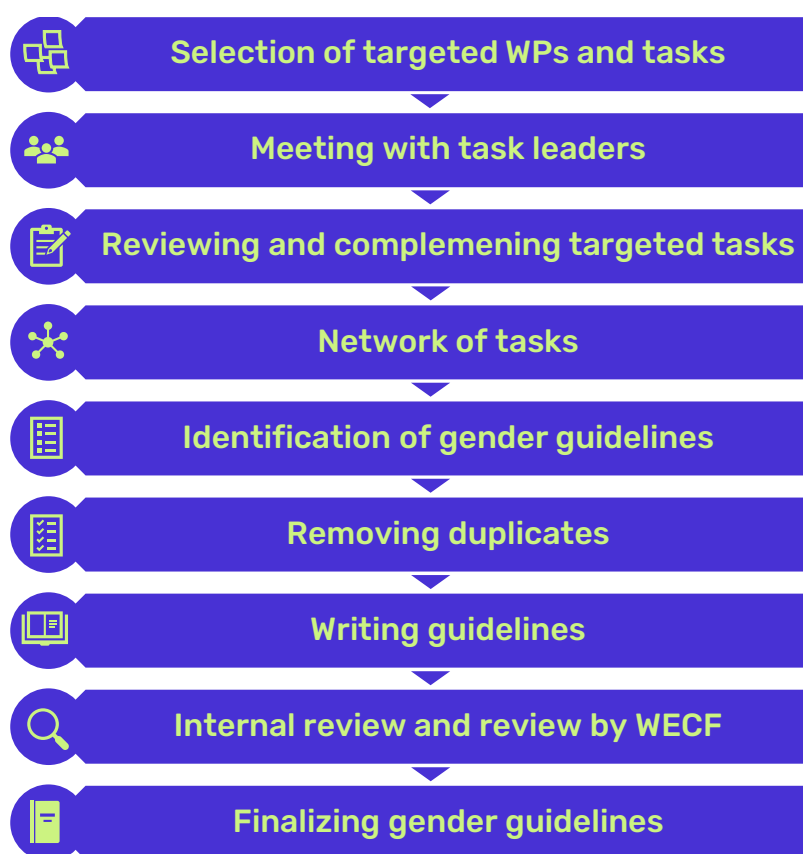


Figure 3: Methodology of developing the gender guidelines of JUSTNature
(Source: JUSTNature)

Second, to understand better the planned activities of the tasks targeted by the gender guidelines (targeted tasks), bilateral meetings were organized with partners responsible for each task. Based on these discussions, the list of targeted tasks was revised and complemented (Figure 4).

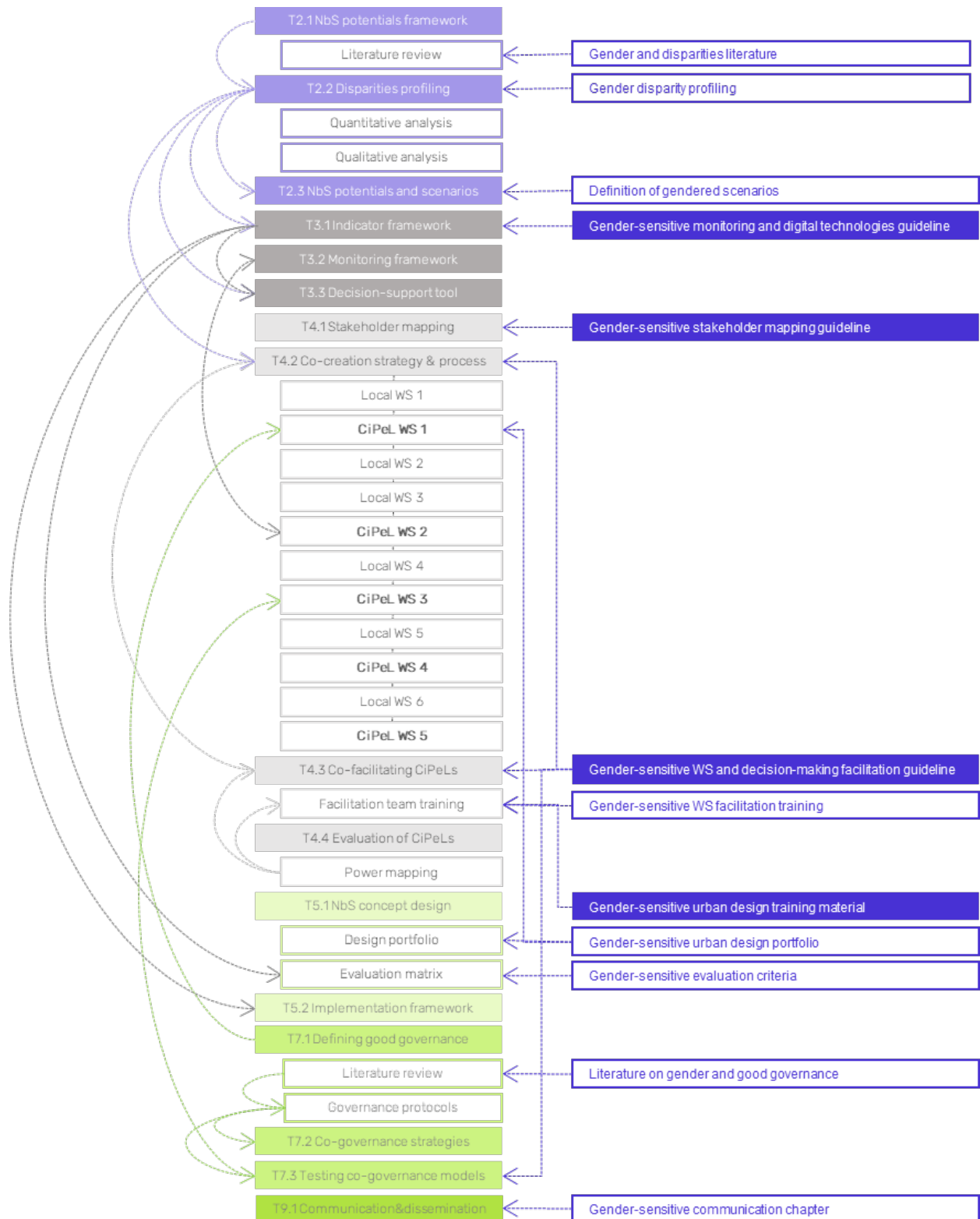


Figure 4: Tasks targeted by the gender guidelines and the connections between them (left), and the identified gender guidelines and related tasks (right). Gender guidelines are marked by blue, while related tasks by white. (Source: JUSTNature)

Afterwards, the connections between the targeted tasks have been drawn up, to define the most effective points of intervention of the gender guidelines, i.e. what kind of gender guidelines are needed and for which tasks. For example, the results of T3.1 (indicator framework) gives direct inputs to T3.2 (monitoring). Therefore, it is enough to provide a gender guideline for T3.1. Moreover, this exercise also helped identify overlaps between the gender guidelines targeting different tasks. For example, the gender sensitive workshop facilitation can be useful for both T4.2 and T4.3.

Finally, the gender guidelines were developed, based on inputs collected from partners and the review of literature and existing gender guidelines. After writing the first draft, partners leading the selected tasks, members of the Ethics Committee as well as Women Engage for a Common Future (WECF), as external advisor, are requested to review the document. The WECF is a global network of more than 250 organization engaged in gender justice and planetary health (WECF, 2023).

2 GENDER GUIDELINE FOR STAKEHOLDER MAPPING

Relating task	Recipient
T4.1 Co-identification and mapping of stakeholders and initiatives (M1-M10)	PI, TUC, TUM, E2ARC, EURAC, ABUD, UM KYDON, MUC, LEU, MERANO, COBZ, GLC, SMJVO
Task 4.4 Observation and evaluation of the CiPeLs, focusing on power structures, possible disparities and the identification of countervailing measures (M12-M54)	EURAC, PI, TUM, TUC, E2ARC, ABUD, UM KYDON, MUC, LEU, MERANO, COBZ, GLC, SMJVO

2.1 Description of work

This gender guideline aims to help the project partners implement the stakeholder mapping activity in T4.1 in a gender sensitive way. In T4.1, a stakeholder mapping activity will be conducted in each CiPeL, led by Prospex Institute (PI). The aim of the activity is to identify individuals and organisations (e.g. practitioners, private sector actors, policymakers, public administration staff, scientists and civil society) that either (a) can be directly involved in the CiPeLs at the local level; or (b) are interested in replicating or upscaling the CiPeLs in neighbouring regions or at a larger scale. The stakeholder mapping will be based on the Prospex-CQI method (Gramberger *et al.*, 2015). Accordingly, Prospex Institute will define a set of criteria and categories of stakeholder groups (C) and determine a minimum quota for each group (Q). The actual identification of individuals (I), i.e. stakeholders, is the task of the respective city partners and attendant project partners, while Prospex Institute monitors the compliance with the determined quotas, power relations between potential stakeholders, as well as their stake in and commitment to the project².

The aim of the gender guideline for stakeholder mapping is to ensure that:

- women and men, girls and boys are equally represented among the selected stakeholders,
- the stakeholder analysis is conducted with attention to gendered power relations.

² The description of T4.1 is based on the project proposal and the information provided by Prospex Institute for the gender guideline.

Equal representation and the analysis of power relations is a key step for making sure that the needs and interests of women and men, and girls and boys, will be assessed in the research, and women and men will benefit equally from its results.

According to the most common definition, “stakeholder in an organization is any group or individual who can affect or is affected by the achievement of the organization’s objective” (Freeman, 2010). Although, this definition is usually seen as a good starting point of stakeholder mapping and analysis, there is a common viewpoint of researchers and practitioners that it is too broad for practical purposes (Achterkamp & Vos, 2007; Mitchell *et al.*, 1997; Olander, 2007). The need for a narrower definition emerged together with the recognition that all the actual, potential and sometimes conflicting interests cannot be addressed because of objective constraints like time and energy (Mitchell *et al.*, 1997). Narrowing the definition is ultimately a normative action. Specifically, it requires drawing boundaries between who should be involved and who should not and, as a consequence, which issues should be involved and which issues should not (Achterkamp & Vos, 2007). While it is not the task of this guideline to develop a narrower definition of stakeholders, it intends to influence this normative act of boundary drawing by highlighting that the definition and the identification of stakeholders should be implemented with attention to the peculiar social positions and experiences of different genders (see ‘intersectionality’ above). The following guideline provides practical recommendations for how to involve *women* and *men*, as well as *girls* and *boys*, instead of *gender-neutral* stakeholders, in the project, which is a precondition for involving gender-specific issues in the project. The full checklist of the guideline can be found in [Appendix 7.2](#).

2.2 Gender-disaggregated data collection

Request information from the stakeholders about their gender, if possible. Consider the requirements of GDPR and local regulations on data protection.

Women have a peculiar position within society. They are more likely to have lower paid jobs, they are more exposed to sexual harassment, they are typically the ones who do most of the unpaid care work within the family, and so on (Procher *et al.*, 2017). Stemming from this experience of being a woman, women have particular interests, needs and concerns, which can only be adequately represented in a decision-making process, like the co-design and co-governance of NbS, only by them (Philips 1995). Gender disaggregated data collection is an important tool to understand the gender composition of the involved stakeholders and

check whether it is balanced. Aggregated data fail to capture the underrepresentation of women among the stakeholders, which ultimately leads to the neglect of their needs and interests.

Because of practical limitations, in the first stage of the stakeholder mapping, it is acceptable to rely on the assumptions of the mappers (i.e. the city partners and the attendant city partners) on the gender of stakeholders to estimate the gender balance within the stakeholder group. However, after the actual involvement of stakeholders, it is not an adequate solution to label the potential stakeholders with a gender, judging by their names or appearance. Instead, they should be asked anonymously about with which gender they identify themselves. Since not everyone can identify themselves with being male or female, it is important to have categories like 'non-binary gender/other' and 'prefer not to say' options.

Gender is personal data, and in gender data collection, data leakages can lead to negative consequences to the data owner (here, the stakeholder). Therefore, stakeholders must be informed why information about their gender is collected, and it is strongly advisable to handle gender data with care, in line with the data protection strategy of JUSTNature (D10.1). A solution could be that the database, which contains all the collected data of the stakeholders, is accessible only for selected members of the consortium (i.e. selected member of PI). Another option is that the gender data is collected anonymously. The disadvantage of the latter is that in this case gender data cannot be used in the analysis of power relations between stakeholders.

CHECKLIST

To comply with the guideline, partners are instructed to label all stakeholder data with gender information during stakeholder mapping, without compromising the protection of personal and sensitive information. Use the action items below to report compliance.

- Information about the gender of stakeholders was requested.
- JUSTNature data protection strategy was followed in relation to collecting and processing stakeholder data.

2.3 Gender quota

Set up a gender quota and monitor its fulfilment. Identify potential barriers of meeting the quota and develop strategies to overcome them.

Up until today, women are all too often excluded from decision-making processes, which can be seen for example in the underrepresentation of women in every national government of the European Union (EIGE, 2022a). The non-participation of women in decision-making processes can be attributed to structural reasons, like the different educational opportunities of women as opposed to men, and the expected roles and responsibilities of women in society (Lorber, 1994). To avoid such imbalances in the co-design and co-governance processes of JUSTNature, it is recommended to set up a gender quota. The gender quota, which defines a certain percentage of seats to be allocated to women, is a positive measure that aims at ensuring a gender-balanced participation and representation in a decision-making process.

In line with the share of women among humans, ideally there should be as many women as men among the stakeholders, but at least the proportion of women and men should be within the range of 60/40% or 40/60%³. When organizing the different JUSTNature local stakeholder workshops, a gender quota will be established accordingly, following the Prospex-CQI methodology (see above).

It should be noted that there can be certain circumstances that can potentially lead to the underrepresentation of men among the stakeholders. For example, since child-care is traditionally assigned to women (both within a family and in early education), in case of the redevelopment of the schoolyard in Szombathely, women might outnumber men in participation. It goes without saying that such a situation should be similarly avoided as the underrepresentation of women. Since there are professions that are more likely to be chosen by one or another gender, it could be the case that simply the selection of stakeholder categories makes it difficult to meet the gender quota. For example, if care-related professions are over-represented in the stakeholder categories, it could easily lead to the overrepresentation of women (Lorber, 2010). Therefore, it is recommended to conduct an ex-ante analysis of stakeholder categories in terms of gender to see if the gender of the stakeholders could be assumed based on the category.

³ Regarding people with non-binary gender, it is hard to set up such a quota, since statistics rarely assess their share in the society. Instead, it can be suggested to involve stakeholders through NGOs of LGBT+ community.

If a gender-imbalance can be assumed, one solution may be to review and adjust the stakeholder categories to reach a more balanced gender composition.

There is a risk that even if the gender quota is met, women and men are unequally distributed among the different stakeholder groups. For example, it could be the case that women and men are equally represented, however, women are overrepresented among the non-professional stakeholders (civic stakeholders) while underrepresented among stakeholders who are selected based on their profession (e.g. private sector actors, policy makers, etc.). It can be assumed that a male professional actor has more power to represent their interest than a female civic participant, and thus such a distribution of genders could reproduce gender inequalities. Therefore, it is recommended to meet the gender quota both in case of professional and non-professional stakeholder categories.

CHECKLIST

To comply with the guideline, enforce a gender quota during stakeholder mapping. Use the action items below to report compliance.

The share of male and female participant is 50/50%, or at least it is within the range of 40/60% or 60/40% both among professional and non-professional stakeholders.

2.4 Intersectionality

Consider differences within gender, and the intersection of gender and other inequalities.

As mentioned in the introduction, gender inequalities intersect with other social and economic inequalities. As a result, there could be larger differences between two women than between a woman and a man. For example, if only white, middle class, young women are involved in the project, it can be assumed that they do not represent well the needs and interests of local women. Therefore, it is necessary but not sufficient to set up a gender quota, and attention should be paid to other social variables as well during the stakeholder mapping.

There is no agreed upon list of social characteristics that should be considered in an intersectional analysis. For the JUSTNature project, the following list is proposed, however, it can be extended and revised based on the feedbacks of project partners:

- gender
- gender identity
- age
- sexual orientation
- racial and ethnic origin
- family care work
- social status
 - education
 - income/wealth
- type of employment
- religion
- disabilities

Many, if not all of these social characteristics are integrated into the JUSTNature stakeholder mapping and Prospex-CQI methodology (see above).

To ensure such an intersectional approach, it is vital to understand the social context of each CiPeL. This includes who the vulnerable groups of the neighborhood⁴ are, what the ethnic, religious, age, and social status composition of the local community is, and what the specific gender-related issues are. This task should be part of T2.2.

It is recommended to collect information about the age of stakeholders, and to analyze the data disaggregated by gender for understanding the age and gender distribution among stakeholders. It is not reasonable to ask specifically the age of the participants, then one could alternatively pose the question in terms of age categories. It can be assumed that the number of stakeholders will not be large enough to ensure proportional representation⁵ of each age groups per gender. Therefore, the goal could rather be to make sure that broad age groups per gender are represented among stakeholders. Nevertheless, if the local demographic data or interviews reveal that one or another age group is overrepresented in the area of a CiPeL (for example it is in an aging neighborhood), special attention should be paid to them during the stakeholder mapping activity. For the involvement of different age groups, it is suggested to establish contact with NGO's and private and public institutions dealing with specific age groups, for example schools, elderly clubs, etc.

⁴ Neighbourhood is an (at least partially) residential area of a district, which feels like distinct unit, either because it has its own history and identity, or residents may have similar types of families, incomes, and education level

⁵ In accordance with their share in the local society, according to local demographic data.

As opposed to age, it is harder to collect information about the other social characteristics, since they are considered particularly sensitive data by GDPR. Therefore, it is recommended to identify vulnerable groups based on the analysis of the social context and interviews with people with local knowledge, and based on this, to contact relevant organizations as well as local social workers. In the case of the organizations, it is important to check, whether there is specifically a women- and men-focused organization of the same type (e.g., homeless shelter for women, women's right organization, school for girls, etc.).

Some general recommendations for potential organizations to contact:

- gender: women's right organization, women- and men-focused organizations
- gender, gender identity, sexual orientations: NGOs of LGBT+ communities
- age, parenthood: maternity clubs, public and private pre-school, elementary and secondary school for girls and boys
- age, societal status: public and private education for girls and boys
- age: university, elderly club and elderly home for women and men
- religion: churches, NGOs of religious communities for women, men, girls and boys
- racial and ethnic origin: relevant NGOs for women and men (e.g. refugee accommodation)
- societal status: homeless shelters for women and men
- general: local social workers

For further recommendations for successful stakeholder engagement see [Chapter 3](#) on gender sensitive workshop facilitation. Moreover, it may be warranted to conduct anonymous surveys among the involved stakeholders and request information about characteristics like ethnic origin, to check, whether the vulnerable groups of the neighborhood are represented among the stakeholders. If a vulnerable group is not represented, actions should be made to engage stakeholders from the non-represented group.

CHECKLIST

To comply with the guideline, specific vulnerable groups are to be identified, characterised by gender and at least one additional demographic or social risk factor. These vulnerable groups are unique to each locality, thus the partners conducting area analyses are instructed to rely on local knowledge to find these groups and recognize their unique needs. Use the action items below to report compliance.

- The local social context was analysed in terms of age, social status, religion, racial and ethnic composition. Vulnerable groups are identified, and in this context, gender inequalities are assessed, as part of T2.2.
- In line with the analysis of the social context, relevant private and public institutions and NGOs are identified, with special attention to gender-specific organizations.
- Anonymous surveys are conducted among the stakeholders to check, whether local vulnerable groups are represented.

2.5 Analysis of gendered power relations

Analyze gendered power relations and take measures to counteract power-imbances

The stakeholder mapping activity includes discovering the relative influence and interest of identified stakeholders in the co-design and co-governance of NbS in the different CiPeLs. An important aspect of this work is the detection of power imbalances indicated by gender relationships, as part of T4.4.

Gender relations are power relations. Women are usually expected to be fragile, quiet, passive, and dominated, as opposed to men being expected to be tough, outspoken, active, and dominant. These expected gender behaviors are internalized through socialization from the early childhood, and produced and reproduced out of human interactions and social life (Lorber, 1994; Young, 1980). For example, women being taught to be passive and subordinate are less likely to actively participate, express their opinion, and represent their interests, in discourse publicly. Their non-participation in public, however, strengthens the existing power relations and the dominance of men (Bell, 2016). Failing to understand these power relations between male and female stakeholders could risk the meaningful involvement of women in the co-design and co-governance activities in the CiPeLs and could set back the opportunity of women for representing their interests.

It should be noted that gendered power relations are intertwined with other kind of power relations (Oldersma & Davis, 1991), which could be formal (e.g., authorities vs citizens) and informal ones (based on the social characteristics being discussed in the previous section about intersectionality). Moreover, it is important to highlight that power relations are always context dependent. Just because a woman is subordinate under certain circumstances does not imply that she will be subordinate among the JUSTNature stakeholders.

For example, her special combination of social characteristics (like being a white, upper-class woman) can make her dominant relative to the other stakeholders (like ethnic, lower middle-class people).

One solution for the analysis of (gendered) power relations is to draw up the networks of stakeholder relations in the form of a graph, indicating assumed power relations between them, based on their gender and other contributing societal factors. In the graph each node is a stakeholder, the size of the nodes indicates the relative influence of the stakeholders and the edges between the nodes indicate the power relations. Such a map can help in making assumptions about the future behavior of stakeholders in the co-design and co-governance processes and develop strategies to counteract them if needed (Prell *et al.*, 2009; Schiffer & Waale, 2008).

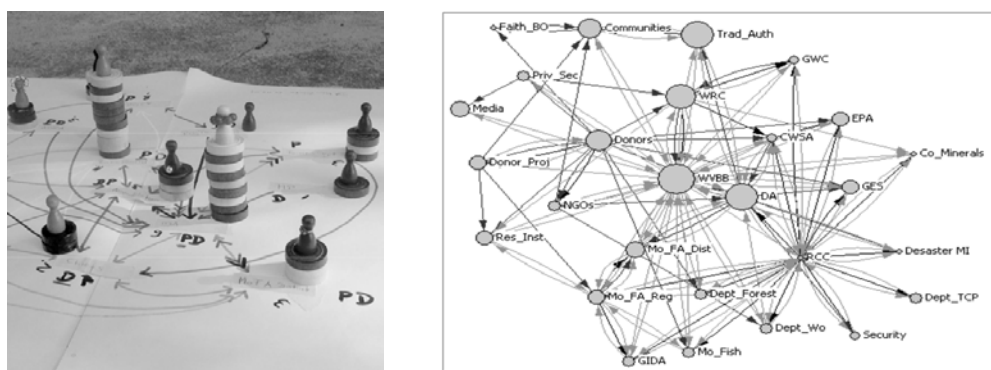


Figure 5: Example for a graph (right) and the canvas used for its co-creation (left), indicating the relationships and the relative power of stakeholders in a development project (Source: Schiffer and Waale 2008)

For a thorough analysis of power relations, information is needed about the social characteristics of stakeholders, which is considered to be particularly sensitive according to article 9 of the GDPR. Therefore, it is possible to collect such information in JUSTNature only in a way that it is detached from the individual stakeholders, which sets a serious barrier to the mapping of power relations between stakeholders. As a potential solution, it can be recommended to rely on the perceptions of power relations of the stakeholders themselves. Power-mapping activity will be further discussed and implemented within T4.4. For further recommendations on detecting power imbalances during a workshop, see [Chapter 3](#) on gender sensitive workshop facilitation.

CHECKLIST

To comply with the guideline, dedicated methods to monitor gendered power relations are to be deployed. Use the action items below to report compliance.

- A power map of stakeholders was drawn up and analysed.

3 GENDER-SENSITIVE WORKSHOP AND COLLECTIVE DECISION-MAKING FACILITATION

Relating task	Recipient
Task 4.2 Co-designing the city practice lab overall process and strategy (M1-M54)	PI, All partners
Task 4.3 Co-facilitating the local operationalization of the city practice lab (M1-M54)	E2ARC, PI
Task 4.4 Observation and evaluation of the CiPeLs, focusing on power structures, possible disparities and the identification of countervailing measures (M12-M54)	EURAC, PI, TUM, TUC, E2ARC, EURAC, ABUD, UM KYDON, MUC, LEU, MERANO, COBZ, GLC, SMJVO
Task 7.3 Test co-governance models and supporting interventions to enable nature-building communities in the CiPeLs (M18-M52)	ABUD, EURAC, TUM, ISOCARP, TUC, UM, E2ARC, KYDON, MUC, LEU, MERANO, COBZ, GLC, SMJVO

3.1 Description of work

This guideline is about the basic principles of gender sensitive process management, concerned with participatory processes. This includes access and quality of participation in workshops, as well as during collective decision-making in co-governance. In general, the guideline targets everyone in the JUSTNature consortium, who is organizing workshops in the project, but also those who facilitate participation in NbS co-governance beyond the project, e.g. nature-building communities, municipalities. Specifically, the guideline targets the facilitation team organizing workshops with local stakeholders. In case of the facilitation team, a training on gender sensitive workshop facilitation will complement the guideline.

As a result of structural gender inequalities, women tend to have less access to decision-making and power (Lorber, 2010). Such inequalities are present in a workshop environment too. Due to gender roles, which construct women as “carers” socially, the majority of unpaid household responsibilities belong to women, while most women are also present in the paid labor market. It leads to the so-called “double day” of paid and domestic work, which can set a barrier to the participation of women in citizen meetings (Bell, 2016). Moreover, in case of participation, women and men often have different perceptions of the same communication environment. Men are likely to speak up more freely, while women tend to

stay silent. Men get more time to speak, while women are more likely to be interrupted (Adam, 2002). Even in cases when women outnumber men in a workshop, it happens, that men dominate the discussion. It is also common that the opinions, ideas and concerns of women are silenced, trivialized and ridiculed (Bell, 2016). It is even harder to have a word, if someone is underprivileged in multiple way, for example being an ethnic elderly woman (Crenshaw, 1989). As a result, there is a risk that the experiences and knowledge of these already marginalized social groups would remain hidden in a workshop. Therefore, the aim of this guideline is to support the equitable participation of people with different gender and social background by paying attention to their different opportunities and capabilities.

The guideline gives recommendations for the preparation, implementation, and evaluation of co-creation workshops and collective decision-making processes. It lists skills, which are necessary for facilitating a gender-sensitive workshop and collective decision-making (3.2) and suggests solutions for successful engagement (3.3). Moreover, it provides recommendations for creating an environment, in which people with different gender feel comfortable to participate actively in a conversation and decision-making processes, and proposes solutions for mapping tacit knowledge of participants, which would likely to be silenced in a non-gender sensitive environment (3.4, 3.5, 3.6). Finally, it suggests ways for the evaluation of the co-creation and collective decision-making (3.7). The guideline relies on existing guidelines and policy-documents, scientific literature, as well as professional experience in workshop facilitation. The full checklist of the guideline can be found in [Appendix 7.3](#).

3.2 Preparation: Required skills for gender-sensitive workshop facilitation

The facilitation team in each CiPeL should be gender-balanced, and at least one of them should have knowledge in socially sensitive workshop facilitation.

Gender balance should be ensured within the facilitation team (Eggerts, 2019), i.e. there should be a female and a male facilitator on the workshops. It can help in the communication with people with different gender and counteract unconscious bias of the facilitation team of CiPeLs.

Workshop facilitators should aim to be sensitive to problems of gender inequality and intersectionality on the workshop, and should be able to counteract them, if needed. Specifically, workshop facilitators should be aware that gender and its intersection with

ethnicity, age, sexual orientation, etc. could set a barrier to the active participation of some women and men in the workshop (Parés Martin *et al.*, 2020; WOMEN2030, 2018). They should consciously use facilitation methods and tools to enhance the participation of the less powerful groups.

Workshop facilitators should be aware of their own bias and preconceptions of different social groups (e.g. women/men, poor/rich, educated/uneducated, members of the LGBT+ community, people of different ethnic origin, etc.). Such bias and preconceptions can affect the way the workshop facilitator communicates, what she or he makes joke about and what kind of examples she or he brings up (WOMEN2030, 2018). Recognizing our own preconceptions and biases can help in overcoming them.

CHECKLIST

To comply with the guideline, partners engaged in workshop facilitation are instructed to select facilitators meeting professional standards and project trust to identify and handle gendered causes of uneven participation in workshops. Use the action items below to report compliance.

- Gender-balance is ensured within workshop facilitators per CiPeLs.
- Workshop facilitators are aware of how gender and intersectionality can set barrier to the active participation of some stakeholders on the workshop and are able to use facilitation methods and tools to ensure equal and fair participation.
- Workshop facilitators are aware of their own preconceptions and personal biases.

3.3 Preparation: Successful engagement

Encourage people with different gender to participate on the workshop. Consider factors which can hinder the participation of people with different gender and of different social groups.

The importance of gender-balance among stakeholders has already been discussed in the stakeholder mapping guideline, where setting up a gender quota was recommended (Chapter 2). However, a gender quota per se will not ensure gender-balance in the workshop. If people with a different gender do not feel welcomed to the workshop, they will not attend the event, even if they are invited to it. It can be because of the unfitting timing

or location of the workshop, wording of the invitation, topic of the workshop, and the way of involvement.

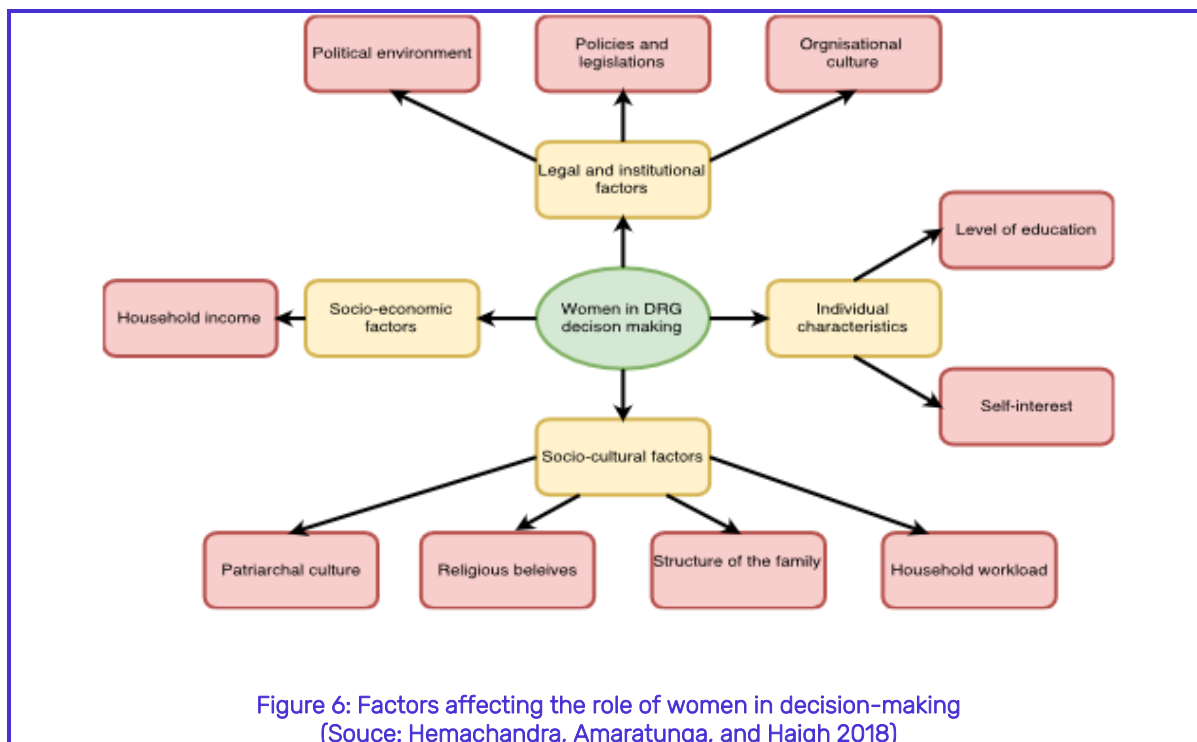
It is important to find a place for the workshop, which is safe and accessible for everyone (e.g., women, people with prams, elderly people, people with disabilities, ethnic minorities). When deciding on the timing, be aware of the factors, which can affect the availability of women and men, for example the household duties of women, religious rest days in the local community, fear of walking home alone at night, etc. It is recommended to provide child-care at the workshop, which can further support the participation of women (Eggerts, 2019).

The invitation to the workshop should encourage the participation of people with different genders. When designing the invitation, consider why the workshop would be relevant for women and men in the local community. For example, due to the socially constructed masculine and feminine range of interests, a focus on technical aspects on the workshop might attract more men, while a focus on social aspects can attract more women⁶.

Common gender-related barriers to decision-making

A study by Hemachandra, Amaratunga and Haigh have reviewed recurring factors limiting the role of women in multi-stakeholder participation in a disaster risk management context (2018). These include intersectional marginalization items, such as household income, level of educatedness, socio-cultural factors asserting collective normative barriers – such as certain religions frowning upon public roles for women – but also individual inertia, which can be the consequence of multiple other factors (Figure 6).

⁶ According to the statistics of the government of Catalonia, in a participatory process on social service and care, the majority of the participants were women. At the same time, in a participatory process on an urban masterplan, the majority of participants were men (Parés Martin *et al.*, 2020).



It should be remembered that neither women nor men are homogenous groups. For instance, different messages can attract a white middle-class elderly woman rather than a young single mother from an ethnic minority. Furthermore, in the case of people with migrant background, language can also set a barrier to participation. A solution could be to design targeted invitation to people with different gender and social characteristics, however, it is important to avoid reproducing gender and other social stereotypes in them.

As mentioned in the stakeholder mapping guideline, the fulfilment of gender quota and the quota for other underprivileged social groups should be evaluated by an anonymous survey. This will moreover be subject to an ex-ante check before a workshop to ensure diversity quotas including for gender have been met. In case of imbalances, corrective measures should be applied to involve the underrepresented social groups.

The solutions mentioned above can support the involvement of people who are uncertain but rather inclined to participate on the workshop. However, there are the so-called “hard-to-reach groups”, who are usually not participating in public discussions and thus whose interest and opinions are rarely considered. It is important to see that these people are not socially homogenous. They could be new residents, young people, elderly people, homeless people, asylum seekers, ethnic groups, sex workers, etc. Furthermore, they are not necessarily hard-to-reach under all circumstances. For their involvement, it is important to understand their characteristics and the reasons why they are hard to engage specifically

in the JUSTNature project, and to find adequate methods of involvement. Involvement methods could be the cooperation with local leaders of hard-to-reach communities, on-street events (festivals, ideation boards, participatory mapping), and snow-ball sampling (i.e. asking already involved participants to involve someone who fits to the criteria described by the workshop facilitators) (Brackertz, 2007; Cinderby, 2010).

CHECKLIST

To comply with the guideline, partners hosting stakeholder engagements are instructed to select venues and organize workshops to eliminate gendered barriers of participation. Partners are to reflect on issues related to accessibility, facilities, timing, compensations, and communication to identify and alleviate these barriers. Use the action items below to report compliance.

- The workshops are held in a place, which is safe and accessible to everyone (e.g., women, people with prams, elderly people, disabled people, ethnic minorities, etc.)
- The workshops are held in a time, which is likely to fit people with different gender and local marginalized social group.
- Childcare is provided at the workshops.
- The invitation to the workshops encourages people with different gender and social background to participate in them.
- A survey is held among the participants to evaluate the fulfilment of gender quota and quota of other marginalized groups.
- Hard-to-reach groups are locally mapped and adequate methods are applied to their involvement.

3.4 On the workshop: Gender-sensitive moderation

As workshop facilitator, create a positive workshop environment, in which all people feel safe and comfortable to share their ideas. Notice, if someone stays silent and apply solutions to engage their ideas too.

It is important to create a positive environment, where people with different genders feel safe and comfortable to actively participate in the discussion. Workshop facilitators – i.e., staff directly interacting with workshops participants, such as event or group moderators, speakers, instructors – should make sure that all participants get roughly the same amount of time to speak. If some people talk more than others, facilitators should thank their contribution and express to the group that they would like to hear everyone's opinion. Moreover, the facilitators should show the participants that they pay attention to them and value their contribution, for example by repeating what they said. It is also important to document each ideas, for example on sticky notes, which can make sure that minority opinions get equal weight (Pugh, 2019).

It is also important to notice if women and other subordinated social groups stay silent. For this, it is useful to register the number of contribution of women and men on the workshop, and how ideas of different genders are handled (Eggerts, 2019). If someone is silent, calling them out might not be wise, because it can cause further stress to them. It is better to ask them individually about their opinion during the break and express that their contribution is also valuable. Additionally, it is wise to allow different ways of participation, for example, large and small group discussion and individual activities (Pugh, 2019).

In topics, where gender matters, it is useful to organize small group discussions according to gender, besides the mixed-gender group discussions, and other activities additional to the workshops, like city walks to map places perceived as dangerous (Cornwall, 2003). Nevertheless, findings of these small group discussions should be shared with the whole group to allow for mutual learning.

It could be the case that gender-discriminatory language and gender stereotyping appears from the side of the participants. It can take the form of jokes masking insults, devaluing the views of women, preoccupation with physical appearance, etc. It is very important not to ignore them and react to them. Silence and inaction express consent to what is said, let discrimination and stereotyping become part of the workshop culture and discourage other people from participation. It could be a solution to reply with a question, for example: "What

makes you think that?" or draw the attention that such attitudes do not comply with the ethical approach of JUSTNature (MCCC, 2017).

CHECKLIST

To comply with the guideline, workshop facilitators dedicate a staff member to moderate discussions, focusing on safeguarding the right to be heard for both women and men. These select facilitators use a variety of techniques to provide appropriate channels for contributions, but also to allow cross-learning and promote empathy. Use the action items below to report compliance.

- The number of contributions made by women and men are registered, as much as possible, and in case of imbalances, corrective measure is made to enhance equal participation.
- Different ways of participation are allowed on the workshop (large group and small group discussion, individual contribution)
- In case of gender-related questions, group discussions and/or programs are organized by gender, and their findings are shared with the large group to allow for mutual learning.
- Facilitators react to gender-discriminatory language use and gender stereotyping of participants and actively counteract them.

3.5 On the workshop: Gender mainstreaming and gender-related solutions

Map the implication of all decisions on people with different gender. Show the workshop participants gender-sensitive technical solutions/alternatives.

Women and men might have different needs to address in the JUSTNature solutions, and the JUSTNature solutions (design of NbS, monitoring framework, decision-support tool, co-governance model) might have different implications to their life. Since women and men know the best what their needs are, it is important to discuss the solutions with them, as gender groups. Based on EIGE's gender mainstreaming framework for policy-development, it is recommended to follow the steps below, in case of each solution (EIGE, 2022b). Note that the different steps might come up in different workshops and are related to the work of different WPs.

1. Define (related to WP2)
 - Define problems, burning questions and needs together with local stakeholders according to gender, and set up goals based on them.
 - Guiding questions:
 - Are there any gender differences or disparities in the CiPeL (with regard to rights, participation/representation, access to and use of resources, exposure to environmental harms that affect gender-specific behavior)?
 - In which ways does the JUSTNature solution affect the everyday lives of women and men in general or specific groups of women and men?
2. Plan (related to WP5 and WP3)
 - Plan specific actions to address gender-related goals defined in the previous step and develop indicators to evaluate them.
 - The gender sensitive urban design portfolio ([Chapter 5](#)) gives inspirations for gender sensitive technical solutions, and some gender sensitive criteria will be included in the criteria matrix.
3. Act (WP5)
 - During the implementation of the JUSTNature solution, communicate transparently with local stakeholders about the progress of the project and the implementation of gender-sensitive solutions, and allow for feedbacks.
4. Check (WP3)
 - Check the progress of the NbS implementation, monitor the fulfilment of gender criteria and indicators, and allow for feedbacks.

CHECKLIST

To comply with the guideline, gender-specific perspectives are to be explicitly explored during workshops if either of the following are included in the workshop content: problem definition, action planning, monitoring planning, implementation. Use the action items below to report compliance.

- Problems, burning questions, needs are mapped on the workshop, according to gender, and goals were set up based on them.
- Specific actions are identified to meet the gender-related goals.
- Indicators are developed and tracked to monitor the implementation of gender-related goals.
- The implementation of the gender-sensitive solutions are communicated transparently to the participants and feedbacks are allowed.
- Gender-sensitive technical solutions are introduced to the participants.

3.6 On the workshop: Gender sensitive language and communication

As workshop facilitator, use an inclusive and gender-sensitive language throughout the workshop, challenge gender stereotypes, make visible all genders, be respectful and avoid subordination.

Language and communication technique can be exclusive, subordinating and can reproduce gender inequalities⁷. Gender-discriminatory language operates with words, expressions, and other linguistic elements, which strengthen gender stereotypes, and make invisible or devalue women or men. As opposed to this, gender-sensitive language means that women and men are addressed through language of equal value, dignity, integrity and respect (EIGE, 2019).

In many languages, there are personal pronouns for each gender (gendered pronouns like he/she). In these languages, it often happens that people use gendered pronouns when they do not know the gender of the person they are talking about (for example referring always to a nurse as 'she'.) Instead, it is recommended to use gender-neutral language ('they') or use gender-sensitive language ('she or he') in case mentioning gender can shed light on key aspects of a topic, like in case of discussing gender sensitive urban design ([Chapter 5](#)). It also occurs that male personal pronouns (e.g. he/him) or the male version of 'human' (e.g. man, mankind) is used to speak about people in general. Similarly, in these cases it is better to stay gender-neutral (they/people/human/humankind) or mention both gender if relevant (woman or man, she or he). Moreover, many languages have gendered words for professions (like chairman, headmaster). Instead of these, it is better to use gender-neutral versions (like chairperson, director) (EIGE, 2019; HLGGED, 2018).

Workshop facilitators should also challenge gender stereotypes⁸. For example, it would be stereotypical and subordinating to assume that women are only interested in the aesthetic aspects of NbS.

In terms of communication, it matters how the facilitators share facilitating roles in the workshop. It often happens that men take the leading role in facilitation (opening the workshop, making a presentation, leading the discussion), while women takes a supportive role (facilitating small group discussion, making notes). Such division of work can not only reproduce gender roles (man: leading, dominant; woman: caring, subordinate), but also it is

⁷ For more on the gender sensitive communication in general within JUSTNature see D9.1.

⁸ Gender stereotypes are generalized images of women and men, which assume that there are characteristics, behaviors, professions, etc., which are inherently related to being a woman or a man (EIGE, 2019).

more likely to create a masculine environment, where women feel less comfortable to participate actively in the discussion. Facilitator women and men during preparations should align on their roles and allocate speaking time equally among each other, as well as ensure equity in speaking time for male and female participants (see below).

In case of using images, it is important to challenge gender stereotypes (woman in leading position, man walking with pram), and which reflect the diversity of people (people with disabilities, people of color, elderly people, etc.).

CHECKLIST

To comply with the guideline, workshop facilitators are instructed to raise awareness of participants to gender-based discriminations. Rather than being neutral agents, they should demonstrate gender-inclusive discourse and challenge stereotypes. Use the action items below to report compliance.

- Inclusive and gender sensitive (or gender-neutral language, when adequate) is used during the workshop.
- Workshop facilitators challenge gender stereotypes.
- Facilitating roles and time is shared equally between the workshop facilitators.
- Images, used in the workshop, challenge gender stereotypes, and reflect the diversity of people.

3.7 After the workshop: Evaluate participatory data and draw a lesson from them

Evaluate the demographic data, and number of contributions by gender. Learn from the detected imbalances and adjust the organization of the workshop, if needed.

After the workshop, it is important to evaluate, whether the workshop could meet with the aim of this guideline and the equitable participation of people with different gender and social background could be ensured (Eggerts, 2019).

First, the checklist of this guideline should be filled out by the facilitators. It helps understand the context of potential imbalances in participation. Furthermore, it will be used for the report on the implementation of the gender empowerment strategy.

Secondly, demographic data (about gender and other social characteristics), collected by the anonymous surveys should be evaluated and compared with the local statistical data⁹, by gender. It should be also checked, whether social groups, who are present in the neighborhood, but are invisible in the demographics (for example ethnic minorities) were present or not. In the case of underrepresented social groups, define and implement solutions for a more successful engagement.

Furthermore, the number of contributions made by women and men should be analyzed, and it should also be evaluated how the contributions of different genders were handled. In case imbalances are detected in participation, it should be discussed what the reasons could be behind it.

Finally, unequal access to participation (participation gap) should also be viewed with a full-process perspective, as there are multiple opportunities throughout the “lifecycle” of the participatory process, where different barriers for women appear. It is recommended to take a user experience approach to reflect on this, which, in general, means to systematically measure churn and diagnose their reasons for key stakeholder groups (Marcus, 2013). For this, a detailed guideline will be developed as part of T7.3 and support will be provided by ABUD for the implementation, but the main steps are also outlined here. In the context of gender mainstreaming, this can be translated to the following steps. First, personas¹⁰ should be constructed that describe the motivations, goals, basic characteristics of a group of

⁹ Local statistical data, disaggregated by gender, has already been collected in each CiPeL.

¹⁰ In the context of this study, the term “persona” refers to a fictional archetype or composite representation of users, constructed based on empirical data and qualitative research, aiming to capture and communicate key user characteristics, needs, and behaviors in the field of user experience research (Humphrey, 2017).

interest, which should cover both genders and relevant marginalized groups in their intersection. Second, user journey maps – step by step description of the participation process from the perspective of a persona – should be constructed, identifying the key actions which are important for successful participation and legitimate outcomes. Then, the churn rate¹¹ at each action should be measured. Finally, where churn is significantly different for the personas, the reasons behind this should be explored using follow-up interviews. Both the construction of personas and user journey maps should be CiPeL-specific, but this guideline provides a baseline list that can be adjusted with local stakeholders (Table 2).

The results of evaluation should be discussed as part of the CiPeL meeting after each local workshops. It should be a platform to share good and bad experiences of city partners and ask for the supervision of ABUD.

Table 2: Baseline user journey for workshops

User journey: key activities	Possible gendered failure scenario
Expression of issues to discuss	Lack of channel for feedback
Proposing an initiative	Lack of ideation fora
Accessing proposed issues and initiatives	Ideation forum obscure, difficult to find
Selecting issues of relevance/being recognized of relevance	Presentation of issues confusing
Joining/being invited to a discussion	Only households are invited, not individuals
Participating in deliberation	Deliberation at inconvenient times
In deliberation: voicing opinion	Dominant voices suppress opportunity
In deliberation: judging other opinions	No teamwork programmed
In deliberation: contesting other positions	No room for feedback
In deliberation: accessing supplementary information	Insufficient time to read background material
In deliberation: assessing personal impact	No relevant impact assessment
In deliberation: making informed decision	Overload of information
In deliberation: influencing the outcome	Powerful actors manipulate the process
In deliberation: contesting/amending the outcome	Decisions are final
Understanding and accepting the reasons for a negative outcome	Lack of transparency
Understanding who loses what for a positive outcome	Lack of reflection

¹¹ The ratio of participants who are no longer engaged at a milestone to the number of participants engaged before the milestone. For example, 50 people received invitation to a co-design workshop, and 45 show up, would translate into a churn rate of $(50-45)/50 = 10\%$.

CHECKLIST

To comply with the guideline, workshop facilitators are instructed to reflect on gender discrimination, power asymmetries, differences and failures experienced in the quality of participation by gender. Use the action items below to report compliance.

- Demographic data is analysed by gender and compared with the social composition in the neighbourhood. Potential imbalances are detected, and corrective measures are defined for the next workshop.
- Number of contributions made by people with different gender and of social group are analysed. Potential imbalances are detected, and corrective measures are defined for the next workshop.
- Participation gap is analysed on the entire user journeys of different gendered personas.
- Gender-disaggregated feedback is collected from the participants on the gender-sensitive organization and facilitation of the workshop.

4 GENDER GUIDELINE FOR MONITORING AND DIGITAL TECHNOLOGIES

Relating task	Recipient
Task 3.1 Evolving indicator framework to an integrated life-cycle approach (M10-M24)	TUC, EURAC, ABUD, RWI, TUM, UM, E2ARC, PI, OBSNAT, ISOCARP
Task 3.3 Developing decision-support tools taking into account the wider life-cycle costs and benefits of Low carbon High air quality NbS interventions (M14-M54)	ABUD, EURAC, TUM, INLE
Task 6.2 Digital twin developments for NbS impact modelling and visualisation (M15-M36)	IES, EURAC, TUC, ABUD
Task 6.3 Development of governance platform for NbS operation based on DLT (M18-M43)	ABUD, EURAC

4.1 Description of work

A core tenet of JUSTNature is empowerment through digitalization. “Technology and applications” is one of the four innovation dimensions of the project, which role will be to accompany the entire NbS lifecycle, providing dynamic, rapid data and knowledge on the multidimensional performances of each intervention and their distributional aspects. More specifically, the expected technologies and digital solutions to be demonstrated include causal performance networks, distributional KPI (key performance indicator), multiscale/multichannel data collection, evolving digital twins, strategic and operational decision support systems, stakeholder-specific analytics, and smart contracts. It is expected that such development facilitates social innovations, such as NbS prosumership, ecosystem service markets, nature-building communities, and co-governed natural resources. All of these firmly bring closer the control of NbS assets to local stakeholders, with a promise of democratization, increased agency, and equal participation in green infrastructure development – in short: digital empowerment.

Digital empowerment is not a straightforward process. To appropriately address the intricacies in the entanglement of social and technological systems, one must employ a perspective that is informed on both sides. The critical appraisal of this intersection is a focal point for science and technology studies (STS), which asserts that technology is not shaped by purely rational, technical designs, but also by social practices, behavior, and cultural sensemaking. At the same time, technological developments shape and configure social

relations (Suchman, 2007). This constructivist line of thought is adopted by the technofeminist discourse, which emphasizes the same dialectical relationship between gender relations and technology (Wajcman, 2010). In other words, both the ways by which preexisting power relations are reflected in technology and the ways by which technology can reproduce or disrupt patriarchal power relations (Wajcman, 2004).

The aim of this guideline is to support developer tasks with methods to critically reflect on gender relations in the context of digital technologies and to ensure that a digital gender empowerment occurs as a result of JUSTNature. As most conceptual design decisions in JUSTNature technologies are made in WP3, it is the main domain of application, but the recommendations will also be relevant for some of the tasks of WP6. Therefore, it is the responsibility of task leaders in these WPs to transpose these recommendations to their workflow, namely: TUC, IES, and ABUD. The remainder of this section is structured to reflect the key challenges of gender-sensitive technological development:

- [Section 4.2.1](#) introduces the gendered aspects of the digital divide and how to avoid it.
- [Section 4.2.2](#) provides guidance on understanding the role of technology in (re)producing gender relations.
- [Section 4.2.3](#) explains how to avoid depoliticization of technological development.
- [Section 4.3](#) focuses on the justice aspects of monitoring and indicator development.
- [Section 4.4.1](#) discusses the scope of a gender-inclusive governance of A.I. (artificial intelligence)
- [Section 4.4.2](#) focuses on gender biases in decision-support systems.

The full checklist of the guideline can be found in [Appendix 7.4](#).

4.2 Ensuring digital empowerment

4.2.1 Bridging digital divides

Mixing and equally representing gendered roles of ICT use and non-digital alternatives should be integrated to user experience design.

Digital empowerment is a focal point of JUSTNature. The role of data-driven strategic decision support, and monitoring is to provide the knowledge necessary for self-advocacy. Digital twins are proposed to improve the accessibility of such data and extend its relevance throughout the NbS lifecycle. Smart contracts will be prototyped to automate transactions,

task and resource allocation, and the execution of policies, in effect disintermediating and socially upscaling nature-building communities. What is common in these technologies – and what gives them the potential for empowerment – is that they have a purpose that is not (only) the improvement of any productive tasks, nor the enhancement of markets, but rather the coordination of activities and the facilitation of new pathways for autonomous agents to participate in collective decision-making and resource management. In other words, they are not only production or market technologies, but they are also institutional technologies (Davidson *et al.*, 2018). This is not to say that JUSTNature technologies do not have productive roles and these roles are not empowering, but an institutional technology lens means a higher level of complexity and assessing them from such perspective will give a more comprehensive picture of how they can fail and succeed in empowerment. More specifically, this lens reveals three main considerations that could make the difference between empowerment and disempowerment:

- gender digital divide, i.e. the gap or inequalities between women and men regarding their access to and use of digital technologies;
- gender-transformative technologies, i.e. interventions that create opportunities to challenge gender norms and empower women;
- politicization of technology, i.e. shedding light on the nature of technology, which hides and cements unequal power relations, and setting up democratic standards for the design and operation of digital technologies.

The first issue to consider is whether digital divide is "a phenomenon of social disintegration that derives from the unequal ownership and distribution of information and communication technology and the unequal access to information and communication sources on the Internet" (Arnhold, 2003). Whereas digital divide, as a pure, skill-driven accessibility problem is more of an intersectional age and gender than a purely gender issue, there are differences in terms of digital culture and in the utilization of ICT (Information and Communications Technology) (Buchmüller *et al.*, 2011). In the European context, studies have shown that women tend to use ICT to aid in their role as caregivers, focusing on maintaining relations, valuing availability, while men are more versed in ICT entertainment, focusing on uses linked to ICT as a utility often in rich professional contexts (Buchmüller *et al.*, 2011).

This suggests two ways in which digital divides can manifest: (1) a hard divide that reduces accessibility of technology, and (2) a soft divide that foregrounds certain uses of technology over others. The hard divide is more connected to age, whereas the soft divide has roots in gender roles. To prevent discrimination, it is recommended that any tool for digital

empowerment has a non-digital "workaround", meaning that a channel for participation should be developed for the same affordance as offered by the tool. For example, an online platform to propose projects for a citizen budget could be accompanied by a citizen's desk to do the same offline. To do so, each affordance offered by the digital portfolio of JUSTNature in the CiPeLs should be mapped, their accessibility tested, and alternative, more accessible instruments for the same affordance proposed.

What could be the affordances of a digital portfolio?

Project SmartCEPS includes a methodology for integrated, computational urban planning. The prescribed planning process includes an appraisal of digital interventions, for which a list of potential solution-urban performance interactions is provided. This can serve as a reference for mapping what exactly a digital solution in JUSTNature accomplishes, for which a non-digital workaround is to be designed. Not all items in the list are affordances, meaning not all interact with someone's goal-oriented actions, and thus their non-digital alternatives are not needed from a digital divide perspective:

- Data generation: solutions that produce raw data, such as water quality sensors
- Data integration: solutions providing an infrastructure for processing and storage, such as cloud services
- Data security: solutions expanding potential use-cases for other interventions by enhancing protection against random failures and deliberate attacks, such as access control
- Knowledge generation: solutions combining, analyzing data, returning outputs for direct use, such as traffic density forecasting
- Transparency: solutions making data and knowledge accessible, such as dashboards
- Capacity & awareness: solutions that enable stakeholders to be more active and able decisionmakers, such as hackathons
- Responsibility sharing: solutions facilitating interactions in decision-making processes, such as open government
- Solidarity: solutions that improve the distribution of benefits of other actions, such as smart contracts
- Substitution & optimization: solutions leveraging previously unused knowledge in existing services to reduce, replace tasks, such as autonomous freight vehicles
- Synergy: solutions leveraging previously unused knowledge in existing services to give added value to tasks, such as crowdsourced datamining

- Actuation: solutions which directly interact within the environment they operate in, such as responsive streetlights

In case of the soft divide, it is recommended to consider and mix conventionally masculine and feminine roles of ICT utilization when constructing personas for the usability of various tools. It is expected that certain ICT-enhanced tasks in the NbS lifecycle would suit more of a caretaker, network-curating role (e.g. NbS operation, division of work, conflict management, resource allocation), while others would be better fulfilled by a more utility-driven role (e.g. NbS service design, technical problem solving, maintenance). This is not to say that one role should be restricted to any gender or gender identity. Rather, we recommend an equal representation and valuation of both roles in the NbS lifecycle, the construction of roles that mix the two traits, and the design of digital tools supporting both. This will work to encourage taking up roles associated with the opposite sex, mitigate differential utilization of ICT and the differential access to digitally-aided NbS design and management.

CHECKLIST

To comply with the guideline, developers of digital tools with a user interface are instructed to commit to gender-aware design of the tools and their interactions with users. Use the action items below to report compliance.

- Each affordance offered by the digital portfolio of JUSTNature in the CiPeLs is mapped, their accessibility tested according to gender, their implication to women and men evaluated.
- Alternative, more accessible and equitable instruments for the same affordance are proposed, where needed.
- Gender-based roles are codified in personas when assessing user experience, and for any represented woman and man locally valued use-cases are provided throughout the NbS lifecycle to (1) equally represent both roles and (2) uptakes roles that mixes both traits.

4.2.2 Gender-transformative technologies

The gender-transformative and disempowering capacities of technological affordances should be evaluated, in the context of existing gender relations and ongoing social trends to change them.

Apart from planning for digital divide, it is also recommended to reflect on whether and how a given technological solution relates to challenging gender relations (gender transformative technologies). Technological development not being gender-neutral is a main argument of technofeminism and having a basic understanding of how technology has been expected to interact with gender relations gives a solid ground to do such reflection. This interaction can be captured by the duality of a masculine interpretation of the industrial revolution, pitted against a feminine expectation for the digital revolution. Historically, the technofeminist discourse has seen the industrial revolution as sociotechnical transformation mainly driven by a white male engineer middle class, which resulted in the absorption of technical skills into masculine identity (Wajcman, 1991), an overall imbalance in workforce gender composition (Felstead *et al.*, 2007), and a masculinization of working culture (regardless of gender), which have harmful effect on both women and men. On the side, the proliferation of network technologies has sparked a wave of positive discourse in the relationship between women and technology, arguing that a masculine industrial revolution could be followed by a feminine digital revolution (Castells, 2011). While not succumbing to uncritical techno-optimism, it is necessary to understand and consider how cyberfeminism and STS accompanying the introduction of network technologies imagined the empowerment of women through digitalization to reflect whether our solutions fulfil on that promise:

- Digital technologies offer virtual spaces of interaction, which disembody interpersonal communication, not only potentially removing prejudices, but also giving freedom to assume any temporary role or identity with much higher flexibility than in physical spaces (Millar, 2000).
- Through the advent of a networked society, some advantages associated with femininity increase in value, such as networking, while some masculine traits, such as physical domination are devalued (Plant, 1997).
- As technology increasingly pervades the boundaries of humanity itself - in particular with biotechnology - traditional, biologically-driven gender roles are being challenged and blurred, since we grow in our capability to alter our biological limitations (like the ability to carry weights) and liberate ourselves from a biologically-driven path dependency (Haraway, 1997).

These empowerment aspects – disembodiment of communication, valuation of feminine traits, challenging gender roles – should be reflected on during the design stages to identify synergistic tendencies between social and technical aspects of transforming gender

relations. Naturally, there are more ways in which a technological product can empower marginalized people, and it is also recommended to collect all affordances with a transformative potential. However, this listing should be critically reflected upon in their contexts of use, as they can only be fulfilled if coupled to a corresponding social intent. For example, disembodiment of communication in virtual space could adversely disempower women by providing new channels of harassment (Bardzell, 2006). To pave the way for gender transformative technologies, the affordances with gender empowerment potential should be itemized together with a corresponding social intent or movement and reflected on with the perspective of adverse use cases.

Conversely, technological choices could also cement preexisting injustices through investing in tools and infrastructure supporting social practices of harmful gender relations. The design of artefacts and the environment have a stabilizing effect on social norms, partly through symbolizing them, partly through foregrounding or forcing the repetition of certain social practices over the others (Latour, 1990). Gender relations can manifest in technology while technology can recreate gender relations (Wajcman, 2004). Failure to consult gender interests and allowing them to shape technological choices have empirically proven to be accentuating marginalizing tendencies for a variety of artefacts, such as: everything from the microwave oven (Cockburn & Ormrod, 1993), the telephone (Martin, 1991) and the contraceptive pill (Oudshoorn *et al.*, 2004) to robotics and software agents (Suchman, 2007). However, it would be incorrect to fall into the trap of determinism, saying that a technological choice or a design choice causes certain gender relations to manifest. Technologies should be assessed through the dual lenses of their affordances, i.e. the ways their inherent capabilities and designs facilitate or hinder goal-oriented actions of certain people in certain contexts (Volkoff & Strong, 2013), and the agency of the user, who interprets these affordances, and develops their own practices based a cultural and personal appropriation of both the technology and the social norms perceived in its use (Haddon, 2004). To operationalize these points, the recommendation is still the same, that is reflect on the ways JUSTNature technological solutions interact with changing gender relations. However, such exercise should extend to conserving gender relations as well, and it should also consider that such interaction is rooted both in the technology (affordances) and in their use (agency). Thus, such exercise is not (just) internal feedback, but something to be brought to CiPeLs, most organically fitting into a broader test of usability.

CHECKLIST

To comply with the guideline, developers of digital tools are instructed to actively design these tools to enable gender mainstreaming, whilst being aware of the gender-transformative potential of their interventions. Opportunities to empower marginalized social groups are to be sought after and, if feasible, taken. Use the action items below to report compliance.

- During usability testing, all affordances with a gender-transformative potential are itemized.
- Gender-transformative affordances are evaluated based on their linkages to existing, gender-transformative social trends in each CiPeL.
- Gender-transformative affordances are assessed for potential adverse impacts on gender discrimination and violence.

4.2.3 Politicized data governance

All technological design choices should be subjected to democratic standards of legitimacy, accountability, transparency, and contestability for all genders.

The final point to make in this section is the rational consequence of accepting the emancipatory potential of technologies, that technology is inherently political. There is a tendency towards managerialism in multiple applied fields that seeks to recontextualize social issues as operational problem solving, rather than a deliberative process, i.e., an exchange between conflicting actors to come to a consensus (Sørensen & Torfing, 2005). This is especially the case for digital technologies, where any problem and solution are being abstracted for computability, which is an opportunity to depoliticize them, i.e., to hide the political nature of technology (Kadir, 2021). It means that similar to technological design choices, abstraction itself can potentially hide and cement existing inequities, institutionalize them, and perpetuate the disadvantages of marginalized communities (Selbst *et al.*, 2019). Furthermore, designers and researchers have their own biases and prejudices, which lead to the (unconscious) prioritization of certain actors and networks over others (Harding, 1986).

Since technology development is inherently political, it should be treated as such, meaning that the design and operation of technologies should follow democratic standards of legitimacy, accountability (Wagner, 2020), plurality (Mouffe, 1999), and contestability (Pettit, 1999). There are two aspects of fulfilling these standards, one concerned with design, the

other with the operation of institutional technologies. For design, an iterative participatory design process should ensure the legitimacy of the systems and solutions in place. Recommendations for participatory design are detailed in [Chapter 3](#) on gender sensitive workshop facilitation. For system operation, general, procedural requirements can be prescribed, which, if fulfilled, will also ensure a fair representation and opportunities of disadvantaged genders.

Democratic standards first and foremost apply to the representation of people and groups of people – especially gender groups – within systems. Mechanisms must be provided for individuals and gender groups to assess their identification with any of their representations, and they should be able to criticize and even recall these representations with reasonable effort (Sørensen & Torfing, 2005). This means a rejection of the finality of abstractions (the way we describe things with data) and the rationality of optimization (the solutions we recommend through the analysis of data). Constitutive pluralism states that there is no universal good, neither universally good representation (Laclau & Mouffe, 1985). Therefore, both the data content and the logic of decision-support systems should be subjected to democratic oversight, which translates to some digital functionality that must be provided.

CHECKLIST

To comply with the guideline, developers of digital twins and decision-support tools are instructed to provide pathways for represented women and men to review, contest, control, and recall the way they are represented on the ground of fidelity. Use the action items below to report compliance.

- In digital twins, and decision-support tools, any represented woman and man, and social group can observe how they, their interests, and their perspectives are abstracted.
- In digital twins, and decision-support tools, any represented woman and man, and social group can formally express their opinions on it and has opportunities to calibrate this abstraction.
- In digital twins, and decision-support tools, any represented woman and man, and social group can recall their abstract representation.

4.3 The justice of monitoring

Gender risk assessments and a context-sensitive gender-disaggregated data collection regime should be in place to fully understand differential vulnerabilities of gender.

This section focuses on indicators and how to collect data for diagnosis and monitoring. The main principle to follow here is providing ample understanding on the differential vulnerabilities of various social groups in any gendered intersection, i.e., elderly women. Differential vulnerability is not a stable attribute of a group, but a dynamic result of the combination of risks (e.g. deterioration of air quality, heat island effect) and multiple social variables (e.g. age, gender) which may accentuate the risk or its impact (Thomas *et al.*, 2019). For instance, climate change is expected to increase flood risks and temperatures in urban cores that result in damages in property and increased heat stress (Douglas *et al.*, 2008; Harlan *et al.*, 2006). As the former hits at wealth, it is aggravated for people living in poverty, while the latter – a medical issue – is more damaging to those who have less access to adequate healthcare. Furthermore, multiple risks may intersect, such as security and poverty (Davies *et al.*, 2020), and existing social vulnerabilities further decrease coping capabilities, such as exclusion from land tenure (Satterthwaite, 2007).

The bare minimum step to expose gender inequalities and differential vulnerabilities is disaggregated data collection. Such disaggregation should acknowledge that gender and multiple social variables play a role in the influencing of vulnerabilities, which is why performance distribution should be measured for all of them (for the list of social variables, please refer to [section 2.4](#)). Disaggregated data collection can easily be processed into automated signaling systems for injustices. For example, in the syn.ikia project on energy-flexible districts, the performance monitoring framework prescribes the conduct of a performance distribution audit, where for an indicator of interest it is tested, whether being member of a vulnerable social group correlates with certain level of performance, using one-way analysis of variance, or ANOVA (Salom *et al.*, 2021). The same framework also defines vulnerable social groups along multiple variables, and a single control group to conduct the ANOVA. It is not prescribed to follow this exact method, but it is recommended that a signaling tool is developed to automatically detect differential performances, relying on disaggregated data collection, in all relevant intersections of social vulnerabilities (which are mapped out during stakeholder mapping, see [Chapter 2](#)).

Disaggregated data collection is a necessary but not a sufficient condition for gender mainstreaming. Disaggregated data collection *per se* does not address unequal power relations between women and men, and the true purpose of indicator development should be increasing the capacities they give for women and men to act on eliminating inequalities (Schalatek & Granat, 2015). To do so, CiPeL-specific indicators are recommended to be developed based on gender risk assessments. These assessments – done by a collaboration of WP2, WP3 members and CiPeL stakeholders – should be identifying known gender-specific risks and failure scenarios, which can empower self-advocacy and advocacy through political pressure groups. These risks can then be reformulated as indicator objectives and – if prescribed for measurement – they could pave the way for normative regulations based on performance standards (Figure 7).

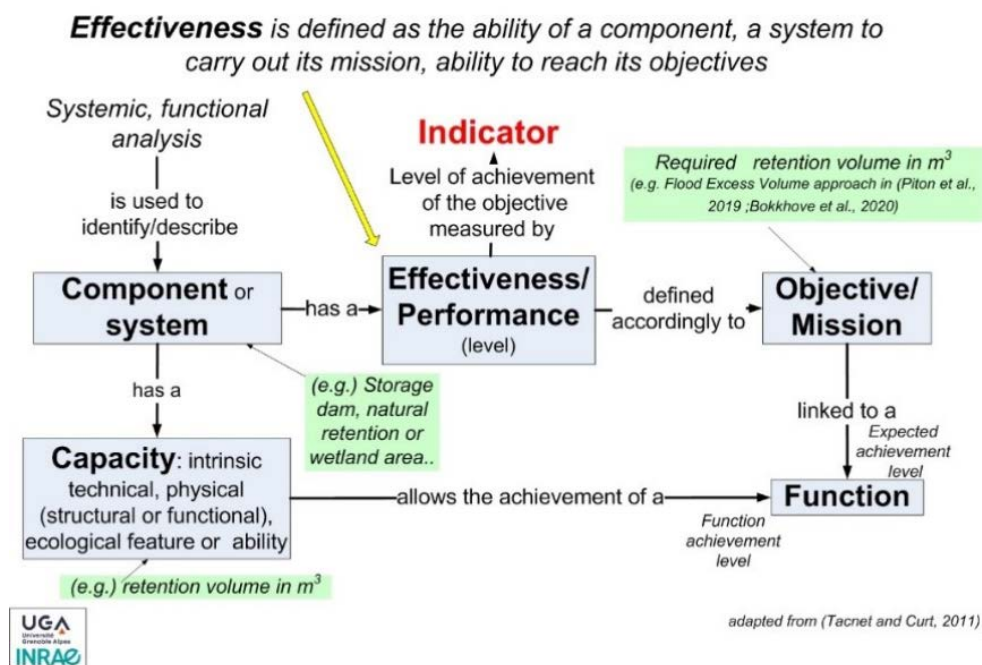


Figure 7: The connection between gender risk assessments and indicator development (Source: NAIAD 2019)

These failure scenarios are expected to be heavily context-dependent, which is why it is recommended to develop gender risk assessments in each CiPeL, consulting both the stakeholders engaged with the protection of women, men, boys, and girls and layperson representatives of the social groups themselves. However, it is possible that these consultations will have blind spots. Therefore, there is no bullet-proof countermeasure, but three actions can be prescribed:

- repetition of the risk assessment to consider changing perspectives and learned capabilities to articulate injustices,
- a sharing and critical reflection on risk assessment results among the cities to uncover injustices obscured by local culture, and
- the reflection on risks already observed and compiled by research or international agencies, which should be included in the literature review of T3.1.

What is expected from this exercise is that it will produce clearly defined, locally relevant, peer-validated gender-related objectives and areas of performance which can be taken as an instruction to develop KPIs (T3.1) and alert systems (T3.3). It is recommended that a pre-assessment based on related literature, the knowledgebase developed in WP2, and frameworks of previous international projects precede collaborative work with CiPeL stakeholders.

In the remainder of this section, we present a few references to support the buildup of this pre-assessment. There are recurring subjects in the literature that should be explored. These are exemplified in the following references, starting with the gendered violence linked to environmental risks.

Environmental risks and gender violence

The International Union for Conservation of Nature, (IUCN) has published an extensive study on the environmental linkages of gender-based violence, abuses, discrimination, probing over 1000 data sources and subsequently validating its findings with 300 strong survey and 80 case studies (Castañeda Carney *et al.*, 2020). While the scope is global, it does give an initial idea of the specific abuses monitoring should capture, relating to accessibility of natural resources, environmental hazards, and conservation efforts. The key risks that can be derived from this study are listed below. Natural resources accessibility risks:

- reduced access to land, forests, agri- and aquacultural resources due to culturally assigned or legally mandated gender roles
- differential access to specific natural resources
- reduced ability to exploit natural resources and ecosystem services due to economic dependency and control by intimate partner
- increased risk of sexual violence when accessing environmental goods or performing tasks connected to common pool resources

<ul style="list-style-type: none"> ▪ threat of the commodification of sex in loosely regulated transactions or in asymmetric power situations <p>Environmental hazards:</p> <ul style="list-style-type: none"> ▪ exploitative behavior in the event of resource scarcity ▪ differential disruption of daily lives and access to livelihood by environmental degradation and climate hazards ▪ increased exposure to environmental hazards due to gender roles, customs, or regulations <p>Conservation efforts and environmental action:</p> <ul style="list-style-type: none"> ▪ lack of channels to voice concerns, opinions, initiatives ▪ lack of opportunities and resources to participate in deliberation and action ▪ gated roles in environmental protection efforts ▪ intimidation against certain gender-role, gender-action associations
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One of the major areas of gender violence is public space, which is often the host of NbS. Undoubtedly, poor management and design choices can result in the proliferation of gender violence, in the form of intimidation, threats, harassment, and outright attacks involving physical violence. At the same time, even if actual cases of gender violence are non-existent or sufficiently low, public spaces perceived as unsafe will discourage women from going there, resulting in reduced access to the benefits of the NbS, a limitation to mobility, and a restriction of participating in active, healthy outdoor activities. The UN-Habitat recommends the use of women safety audits to properly address aspects of perceived and real safety of public spaces with an intersectional approach covering age, employment status, educational status, marital status, disabilities and sexual and gender minorities (Aurat Foundation, 2020). It is recommended to check with each CiPeL whether such study exists. If not, it is recommended to do co-mapping, or night walks in the neighborhood of the CiPels according to gender, to analyze areas which are perceived as unsafe. At the same time, the dimensions covered in UN-funded audits make for a useful starting point for indicator development (Table 3).

Table 3: UN women safety audit data points

Perceived safety	<ul style="list-style-type: none"> ▪ an overall feeling of security ▪ quality of lighting ▪ quality of maintenance ▪ optimal presence of others: crowdedness/desertedness
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	<ul style="list-style-type: none"> ▪ surveillance ▪ composition of others ▪ presence/absence of women facilities
Actual safety	<p>The frequency and spatial distribution of incursions in categories of:</p> <ul style="list-style-type: none"> ▪ non-verbal aggression: staring, gesturing, flashing, photos ▪ verbal aggressions: comments, remarks, whistling, shouting ▪ physical violence: blocking, stalking, pushing, attacks, kidnapping, inappropriate touching, pinching, assault, others
Responses to violence	<ul style="list-style-type: none"> ▪ ignoring, retreating ▪ on-site reactions: stopping, verbal response, physical response, calling for help ▪ reporting: to police, dedicated helplines ▪ informing friends or family

CHECKLIST

To comply with the guideline, partners engaged in buildup of site-specific knowledgebase must cooperate with partners engaged in monitoring. The monitoring framework must be designed to be able to report on gender risks relevant to each site, meaning these risks are to be identified case-by-case. Use the action items below to report compliance.

- Gender risk pre-assessment is compiled from WP2 knowledgebase, scientific literature, and recommendations of trusted major international organizations
- Gender risk assessment is conducted with CiPeL stakeholders, resulting in a set of objectives for indicator development
- Impact data is collected in a gender-disaggregated way, and for all social variables listed in [section 2.4](#)
- Spatial distribution of people of certain social variables listed in [section 2.4](#) is available

4.4 Gender-sensitive decision-support

4.4.1 Gender-inclusive governance of A.I.

The democratic oversight of decision-support systems should be provided for an A.I. trust, in which the voices of all genders are adequately heard, and where their interests can be asserted.

The proliferation of decision-support systems marks an increased weight of knowledges and evidence in decision-making. As stated in [section 4.2](#), this could either empower marginalized actors in the deliberative process or could also exacerbate their lack of voice in technocratic, depoliticized systems. This section focuses on the misappropriation of knowledges in analytics solutions from a gender perspective, with the goal of offering preventive measures to gender-specific adverse outcomes.

Broadly speaking, these adverse outcomes most commonly include encroachment of privacy through surveillance (Feldstein, 2019), the manipulation of public opinion (Reed, 2018), biases and discrimination in the analytics pipeline (Weyerer & Langer, 2020), and the import of power inequalities to the treatment of knowledges (Fricker, 2013). The issue of surveillance is not in scope of this guideline, as it falls under the purview of data protection planning. The remainder of this section is structured along the following three adverse outcomes:

- Information governance measures centered around the concept of normative indeterminacy are prescribed to prevent misinformation and manipulation.
- Causes and countermeasures for gender bias and discrimination are introduced.
- A procedural epistemic justice lens is applied to guide knowledge brokerage.

The first adverse outcome, misinformation, or manipulation refers to wicked problems in information governance. We argue that this is closely tied to the removal or obfuscation of humans from decision-making. The more decisions are results of a computation, the more it becomes important whether or not machines can learn and incorporate social norms and human values (Pask, 1976). Arguably, sociotechnical systems are viewed from a multitude of perspectives, based on different models of reality and pluralistic values, and without a clear consensus. It suggests that – at least for the time being – an uncertainty with regards to norms and values will persist in computational decision-making. This uncertainty – called normative indeterminacy – outlines specific areas where human (community) intervention is necessary (Dobbe *et al.*, 2021). These distinct indeterminacies are the entry points for voices of subordinated groups, like women, and to make sure that their interests are present

in the decision-support systems. The specific indeterminacies are discussed below, and an overview table provides a set of guiding questions for the system designers (Table 4). The main recommendation for all indeterminacies is that stakeholders should form an A.I. trust with a broad scope outlined below, and with a general purpose of providing democratic oversight. The representation of different genders, and other marginalized groups in their intersection should be ensured in this trust.

Table 4: System designers are encouraged to reflect on each of the following questions to comprehensively cover all normative indeterminacies. The guiding questions are adopted without editing from Dobbe (2021).

Inclusion	<ul style="list-style-type: none"> ▪ What kind of stakeholders are directly involved or indirectly affected by issues and solution directions considered? ▪ How is power and agency assigned along the process of development and integration? ▪ How are the boundaries of the AI system and its implications determined?
Resolution	<ul style="list-style-type: none"> ▪ What deliverables or outcomes are expected or envisioned for the project? ▪ What variables and criteria are needed to measure these outcomes? ▪ What ethical principles and decision-making process is needed to achieve resolution across different stakeholders? ▪ What conditions will allow both supportive and dissenting groups to express their concerns and contribute meaningfully to the development and integration of a resulting system?
Underfeaturization	<ul style="list-style-type: none"> ▪ What possible input variables or model parameterizations do we choose not to include? ▪ What features will the model not be able to learn that may in fact be open to normative deliberation?
Misfeaturization	<ul style="list-style-type: none"> ▪ What environmental features or actions do we choose to parameterize, and with what complexity? ▪ What forms of dissent will be foreclosed by elements of computation, and for whom would this matter?
Verification	<ul style="list-style-type: none"> ▪ Does the system meet its specifications (was the right system built)?

	<ul style="list-style-type: none"> ▪ Are the needs of prospective users being met? Is the system able to predict or determine what it was meant to?
Validation	<ul style="list-style-type: none"> ▪ How does the system perform in its empirical context (was the system built right)? ▪ Does the system behave safely and reliably in interaction with other systems, human operators and other human agents? ▪ Is there risk of strategic behavior, manipulation, or unwarranted surveillance? ▪ Are there emergent biases, overlooked specifications, or other externalities?
Exit	<ul style="list-style-type: none"> ▪ Are stakeholders able to withdraw fully from using or participating in the system? Is there any risk in doing so? ▪ Are there competing products, platforms or systems they can use? ▪ Have assurances been given about user data, optimization, and certification after someone withdraws?
Voice	<ul style="list-style-type: none"> ▪ Can stakeholders articulate proposals in a way that makes certain concerns a matter of public interest? ▪ Are clear proposal channels provided for stakeholders, and are they given the opportunity to contribute regularly? ▪ Are the proposals highlighted frequently considered and tested, e.g. through system safety? Are stakeholders kept informed and regularly updated?

The first indeterminacy is the inclusion-resolution dilemma, which, articulates a trade-off between delegation of powers to more people and the feasibility of the decision-making process. Formally, the dilemma states how could multiple perspectives be included, and decision-making power decentralized without compromising the process and expectations for the resolution process (Dobbe *et al.*, 2021). Accessing gendered perspectives and providing women and men equal decision-making power is necessary to build trust and ensure gender equality and the legitimacy of decisions. Nevertheless, there may not be sufficient information, time, or other resources to maintain a deliberative process with sufficient democratic standards – meaning inclusion has a scalability issue. The inclusion of the perspectives of women and men in the decision-support logic should be ensured by

system designers, while keeping the deliberative process feasible. This pertains to providing channels for these stakeholders to actively shape the system (Unger, 1983), escaping the mindset that they are passive information sources to be mined (Irani *et al.*, 2010). It must be noted that not all normative aspects are apparent from the get-go, which is why it is important to keep up these channels and provide pathways for contestation (Dobbe *et al.*, 2021), which should be equally accessible for all genders (see [section 3.3](#) for common gendered inaccessibility issues).

The featurization dilemma is partly addressed in the previous section on monitoring, as it reflects how certain abstractions of a strategic problem may lose information on certain interests. It must be noted here that further processing and new abstractions do occur between monitoring and specific decision-support applications, defining fit-for-purpose features and new opportunities for information loss. This loss is inherent to the logic of the DSS (decision-support system) itself, as it defines modelling constraints, and limits the options of any stakeholder to assert their interest (Dobbe *et al.*, 2018). The way to address this is to (1) explicitly formulate the things that can and cannot be featurized, (2) collect stakeholder expectations for a specific analytic task prior featurization, and (3) validate the final features and constraints. In this last step, there should be an active, collaborative effort to map out, in the operational context of the DSS, any accidental or deliberate failure scenarios which would affect women and men, as well as other social groups. Safeguards should be designed, and solutions that fail at validation should be discarded, even if technically the system would work (Baumer & Silberman, 2011).

Beyond the features, there are several computational objects in DSS where stakeholder values can be represented, namely hyperparameters, optimization metrics, interoperability criteria. System designers must consider the indeterminacy brought about by these semantic interventions. What is lost by the optimization algorithm from original intentions? What is happening to aspects not modelled this way? How is this being verified and validated? To address these issues, a verification and validation step should be conducted with stakeholders (Dobbe *et al.*, 2021). Verification in this sense is the decision approving or denying that the system functions as specified, doing what it was meant to do, according to the expectations of stakeholders with different gender. Validation is the decision that the system applied to its operational environment functions as specified, interacts, and interoperates appropriately, and all risks and externalities are accounted for and handled. It is recommended that the A.I. trust has the mandate to make these decisions before deploying the DSS. Common optimization criteria, such as efficiency and accuracy should

be revisited, and the trust should be consulted to specify system criteria that matter to them as future users. Also, as these criteria will be value driven, in a pluralistic social environment, their contestability must be ensured.

The last indeterminacy is the agency dilemma, which, on the one hand is an extension of the digital divide, on the other hand, an acknowledgement of uncertainties occurring during system integration into specific contexts. To be precise, the agency dilemma is concerned with the degree of agency stakeholders retain in the case of non-participation, or in case of changing contexts (Hirschman, 1970). As stated in [section 4.2.1](#) on the digital divides, providing viable alternatives also fulfils the “right to exit”, whereas the channels to provide feedback and a commitment to engage with this feedback is appropriate to provide voice. However, it must be added that not all social groups and moral dimensions may be addressed at the conception of the DSS, such as women of a newly migrated ethnic group. It is thus highly important that procedures are in place to admit additional perspectives in the A.I. trust, on the basis of their articulated agency and the potential for their unjust exclusion.

CHECKLIST

To comply with the guideline, a robust approach to governance of computational decision-support, particularly that of A.I. is necessary. A dedicated institutional role is to be created to regulate both the design and the functioning of decision-support systems, formed by local stakeholders representing each CiPeL. Gender is to be considered in both the make-up and mandate of this new entity. Use the action items below to report compliance.

- Local stakeholders form A.I. trusts to oversee DSS design and deployment. The trust appropriately represents women, men, and marginalized groups in their intersection. The trust is active while the DSS has a bearing on democratic decision-making.
- Women, men, and marginalized social groups intersecting gender in the decision-support logic are provided adequate channels to assert and assess the inclusion of their perspectives in the A.I. trust, without sacrificing the feasibility of a democratic decision-making process.
- DSS features have undergone an audit with the A.I. trust on whether the interests of women and men and other marginalized groups are present or excluded reasonably. Solutions that fail this audit are excluded.

- The A.I. trust has the mandate to verify and validate DSS on the component level (corresponding to a single analytic task), and there are processes in place to re-verify and re-validate at reasonable intervals.
- The A.I. trust has procedures include further interests, and capacities to recognize their existence on the basis of agency and procedural justice.

4.4.2 Gender bias in decision-support systems

Optimization criteria and indicators for designing and tuning decision-support systems should include gender bias, intersubjectivity, and representational fidelity

A gender-blind approach to DSS design – i.e., the failure to recognize and design for diverse needs and consider different socially defined roles for men and women – carries the risk that pre-existing gender biases get hard-coded into the system without notice. There are three ways this can occur in the context of DSS:

- a systematic, implicit, or explicit devaluation or omission of gendered knowledges,
- making gender-biased (and often unconscious) assumptions when developing parametric models (which also extends to biased interpretations of outcomes, only there, the assumptions are made post-hoc), and
- taking gender-biased input data when executing non-parametric models.

The first cause is explored more in-depth in the following subsection on epistemic justice, whereas the scope of the A.I. trust prescribed earlier is sufficient to weed out biased assumptions for parametric models. This subsection thus focuses on the biases already in the data. Conventional wisdom would suggest that non-parametric approaches are resistant to biases, since they learn patterns from the data alone, not relying on assumptions. However, there are data sources which can already carry bias, misleading the algorithms that process them. Most notably, one such data is text data, the main input for natural language processing (NLP). NLP is prone to gender bias similar to language and communication itself (Leavy, 2018). There has been substantial scholarship examining how gender stereotypes and harmful gender relations pervade into language (Butler, 2005), literary and media content (Friedan & Quindlen, 2001), which has appeared in machine learning (Bolukbasi *et al.*, 2016). The ways gender bias appear in language is multifold, and the following is only a brief overview of the symptoms (the reader is referred to Mills for a more detailed account (2002)):

- the terms and labels used describe men and women (e.g., women being referred to as girls more often)
- the descriptive adjectives used in conjunction with men and women (e.g., women being described more by their appearance)
- the sentiment of metaphors about men and women (e.g., metaphors about women being more commonly derogatory)
- the frequency of mentions of men and women

It is the task of preprocessing to identify gender biases in the data-streams, before it is used in any kind of machine learning application. Even extracting features from biased data is to be avoided, meaning such exercise should occur the latest before feature engineering, and after the merging of datasets, unless some datasets have unique, previously identified gender biases that can be more efficiently captured before any processing.

Gender bias can also be the result of procedural epistemic injustices. Epistemic injustice is a marginalization as a knowledge-producer (Coady, 2010). This can either manifest as a devaluation of the credibility of one's knowledge – known as testimonial injustice – or as an inability to make sense and articulate meaning to a social experience – known as hermeneutic injustice (Fricker, 2013). In the context of gender, an example for testimonial injustice would be not taking seriously the inputs of a female colleague at a meeting. Not reporting cases of sexual harassment, because that specific form of harassment was never articulated as unacceptable, would constitute a hermeneutic injustice (Fricker, 2007). DSS will rely on knowledges, objectively measured, as well as subjective experiences and local knowledges. Furthermore, the outputs of these DSS may feed into smart contracts that allocate resources, rights, or duties based on the same knowledge. As the scope of institutional technologies increase, so does the impact of epistemic injustice, since devaluing knowledges, and failure to articulate them will potentially restrict political freedom and translate to distributive injustices.

To safeguard epistemic justice from the perspective of gender-sensitivity, two criteria must be met, (1) appropriately considering the perspectives of people with different gender, and (2) providing pathways for individuals to contest any decision from their own perspectives (Pettit, 1999). This mostly applies to participatory processes, such as the conduct of the A.I. trust, but also to any channel that interacts with stakeholders. The first criterion focuses on the prevention, detection, elimination of gender bias. There are multiple ways to tackle bias, any countermeasure will be context-specific, thus it is not in the scope of this guideline to prescribe solutions. What is recommended however, is that the avoidance of gender bias is

formalized as an optimization criterion for any tool that accesses or processes data, initiative, contestation, feedback, opinion coming from people.

The second criterion means that all women and men using the tool should be able to express their opinions, priorities, interests in their own model of reality, and should have capacities to translate implications of decisions and performances according to their model of value. This means that either mechanisms, or facilitation methods should be in place to efficiently provide a conversion from individuals to a shared symbolic space of deliberation. The former applies to the knowledge brokerage module, whereas the latter to interactions between the system designers and stakeholders. It is further recommended that there is a reflection step in place that tests for information loss between individuals and the shared symbolic space. Additionally, fidelity is recommended to be included as an optimization criterion for any tool that engages in such conversion of data.

However, it must be noted that conversion does not mean people should not be left in their information bubbles, as it does not respond to hermeneutic injustices (Fricker, 2013). It is also the task of knowledge brokerage, whether the module to be developed in T3.3.3, or any of the engagement activities, to facilitate the exchange of values, norms, perspectives between social groups. Ironically, the same tools employed by social media to create information bubbles, are also adequate tools to overcome them, such as recommendation engines, information foregrounding, and content sharing in general. What is missing from them is the intent to facilitate intersubjectivity – the sharing of subjective experiences. Therefore, it is recommended to employ intersubjectivity as an optimization criterion for any interface between stakeholders and JUSTNature digital solutions.

CHECKLIST

This guideline is relevant for partners engaged in the development of any digital tool where the functionality depends on processing and analysing data. To comply, the developers are instructed to take up additional metrics to optimize the tools to eliminate gender bias. Use the action items below to report compliance.

- For text data, an assessment of common gender biases in language and communication is conducted during preprocessing, and before featurization.
- Gender bias is formalized as an optimization criterion for any tool that accesses or processes data, initiative, contestation, feedback, opinion coming from people.

- Stakeholder-to-system fidelity is formalized as an optimization criterion for any digital tool that converts data.

- Intersubjectivity is formalized as an optimization criterion for any interface between stakeholders and digital tools.

5 TRAINING MATERIAL ON GENDER SENSITIVE URBAN DESIGN

Relating task	Recipient
Task 4.3 Co-facilitating the local operationalization of the city practice lab (M1-M54)	E2ARC, PI
Task 5.1 Low carbon High air quality NbS concept design in the CiPeLs (M1-M24)	E2ARC, TUM, TUC, UM, ABUD, EURAC, KYDON, MUC, LEU, MERANO, COBZ, GLC, SMJVO

5.1 Description of work

As part of the gender guidelines, a gender-sensitive urban design portfolio was developed (see [section 7.5](#)). The portfolio will be presented to the participants of the 1st CiPeL meeting, as part of the gender sensitivity training held by ABUD. Additionally, it will be used by the facilitation team on one of the workshops with local stakeholders. This training material is prepared in support of the facilitation team, and it will be presented to them as part of a training dedicated to gender sensitivity¹².

The JUSTNature gender sensitive urban design portfolio provides practical solutions for a gender-sensitive and just nature building in cities. The portfolio is based on best practices from the Global North, research articles and policy documents. An important source of information was the City of Vienna, which has a 30-year-long history of gender mainstreaming.

5.2 How to use the portfolio and the training material?

The portfolio is not a list of mandatory design elements, nor it is a fully comprehensive collection of gender sensitive urban design solutions. It is a source of inspiration, based on which a discussion and brainstorming can be started with local stakeholders in an interactive workshop. Local women, men, girls, boys know the best, what their needs are and what kind of design solutions serve their interests. For a gender sensitive urban development, it is vital to ask them what they actually want, ideally on one of the local stakeholder workshops.

¹² For the trainings, the portfolio will be extended with explanatory texts. For the local workshop, it is recommended to use the portfolio without explanatory texts, as it can be seen in the Appendix, so that to avoid limiting the creativity of workshop participants.

Each of the following sections is about one solution of the gender sensitive design portfolio and serves as background information for the facilitation team moderating the discussion among local stakeholders. The sections start with discussing the relevance of the solution to gender equality and continue with relating design principles and a case study.

It should be noted there can be significant differences within CiPeLs in the local stakeholders' reception of gender-related questions, and thus, the facilitation team should carefully plan how to present the portfolio to locals. Because of cultural and historical reasons, there are more conservative and more liberal countries, and more conservative and more liberal cities within a country, which difference might appear on the level of CiPeLs. In some CiPeLs, the local participants might expect to bring gender-sensitive design solutions to the forefront. As opposed to this, in other CiPeLs the use of "gender" as a word can result in a political attack on the JUSTNature project. While in the former case, it is advisable to emphasize more the considerations behind gender sensitive design, in the latter case, it might be worth keeping gender sensitive design as a hidden agenda and avoiding conflictual wording.

Before the local workshop

- Translate the gender sensitive design portfolio ([section 7.5](#)) to the local language and adjust the texts to the everyday language.
- Plan, how you intend to present gender sensitivity to locals. Avoid being paternalistic and respect local values.
- Prepare with solutions to make interactive the workshop, for example white board and post-its to collect the ideas of locals.
- For more tips on gender sensitive workshop facilitation, check out the related gender guideline ([Chapter 3](#)).

5.3 Accessibility

Relevance

- Accessibility allows for all user groups to take full advantage of their urban environment. Gender sensitive design means not only creating a barrier-free environment for people with physical disabilities, but also it considers the needs of people with care activities and family responsibilities (carrying shopping bags, walking with prams and accompanying children, disabled and elderly people) and the needs of people with temporarily reduced mobility.

- Women are less likely to have cars than men, especially in older generations and in less affluent families. If a family has only one car, it is more likely to be used by the male household head. At the same time, women tend to be responsible for care work within families and thus they are more reliant on public transportation and walk. Therefore, a barrier-free, walkable, and healthy urban environment is more crucial for them than for men (Irschik *et al.*, 2013; Vance *et al.*, 2005).

Design principles

- short distances
- decrease of mobilized traffic
- barrier-free public spaces and crossings (no level difference between pedestrian areas and traffic areas, elevators, and slopes, if needed)
- sign-posted barrier-free solutions
- barrier-free seats and benches, which fits to the different body-sizes and abilities of people
- wide sidewalks (Figure 8)
- accessible and safe public toilet facilities
- analysis of mobility patterns of user groups

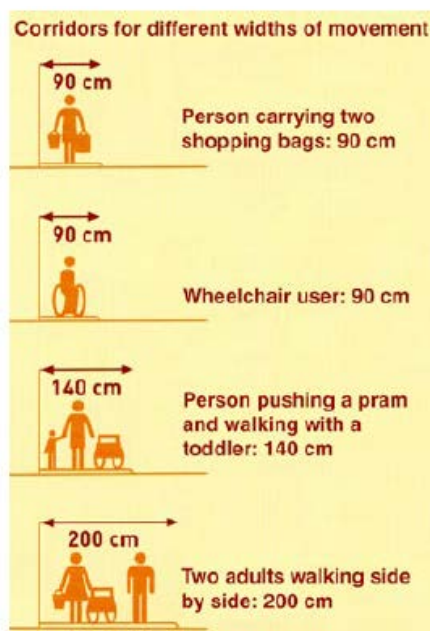


Figure 8: Required width of pathways for different user groups
(Source: Irschik *et al.*, 2013)

Case study: Superblocks, Barcelona

Barcelona Superblocks (Barcelona Superilles) are 400 m x 400 m large urban blocks, which were redesigned by giving priority to pedestrians over cars with a focus on accessibility, and by involving local community. Minor streets within the blocks are closed to through traffic, and only public transport, vehicles transporting disabled people, ambulance cars, bikes used for recreation, and vehicles of residents are allowed to enter to the block. Motorized traffic is allowed only in one direction, and there is a speed limit for motorized traffic and micro-mobility too. As a result, roads became open and safe for pedestrians (Postaria, 2021).



Figure 9: Superblock, Barcelona
(Source: Col.Superilla P9)

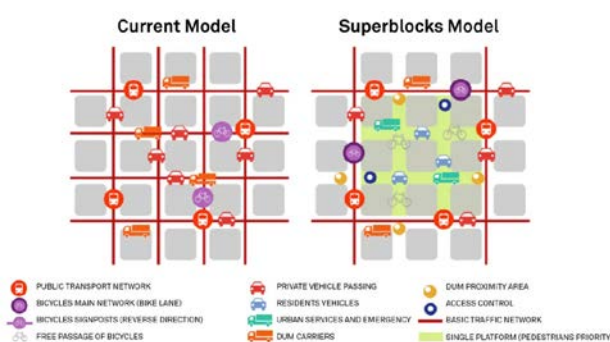


Figure 10: Superblock, Barcelona
(Source: Ajuntament de Barcelona)

5.4 Security

Relevance

- Because of worrying about their personal safety, most women are afraid to walk alone in their neighborhood at night. This fear can lead to restricting themselves in their daily activities and limiting themselves in taking full advantage of their environment. Nevertheless, safer conditions could increase the willingness of women, who are currently restricting their activities out of fear, to go out alone in their neighborhood at night (Keane, 1998).
- Urban design can increase the level of perceived safety¹³ in people. While similar environmental factors influence positively the perceived safety of men and women,

¹³ Perceived safety may differ from actual personal safety, however, in terms of behavioural self-constraints, it is perceived safety which matters. Perceived safety can be defined as a general fear of becoming a victim, which is associated with specific social contexts, like walking alone at night (Blöbaum & Hunecke, 2005).

women tend to feel less safe under similar conditions than men, likely because women feel themselves to be less capable of self-defense (Loewen *et al.*, 1993).

- Perceived safety can be supported by providing escape routes, prospect and good quality of lighting (Blöbaum & Hunecke, 2005).
- Permanent human presence can not only contribute to perceived safety, but also to actual personal safety (McMillen *et al.*, 2019; Philpot *et al.*, 2020). Human presence can be ensured by the mix of functions, generating human activity in public space in different times of the day (e.g. residential buildings, office buildings and services). Moreover, 'eyes upon the street', that is, windows, porches of buildings looking at the public space can also support the surveillance of a neighborhood (Jacobs, 1961).

Design principles

- lighting (Figure 11):
 - avoid sharp drop-off of light beyond paths
 - layered lighting: multiple light sources, which also light the surroundings and environmental elements serving as focal points and considers biodiversity
 - reflectivity of surrounding surfaces considered
 - LED light with warmer colors (Kalms, 2019)
- generate permanent human presence and surveillance: mix of functions, eyes upon the street
- engagement of women, children and other vulnerable groups: night walks, co-mapping for identifying places perceived as dangerous

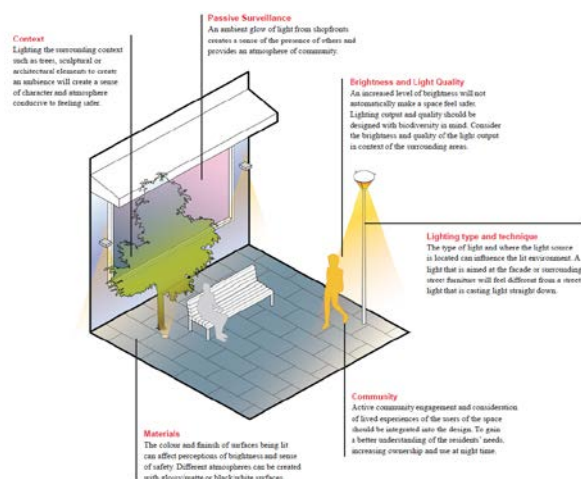


Figure 11: Effective lighting of public spaces for safety and inclusion
(Source: Hoa Yang, ARUP)

Case study: Shared spaces, Fort Street, Auckland

The redesign of Fort Street in Auckland, New Zealand is a good example for how human presence can be increased in public space and how it can support perceived safety. The new design followed the concept of 'shared spaces', which means that any kind of demarcation between vehicles and pedestrians is removed, prioritizing the needs of pedestrians. Shared space was created by removing curbs and creating a single level surface, and thus, a previously underused part of the street could be capitalized by adjacent businesses as terraces. At the same time, traffic was calmed and reduced by conventional measures. As a result of the new design, the number of pedestrians increased by 50%, local businesses are boosted, and 80% of surveyed people felt safer in the area now than they felt previously, especially at nighttime (Auckland Council, n.d.).



Figure 12: Shared spaces in Auckland
(Source: Auckland Council)

5.5 Playgrounds, schoolyards

Relevance

- According to studies, around the age of 10, gender inequalities are becoming more apparent in playgrounds among children.
- Boys of this age are becoming more dominant in playgrounds, while girls, getting to be more aware of their bodies and the expected behavior from girls, tend to disappear from these areas (Irschik & Kail, 2016).
- Researchers found that boys tend to occupy the central area of the playground with noisy and sporty activities. It is often the area where the football pitch is located. At the same time, girls and un-sporty and overweighted children are relegated to the periphery of the space (Maruéjols-Benoit, 2014).

- Playground designs in general tend to support the outdoor activities assigned to boys (skateparks, football pitches), while there are hardly any areas specifically dedicated to girls (*ibid.*).
- Policymakers believe that playgrounds and schoolyards, as first place where children gain experience of public space, plays a key role in support of gender equality.
- A gender sensitive playground design aims at deconstructing gender stereotypes and allow the children to choose freely the way they would like to play (Kneeshaw & Norman, 2019).

Design principles

- involving children and teachers in the design process
- creating multiple and equally important worlds instead of one central area
- allowing for equal accessibility and mixed use
- including design elements supporting creativity and engagement
- supporting navigation between places instead of stagnation in one place
- using gender-neutral colors, i.e. colors not associated with any genders

Case study: Ille Elementary School, Rennes

The schoolyard of Ille Elementary school in Rennes (École Publique Élémentaire Ille) was redesigned, as part of the city's program to create climate resilient and gender equal schoolyards (Rennes Métropole, 2020). In the new design, which was developed together with children and teachers, the football pitch occupies a smaller and less central area. The activities are decentralized, and the spatial design supports circulation of children among places instead of staying of them at one place. Therefore, there is no dedicated place for one type of children but the spatial design supports the mixing of children (Roberti, 2020).

Besides, in redesigning the schoolyards, the aspects of sustainability were also considered. As opposed to having asphalted areas, green areas were restored and permeable pavement was used, allowing for the infiltration of rainwater into the soil. Moreover, the color of the pavement is light, which reduce the effect of urban heat island effect (Rennes Métropole 2020).

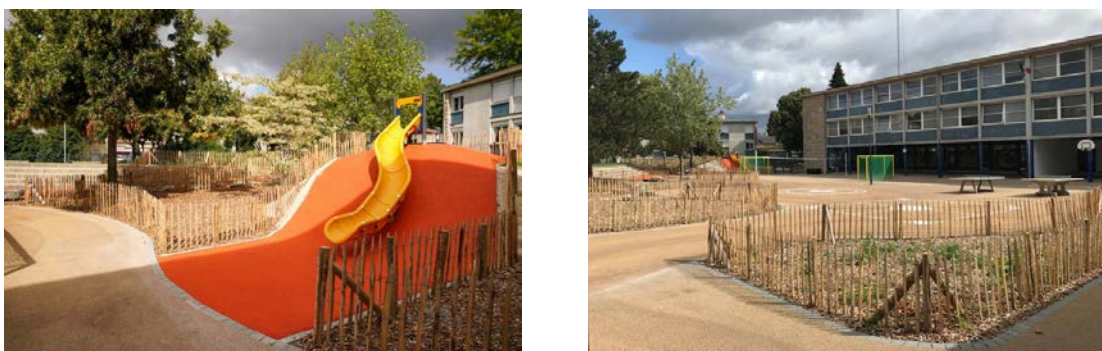


Figure 13: Schoolyard free from gender stereotypes

5.6 Public toilets

Relevance

- Because of the division of work within families, women tend to use public spaces and public transport more than men in daytime, and often accompanying children or elderly and disabled relatives. Furthermore, women urinate more frequently than men, especially in certain periods in their life, for example during pregnancy. As a result, they are more reliant on public toilet, which is a lack in most cities.
- Women, due to the lack of public toilets, are likely to 'hold on', which can lead to health issues, like the increase the propensity for continence problems.
- Public toilets are important not only for women:

- The elderly and people with disabilities might not go out because of being afraid of the lack of toilet when they need one.
- The proliferation of nightlife and alcohol consumption in cities, and the lack of public toilets has resulted in increased street urination, which set the conditions for the spread water-borne diseases in city streets (Greed, 2006).

Design principles

- safe: public toilets should be placed centrally in the public space, in open and well-lit areas to disable vandalism (Figure 14)
- accessible:
 - public toilets should be positioned on street level
 - adequate signage should show where to find them
 - clear pathways should lead to them
 - toilet should be provided for people with disabilities
 - cubicle should be spacious enough for pregnant women, parent and child, etc.
 - adequate number of toilets are needed considering potential peaks of use
 - all gender toilet should be provided
 - gender neutral baby changing room should be provided (fathers may change diapers too)
- clean: efficient maintenance and regular cleaning regimes should be ensured

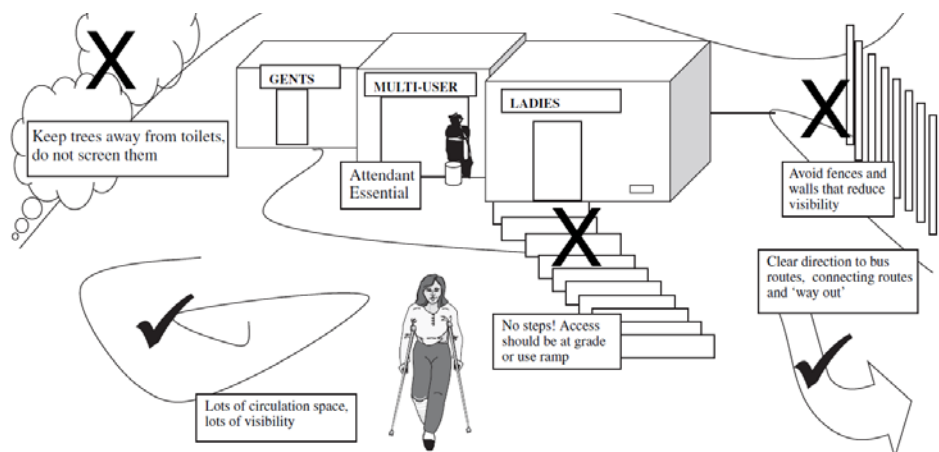


Figure 14: Ideal location of public toilets
(Source: Greed, 2006)

Case study: Public toilet in Tokyo (Shigeru Ban)

The public toilet was designed by the famous Japanese architect, Shigeru Ban, as part of the Tokyo Toilet project. The Tokyo Toilet project by Nippon Foundation, Shibuya City Government, and the Shibuya Tourism Association, is intended to create 17 new public toilets in Tokyo's Shibuya district (Nippon, 2020). Shigeru Ban designed transparent walls for the public toilet so that to counteract the public perception that public toilets are dark, dirty, and dangerous. The transparent walls allow the users to see how clean stalls are and whether they are occupied. When the toilet is occupied, walls become non-transparent. To further support the perceived safety of users, the public toilet is easily accessible and visible from all sides. Besides, as part of the Tokyo Toilet project, Shibuya City Government developed a transparent strategy for cleaning and maintenance of public toilets and monitoring their conditions.



Figure 15: Public toilet in Tokyo, by Shigeru Ban
(Source: Satoshi Nagare)

5.7 Representation

Relevance

- The representation of women in public spaces is very imbalanced, stereotypical and does not reflect the diversity of women.
- The number of streets named after men tends to be significantly larger than women. Similarly, the number of statues depicting men tends to significantly outnumber ones depicting women, especially if we speak about historical figures (Rooney, 2022). Female statues are often fictional and allegoric ones (like liberty, peace, etc.) and/or portrayed as acts. Gender-imbalance in statues and in street names can create a false impression that they are only the white men, who are making so important achievement for the society that they should be commemorated. Allegoric

figures and acts can strengthen gender stereotypes, by essentializing characteristics considered as feminine (i.e. ethereal, motherly).

- Many street advertisements are still operating with gender stereotypes. On billboards and posters, women are often young, white women, with perfect body, and their depiction is often over-sexualized, and related to activities considered as feminine, e.g. shopping, doing household chores. As opposed to this, men (similarly depicted as white, with perfect body but somewhat older) are portrayed while doing masculine activities, like driving a fast car and watching football (Rosewarne, 2005; Schroeder & Zwick, 2004). These adds are clearly not representing well the diversity of men and women, due to disregarding people with different body-type, age and skin-color, and they can even cause mental issues among people with “less ideal” parameters (Hine, 2011).

Design principles

Gender sensitive representation is important aspect of gender equal cities. However, if it is not applied together with other solutions which can support the equal opportunities of people with different gender, it is mere tokenism. It means that gender equality remains symbolic without any meaningful action to reach gender equality. Some recommendations for gender sensitive representation in public space are:

- strive for gender balance in public art, visual images and street signages
- deconstruct gender stereotypes in representation (e.g. man with toddler)
- recognize the diversity of men, women, girls and boys in visual images
- always apply gender sensitive representation together with other practical solutions

Case study: Streets named after women, Berlin

Similar to other cities around the globe, the majority of streets in German cities are named after men up until today. For example, in the mid-1990, only 2,4% of the more than 1500 streets, squares and public spaces in Berlin was named after a woman. Therefore, in Kreuzberg district of Berlin, an edict was passed that that streets and public places have to be named after women, until a balance is reached with men (Eddy, 2013).



Figure 16: Streets named after women, Berlin
(Source: Gordon Welters)

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7 APPENDIX

7.1 Gender sensitive training syllabus

GENDER SENSITIVITY TRAINING

Syllabus

While the integration of gender questions is important part of H2020 calls, according to the assessment of the first two years of the programme, only a few projects developed a real gender perspective in the research content and research design, and projects rarely implemented gender sensitivity trainings (de Cheveigné et al., 2017). In a research project like JustNature, a real gender perspective can only be achieved as a cooperative action of the consortium. Therefore, as a first step, a gender sensitivity training will be organized for selected consortium members.

General information

- Time November 24, 2021, 9.00 am – 12.30 pm CET (with 2 x 10 min. break)
- Form: online
- Platform: Zoom
- Trainer: 2
- Participants: 30

Participants

Since a capacity building workshop is the most effective in case of limited number of participants, we decided to select 30 partners from the consortium. The selection criteria were as follows:

- 1 project manager/city (person, who is responsible for JustNature project)
- 2 persons/organization, which will directly work on gender-related tasks
- 1 person/organization, which will not directly work on gender-related tasks

Regarding their interests, there will be two kinds of participants on the workshop:

- municipal employees (interest: gender-sensitive urban planning and design)
- researchers (interest: gender sensitive research and urban planning and design)

The participants have various professional background, ranging from physics and environmental engineering to legal studies and sociology. It can be assumed that the majority of participants have very little or no understanding of gender sensitivity, and a few participants having social scientific background have a basic understanding about gender questions. Therefore, the training should start from scratch.

Goal of the training

- Creating a common ground with the members of the consortium, which will support that the gender perspective will be present in the work of all work packages
- Showing how gendered norms shapes the roles of women and men in society
- Introducing what gender, gender mainstreaming and gender sensitivity mean
- Counteract potential negative stereotypes that are attached to gender-related topics
- Reflecting on the positionality of researchers in terms of gender to avoid gender-blind or biased research
- Unpacking the value of considering gender in research design and implementation, and in relation to urban planning and design

Topics of the training

- gender (socially constructed vs. biologically determined, context-dependency, intersectionality, etc.), gender mainstreaming (vs. equality de jure and positive action), gender sensitive planning and design (vs. gender blind planning and design)
- gender-blind/gender-biased research, researchers' positionality (consequences of gender bias in research), gender sensitive communication in a research group
- gender sensitive data collection (importance of gender-disaggregated data collection, discrimination of AI, gender-blind/gender biased big data analysis)
- gender and environmental justice, gender sensitive urban planning and design (what is gender-sensitive urban planning and design, examples, needs of women, analysis of case studies on the workshop)
- gender sensitive co-design/co-governance, questions of epistemic justice (focusing on the participatory process)
- importance of gender strategies, legislations, enforcement of legislation

Expected outcome

At the end of the training, the participants will

- understand what gender, gender mainstreaming and gender sensitivity means in research, and urban planning and design,
- internalize gender perspective as much as possible,
- have a better understanding on what gender-blind and gender-sensitive urban planning and design mean.

The researchers will be

- more sensitive to gender-biased/gender-blind research and gendered power relations in a research group,
- more aware of their positionality as researchers.

Limitations

For practical reasons, the training is limited to 3,5 hours. In such a short time, it is not possible to achieve significant attitude change. This training must be seen as an initial effort for developing a gender perspective within the consortium, which future gender mainstreaming tasks can build on.

Agenda

Part 1: Introduction & Gender

Part 2: Research & Gender Mainstreaming

Part 3: Urban Planning, Design and Policy

7.2 Checklist for gender sensitive stakeholder mapping

GENDER-DISAGGREGATED DATA COLLECTION

- Information about the gender of stakeholders was requested.
- JUSTNature data protection strategy was followed in relation to collecting and processing stakeholder data.

GENDER QUOTA

- The share of male and female participant is 50/50%, or at least it is within the range of 40/60% or 60/40% both among professional and non-professional stakeholders.

INTERSECTIONALITY

- The local social context was analysed in terms of age, social status, religion, racial and ethnic composition. Vulnerable groups are identified, and in this context, gender inequalities are assessed within T2.2.
- In line with the analysis of the social context, relevant private and public institutions and NGOs are identified, with special attention to gender-specific organizations.
- Anonym surveys are conducted among the stakeholders to check, whether local vulnerable groups are represented among the stakeholders.

POWER-MAPPING

- A power map of stakeholders was drawn up and analysed within T4.4.

7.3 Checklist for gender sensitive workshop facilitation

BEFORE THE WORKSHOP

- Gender-balance is ensured within the workshop facilitators per CiPeLs.
- Workshop facilitators are aware of how gender and intersectionality can set barrier to the active participation of some stakeholders on the workshop, and are able to use facilitation methods and tools to ensure equal and fair participation.
- Workshop facilitators are aware of their own preconceptions and personal biases.
- The workshop is held in a place, which is safe and accessible to everyone (e.g. women, people with prams, elderly people, disabled people, ethnic minorities, etc.)
- The workshop is held in a time, which is likely to fit people with different gender and local marginalized social group.
- Childcare is provided at the workshop.
- The invitation to the workshop encourages people with different gender and social background to participate in the workshop.
- A survey is held among the participants to evaluate the fulfilment of gender quota and quota of other marginalized groups.
- Hard-to-reach groups are locally mapped and adequate methods are applied to their involvement

ON THE WORKSHOP

- The number of contributions made by women and men are registered, as much as possible, and in case of imbalances, corrective measure is made to enhance equal participation.
- Different ways of participation are allowed on the workshop (large group and small group discussion, individual contribution)
- In case of gender-related questions, group discussions and/or programs are organized by gender, and their findings are shared with the large group to allow for mutual learning.
- Facilitators react to gender-discriminatory language use and gender stereotyping of participants and actively counteract them.

- Problems, burning questions, needs are mapped on the workshop, according to gender, and goals were set up based on them.
- Specific actions are identified to meet the gender-related goals.
- Indicators are developed and tracked to monitor the implementation of gender-related goals.
- The implementation of the gender-sensitive solutions are communicated transparently to the participants and feedbacks are allowed.
- Gender-sensitive technical solutions are introduced to the participants.
- Inclusive and gender sensitive (or gender-neutral language, when adequate) is used during the workshop.
- Workshop facilitators challenge gender stereotypes.
- Facilitating roles and time is shared equally between the workshop facilitators.
- Images, used in the workshop, challenge gender stereotypes and reflect the diversity of people.

AFTER THE WORKSHOP

- Demographic data is analysed by gender and compared with the social composition in the neighbourhood. Potential imbalances are detected, and corrective measures are defined for the next workshop.
- Number of contributions made by people with different gender and of social group are analysed. Potential imbalances are detected, and corrective measures are defined for the next workshop.
- Participation gap is analysed on the entire user journeys of different gendered personas.
- Gender-disaggregated feedback is collected from the participants on the gender-sensitive organization and facilitation of the workshop.

7.4 Checklist for gender sensitive monitoring and digital technologies

ELIMINATING DIGITAL DIVIDES

- Each affordance offered by the digital portfolio of JUSTNature in the CiPeLs is mapped, their accessibility tested according to gender, their implication to women and men evaluated.
- Alternative, more accessible and equitable instruments for the same affordance are proposed, where needed.
- Gender-based roles are codified in personas when assessing user experience, and for any represented women and men locally valued use-cases are provided throughout the NbS lifecycle to (1) equally represent both roles and (2) uptakes roles that mixes both traits.

GENDER-TRANSFORMATIVE TECHNOLOGIES

- During usability testing, all affordances with a gender-transformative potential are itemized.
- Gender-transformative affordances are evaluated based on their linkages to existing, gender-transformative social trends in each CiPeL
- Gender-transformative affordances are assessed for potential adverse impacts on gender discrimination and violence

POLITICIZED DIGITAL TECHNOLOGIES

- In digital twins, and decision-support tools, any represented woman and man, and social group can observe how they, their interests, and their perspectives are abstracted.
- In digital twins, and decision-support tools, any represented woman and man, and social group can formally express their opinions on it and has opportunities to calibrate this abstraction.
- In digital twins, and decision-support tools, any represented woman and man, and social group can recall their abstract representation.

GENDER JUSTICE IN MONITORING

- Gender risk pre-assessment is compiled from WP2 knowledgebase, scientific literature, and recommendations of trusted major international organizations
- Gender risk assessment is conducted with CiPeL stakeholders, resulting in a set of objectives for indicator development
- Impact data is collected in a gender-disaggregated way, and for all social variables listed in [section 2.4](#)
- Spatial distribution of people of certain social variables listed in [section 2.4](#) is available

A.I. GOVERNANCE

- Local stakeholders form A.I. trusts to oversee DSS design and deployment. The trust appropriately represents women, men, and marginalized groups in their intersection. The trust is active while the DSS has a bearing on democratic decision-making.
- Women, men, and marginalized social groups intersecting gender in the decision-support logic are provided adequate channels to assert and assess the inclusion of their perspectives in the A.I. trust, without sacrificing the feasibility of a democratic decision-making process.
- DSS features have undergone an audit with the A.I. trust on whether the interests of women and men and other marginalized groups are present or excluded reasonably. Solutions that fail this audit are excluded.
- The A.I. trust has the mandate to verify and validate DSS on the component level (corresponding to a single analytic task), and there are processes in place to re-verify and re-validate at reasonable intervals.
- The A.I. trust has procedures include further interests, and capacities to recognize their existence on the basis of agency and procedural justice.

ELIMINATING GENDER-BIAS IN DECISION-SUPPORT SYSTEMS

- For text data, an assessment of common gender biases in language and communication is conducted during preprocessing, and before featurization.
- Gender bias is formalized as an optimization criterion for any tool that accesses or processes data, initiative, contestation, feedback, opinion coming from people.
- Stakeholder-to-system fidelity is formalized as an optimization criterion for any digital tool that converts data.
- Intersubjectivity is formalized as an optimization criterion for any interface between stakeholders and digital tools.

7.5 Gender-sensitive urban design portfolio

The following portfolio is a collection of good practices for each of the design principles discussed in [Chapter 5](#). It was shown as a presentation for the facilitation teams of each project partner during the gender-sensitive urban design workshop held by ABUD, as illustrations to the design principles.

Gender-sensitive design

Portfolio

Rebeka Dora Balazs (ABUD)

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Accessibility



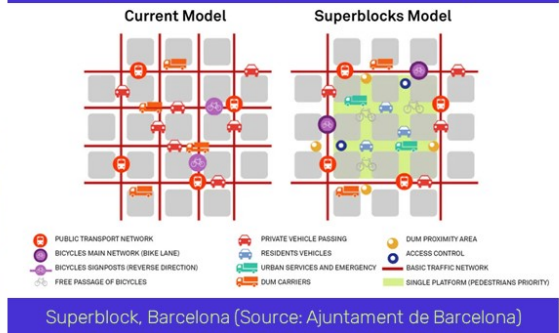
Barrier-free sidewalks, Vienna (Photo: City of Vienna)



Superblock, Barcelona (Photo: Col Superilla P9)



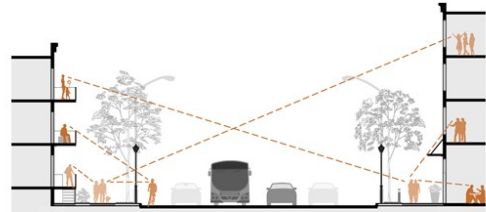
Wide pedestrian pathways, Vienna (Photo: Luiza Puiu)



Security



Public lighting, Vienna (Photo: City of Vienna)



Eyes upon the street (Figure: Minneapolis 2040)



Seasonal events, Auckland (Photo: POP Ping Pong)



Shared spaces, Fort Street, Auckland (Photo:)

3

Playgrounds, schoolyards



Schoolyard free from gender stereotypes, Rennes (Photo: Arnaud Loubry)

4

Public toilets

JUS
NA



Tokyo toilet, Takenosuke Sakakura (Photo: Satoshi Nagare)



Tokyo toilet, Shigeru Ban (Photo: Satoshi Nagare)



Baby seat in the toilet
(Photo: Satoshi Nagare)



Cleaning staff
(Tokyo sanitation Co.)

Representation

JUS
NA



Public transport signages, Vienna
(Photo: Gordon Welters, Ismail Gökmen)



Anna Kéthly, Hungarian politician
(Photo: Szabárd Szakál)



Gender-neutral baby changing room
(Photo: Col.lectiu Punt 6)



Streets named after women, Berlin
(Photo: Gordon Welters, The New York Times)



Supporting women through menopause, naturally.

HOLLAND & BARRETT

Advertisement with diverse women
(Source: Holland & Barrett)