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EXECUTIVE SUMMARY

Nature-based solutions work with nature with the aim of providing benefits both for natural ecosystems and the people that depend on them. Theoretically, they are interventions that are inspired by nature and are designed and implemented in cooperation with and with the consent of local communities. While the former may hold true in practice, the latter is too often reduced in importance compared to the environmental aspects. As nature-based solutions are not inherently socially just, it is important to apply social equality mechanisms when planning, implementing, monitoring and evaluating them. By doing so, synergies between human well-being, including gender equality, and ecosystem benefits can be maximised. The paper thus aims at providing not only evidence why gender mainstreaming and participatory approaches are beneficial both for gender equality and the effectiveness of nature-based solutions, but also that this needs to be actively pursued globally.

1.0 INTRODUCTION

Nature-based solutions (NBS) work with nature with the aim of sustaining both natural ecosystems and the persons that depend on them. They are interventions that are inspired by nature and are designed and implemented in cooperation with and with the consent of local communities. According to B. Sowinska-Swierkosz and J. Garcia¹, in order to be recognised as NBS, they have to actively involve, through a transparent process, all stakeholders affected by the intervention, irrespective of their age, gender, social, economic or cultural background. Sowinska-Swierkosz and Garcia specify that NBS need to be locally adapted and socially acceptable, they need to include not only scientific, but also local and traditional knowledge, and all of the above cannot be ensured without the participation of various actors, including citizens, non-governmental organisations (NGOs), businesses and researchers.

Top-down models therefore do not fit the NBS approach. It is necessary to ensure that those affected by the intervention are involved in all of its stages, namely its design, implementation, management, as well as its monitoring and evaluation. In this process, it is important to note and take into consideration that the impact of the solution on stakeholders may vary. It is thus essential first to conduct a thorough analysis about the potential stakeholders and beneficiaries of the intervention, second to ensure their equitable inclusion in the above mentioned stages, third to assess the impact of the approach on all identified groups from the first step, and lastly to take corrective measures in order to ensure all groups benefit equally from the solution.

NBS can also be used to tackle water management challenges, may it be in agriculture, sustainable cities, water quality or disaster risk reduction. The objective of the EU funded project ModULAR Tools for Integrating enhanced natural treatment Solutions in Urban water CyclEs (MULTISOURCE) is to facilitate the systematic, city-wide planning of nature-based solutions for urban water treatment, storage, and reuse. The intersection of environment, circular economy, society and policy is key to MULTISOURCE's modus operandi, and an important consideration in the project is ensuring social inclusion and equality, including a gender-sensitive perspective.

This research paper, one of the deliverables of MULTISOURCE, aims at gaining better insight on the intersection of nature-based solutions (NBS), NBS for water treatment (NBS^{WT}) and gender. Stemming from the above-mentioned definition of B. Sowinska-Swierkosz and J. Garcia, its purpose is to identify key issues for partners of the project to apply a gender-sensitive approach when engaging with stakeholders, aimed at promoting gender equality, and to show that addressing gender contributes to water use efficiency, as well as environmental sustainability.

There are 4 chapters in this literature review. Following the introduction, the second chapter presents basic concepts related to NBS and gender, and it provides the reasoning why attention needs to be paid to mainstreaming gender into the environmental and water agenda. The third chapter identifies existing research on the intersection between gender, resource management and NBS. It starts by setting a social equity framework, which describes the stages of a continuous process necessary to create and maximise

¹ Sowinska-Swierkosz, B. N. and Garcia, J. (2022). What are NBS? Setting core ideas for concept clarification. *Nature Based Solutions*, Vol. 2, January 2022. <https://www.sciencedirect.com/science/article/pii/S2772411522000015>

synergies between the social, environmental and economic dimension. Using this framework, it then provides examples of gender-sensitive approaches in forest management, climate change and agriculture, water and in urban green spaces. Most of the successful approaches identified are from countries of the Global South, where the vast majority of the gender-environment nexus is researched. Evidence is provided in each of the subsections to show that the need for similar research and activities exists in countries of the Global North as well. The fourth chapter provides an overview of the necessary steps needed to mainstream gender into the project, based on already existing toolkits from the fields of integrated water management, ecosystem-based adaptation, biodiversity, climate and land degradation, and irrigation. The last chapter offers concluding remarks on the need to step up the commitment of treating equally the three dimensions of NBS and not only mainstream gender in projects all over the world, but also to ensure NBS devote more attention to social equality in general.

2.0 GENERAL CONCEPTS

2.1 Nature-based solution

Environmental degradation has become a global concern, which poses numerous societal challenges, such as climate change, food insecurity, biodiversity loss and migration. There is growing awareness and support to using **nature-based solutions (NBS)** to protect societies and biodiversity from the impact of global challenges. In 2016, members of the International Union for Conservation on Nature (IUCN) adopted a resolution², in which NBS are defined as “actions to protect, sustainably manage and restore natural or modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits.”

According to B. Sowinska-Swierkosz and J. Garcia³ NBS must fulfil the following criteria:

- They are inspired or supported by nature;
- They refer to societal challenges and aim to solve them;
- They offer multiple co-benefits, including human well-being and biodiversity gains and;
- They are highly effective and efficient.

For interventions to be defined as NBS, they must have clearly defined goals, partners, beneficiaries, and management systems. In addition to achieving benefits for the ecosystem, their primary objective must go beyond that to obtain additional benefits. Solutions that solely benefit the environment or society cannot be considered as NBS, and it is essential that actions create synergies and ensure a fair distribution of benefits and costs. In other words, all three categories – environmental, societal and economic – have to be treated as equally important. To ensure that, a transparent process needs to be undertaken, involving all the stakeholders affected by the action. Without an obtained compromise by all relevant actors, the proposed action can lead to amplified social and / or economic inequalities within the community. Achieved conservation objectives that

² IUCN (2016). WCC-2016-Res-069.

https://www.iucn.org/sites/dev/files/content/documents/wcc_2016_res_069_en.pdf

³ Sowinska-Swierkosz, B. N. and Garcia, J. (2022). What are NBS? Setting core ideas for concept clarification. *Nature Based Solutions*, Vol. 2, January 2022. <https://www.sciencedirect.com/science/article/pii/S2772411522000015>

are not locally endorsed, accepted and governed therefore fail to place the three pillars on equal footing.⁴

In this chapter, the focus is on four elements that are related to NBS effectiveness and ensure social equity at the same time: effective address of societal challenges, stakeholder participation, synergies and trade-offs, and adaptation to local circumstances.

It is important that NBS address a **societal challenge identified as a priority**⁵ by those that are or will be directly affected by it. This entails that all beneficiaries and right-holders express their views and opinions on what they perceive as most relevant and how they will be affected by it, but also that everybody understand the rationale of all involved stakeholders. This will contribute towards future accountability and the optimisation of strategies contributing to human well-being.

The best way to ensure the identification of most relevant challenges is through **stakeholder engagement**⁶. Broad engagement of diverse groups, including inhabitants, civil society, academics, practitioners, business and decision-makers need to be ensured in all the stages of the project. This will offer the best guarantee that a sound environmental solution will be acceptable and accepted by the society, and will also respect and reinforce local communities and their rights over natural resources.

The stakeholder engagement can also serve as a process to address the **synergies and trade-offs between different benefits**⁷ provided by NBS. Not all stakeholders attach the same value to diverse benefits, which means that it is important they are presented to all that will be impacted. Trade-offs then need to be negotiated, balanced and managed in a transparent and inclusive manner. Future implications of NBS also need to be considered, and where risk is unavoidable, periodical reviews that will safeguard the agreed upon synergies and trade-offs need to be put in place, especially as the dynamics between various stakeholders may change over time.

Two local perspectives need to be included in all stages of NBS. The first one is **adaptation to local environmental conditions**⁸ and requirements, which means that every case needs to be addressed separately. The second one is **inclusion of local and traditional knowledge**⁹ about ecosystems and their sustainable management. Both will lead to higher NBS effectiveness.

⁴ Ibid.

⁵ IUCN (2020). IUCN Global Standards for nature-based Solutions. A user-friendly framework for the verification, design and scaling up of NbS. <https://portals.iucn.org/library/sites/library/files/documents/2020-020-En.pdf>

⁶ Sowinska-Swierkosz, B. N. and Garcia, J., 2021. A new evaluation framework for nature-based solutions (NBS) projects based on the application of performance questions and indicators approach. *Science of The Total Environment*, Vol. 787. <https://www.sciencedirect.com/science/article/pii/S0048969721026863>

⁷ IUCN (2020). IUCN Global Standards for nature-based Solutions. A user-friendly framework for the verification, design and scaling up of NbS. <https://portals.iucn.org/library/sites/library/files/documents/2020-020-En.pdf>

⁸ Sowinska-Swierkosz, B. N. and Garcia, J. (2021). A new evaluation framework for nature-based solutions (NBS) projects based on the application of performance questions and indicators approach. *Science of The Total Environment*, Vol. 787. <https://www.sciencedirect.com/science/article/pii/S0048969721026863>

⁹ Seddon, N., Sengupta, S., García-Espinosa, M., Hauler, I., Herr, D. and Rizvi, A.R. (2019). *Nature-based Solutions in Nationally Determined Contributions: Synthesis and recommendations for enhancing climate ambition and action by 2020*. Gland, Switzerland and Oxford, UK: IUCN and University of Oxford. <https://portals.iucn.org/library/sites/library/files/documents/2019-030-En.pdf>

2.2 Gender

According to the European Institute for Gender Equality (EIGE), **gender** is defined as “social attributes and opportunities associated with being female and male and to the relationships between women and men and girls and boys, as well as to the relations between women and those between men”¹⁰. Gender is a socially constructed category that varies with context and time, and is changeable.

The attributes, opportunities and possibilities are learned and internalised through socialisation. The gender, which is prescribed at birth according to the biological sex of a person, determines what is expected, valued and allowed in men and women in a given time and context. Based on these perceptions, there are inequalities in all societies between women and men in numerous areas, such as assigned responsibilities, level of power and opportunities, access to and control over resources, decision-making opportunities etc. An approach that considers the existence of mentioned perceived differences, analyses their impact on the lives of women, men and other people and actively works towards ensuring equality is considered a **gender approach**.

The goal of such an approach is to ensure **gender equality**¹¹, which is defined as equal rights, opportunities, possibilities and responsibilities of all people. The aim of equality is not to make everybody the same, but to ensure that regardless of being born female or male, everybody enjoys the same opportunities and responsibilities.

To promote gender equality in NBS, several gender tools can be used. **Gender mainstreaming** consists of integrating the gender perspective into the preparation, design, implementation, monitoring and evaluation of policies and programmes. Its aim is promoting equality between all.¹² Relating to water management, it means the integration of gender issues into the water agenda and its transformation so that it will better reflect gender concerns and needs. All gender perspectives, may they be differences in needs, uses, knowledge, skills and practices, access to resources, vulnerabilities and impacts, employment, entrepreneurship and position of influence, adaptation and mitigation capacity of women, men and non-binary persons, thus need to be fully integrated in water planning, implementation, management and decision-making. Gender issues need to be integrated in a cross-cutting manner into all policies and practices, and at the same time, broader factors, such as age, ethnicity, race, disability, sexual orientation, or any other personal circumstance that might lead to marginalization ought to be considered in parallel.¹³

In order to bring about this transformation, it is necessary to first conduct a **gender analysis** and to assess the implications of any planned actions, in order to evaluate if people of different genders benefit equally from them. A gender analysis provides knowledge to take specific action aiming to ensure that discrimination and thus inequalities will not be further maintained. It is paramount to collect **gender-disaggregated data** when assessing social and community information. Due to existing

¹⁰ EIGE. What is gender. <https://eige.europa.eu/thesaurus/terms/1141>

¹¹ EIGE. What is gender equality. <https://eige.europa.eu/thesaurus/terms/1168>

¹² EIGE. What is gender mainstreaming. <https://eige.europa.eu/gender-mainstreaming/what-is-gender-mainstreaming>

¹³ GWP and UNEP-DHI (2021). Advancing towards gender mainstreaming in water resources management. Global Water Partnership and UNEP-DHI Centre on Water and Environment. P. iv. <https://www.gwp.org/en/sdg6support/gender>

imbalances of power between genders, wherein men tend to hold more power and space, it might be necessary to conduct tailored qualitative analysis in order to obtain correct data.¹⁴

In case the gender analysis reveals unequal benefits from planned actions, **gender-specific activities and affirmative action** can be taken to combat consequences of existing norms and beliefs that perpetuate gender inequalities. Based on gender objectives and goals, designed in a participatory manner already in the planning stage of the project, **monitoring** needs to be carried out throughout the project to assess the achievement of set goals, which needs to be followed up with the **evaluation** of the gender impact. Gender mainstreaming demands additional time and expertise. To ensure gender aspects are integrated into a NBS, it is important to allocate resources to support gender aspects of the intervention, also known as **gender budgeting**.

2.1 Why mainstream gender into the environmental and water agenda?

The ultimate goal of mainstreaming gender into NBS is ensuring gender equality, but it is equally important that the process also contributes to the effectiveness, efficiency and sustainability of water management, NBS, as well as other approaches to resource management, as it ensures that the experience, knowledge, needs and interests of all are brought into the agenda.

The report entitled "Towards gender-responsive ecosystem-based adaptation: Why it is needed and how to get there"¹⁵ explains the rationale why mainstreaming gender into ecosystem-based adaptation (EbA) is necessary:

- Gendered roles and responsibilities: gender norms and stereotypes affect the expectations, roles and responsibilities of persons. For example women are largely responsible for water and sanitation and waste management at the household levels, while men are more involved in managing water and waste services. In addition to gendered roles, it is important to understand that such dynamics are determined by their specific context, and that there are other factors that need to be considered, such as age, ethnicity, race, gender identity, socio-economic status etc.
- Gender differences in access to and control over natural resources: Women are in numerous countries disadvantaged by both formal and informal laws about access to land, but also for other resources, such as fisheries and forests. There are also other norms, such as limitations to mobility, and consequences of norms, for example lack of funds or education, which additionally limit women's access to resources.
- Gender-specific knowledge: indigenous and traditional knowledge has important value to the conservation of ecosystems. It is often transferred from generation

¹⁴ Both ENDS (2996). Both ENDS Working Paper Series – November 2006. Effective gender mainstreaming in water management for sustainable livelihoods: From guidelines to practice. P.7. <https://eige.europa.eu/gender-mainstreaming/what-is-gender-mainstreaming>

¹⁵ Dazé, A. and Terton, A. (2021). Toward gender-responsive Ecosystem-based Adaptation: Why it's needed and how to get there. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), GmbH, Bonn, Germany.

to generation, to children of the same gender. This knowledge, as well as knowledge of women on traditional practices is often not valued in the same way as is male knowledge. In addition to the findings in the report, it is also important to note that while improving, gender discrimination is still very present in the fields of science, technology, engineering, and mathematics, and there is also an unbalance in the representation of different genders in scientific publications.¹⁶

- Imbalances in decision-making power: women are underrepresented in many sectors dealing with environmental issues, both when it comes to planning and taking decisions. This holds true for policy-making and actual work on the ground.
- Benefits of integrating gender: evidence suggests that including all genders leads to increases in effectiveness and sustainability in ecosystem-based processes and initiatives.

Whereas numerous international intergovernmental, research and nongovernmental organisations have been promoting gender mainstreaming into the environmental and water agendas for the past three decades, “advancing towards gender equality by fully recognising the important role of women and marginalised populations in water resources management remains a major challenge”.¹⁷ Gender mainstreaming is a time-consuming activity that requires additional financial and human resources, as well as commitment, not only at expert, but also decision-making levels. This is the case because it is about changing the traditional, accepted and expected ways of doing things. While having gender focal points is an important step to bring about gender mainstreaming, it is not a sufficient one, as all experts, professionals and researchers have to be aware about the nexus between resource management and gender, so that they can in the first place recognise in what manner gender matters in environmental issues, and based on the identified apply a gender sensitive lens to their work.¹⁸

3.0 GENDER, RESOURCE MANAGEMENT AND NBS

3.1 A social equity framework to explore potential synergies

The average water consumption of households in Europe in 2017 was estimated to be 147 litres/day/person. This number however differed not only between, but also within countries, and the differences can be prescribed to two main factors: the climate and income levels. Water use per household in 2017 thus varied from 112 to 159

¹⁶ Enago Academy (2019). Do LGBTQ Scientists Still Face Discrimination in Academia? <https://www.enago.com/academy/lgbtq-scientists-still-face-discrimination-in-academia/>

¹⁷ GWP and UNEP-DHI (2021). Advancing towards gender mainstreaming in water resources management. Global Water Partnership and UNEP-DHI Centre on Water and Environment. P. iii. <https://www.gwp.org/en/sdg6support/gender>

¹⁸ Ibid.

litres/day/person, with the highest values occurring in warm and/or high-income areas, and the lowest values in cool and/or low-income areas.¹⁹

There is a clear connection not only between water consumption, but other environmental issues, such as climate change or energy consumption, and the social dimension. The ways that individuals use, access and control natural resources depend on the structures, norms, values and power dynamics of the societies they live in. The amount of power that a person holds in the society is determined by their identity, which is constructed among others by gender, age, ethnicity, socio-economic and other personal circumstances and (dis)ability.

The Research Program on Forests, Trees and Agroforestry (CGIAR) explored the impact of mainstreaming gender into NBS and the creation of synergies between efforts to fight climate change, land degradation and biodiversity loss. The research focused both on the formation of social and environmental wellbeing. To understand the interconnectedness between gender and the environment, they used a social equity framework originally created by N. Fraser.²⁰ It focuses on three dimensions, which are ingrained in power relations:

- **Recognition:** different socio-cultural groups and identities have unequal experiences and rights, and some of them are discriminated based on their personal circumstances, such as gender, ethnicity or socio-economic status. The discrimination can further rise when several of these personal circumstances intercept. While recognising the existence of mentioned unequal opportunities is a goal in itself, it is also a necessary precondition to offer the marginalised groups the opportunity of having a voice in the decision-making process.
- **Representation and participation:** it refers to the actual enabling of marginalised groups to participate and influence the outcomes of decision-making processes. In order to ensure continued, consistent and long-term inclusion, it is important to dismantle institutionalised obstacles that prevent this from happening, which calls for a change of internalised values and norms.
- **Distribution:** the last step needed to ensure equity is a fair division of benefits and costs that arise from the solution, including the decision on how they will be delivered and allocated. The distribution should be negotiated and agreed upon in the decision-making process and it therefore depends on the first two pillars of recognition and allowing participation of all stakeholders.

¹⁹ European Environment Agency (2021). Water resources across Europe – confronting water stress: an updates assessment. EEA Report, No. 12/2021, p. 78

²⁰ Fraser, N (1998). Social justice in the age of identity politics: redistribution, recognition, participation. (Discussion Papers / Wissenschaftszentrum Berlin für Sozialforschung, Forschungsschwerpunkt Arbeitsmarkt und Beschäftigung, Abteilung Organisation und Beschäftigung, 98-108). Berlin: Wissenschaftszentrum Berlin für Sozialforschung GmbH). https://www.ssoar.info/ssoar/bitstream/handle/document/12624/ssoar-1998-fraser-social_justice_in_the_age.pdf?sequence=1

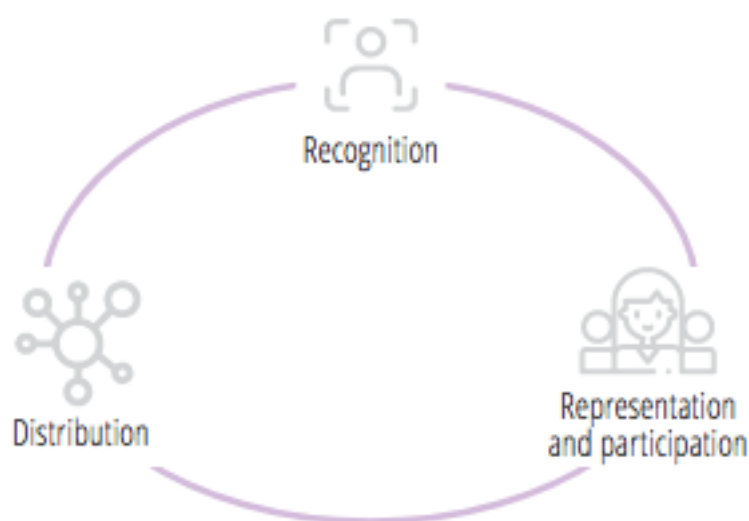


Figure 1: The social equity framework,
https://cgspace.cgiar.org/bitstream/handle/10568/114844/Enhancing_Elias2021.pdf?sequence=1&isAllowed=y

The three dimensions do not exist in vacuum, but are all embedded in their specific context, shaped by formal (laws, policies) and informal institutions (values, norms, unwritten laws). They determine the power relations within and between members of each group, may it be a community or a country, and it is the varying amount of power that they possess which influences their ability to gain their appropriate levels of recognition, participation and distribution of benefits and burdens.²¹

3.2 Gender mainstreaming for enhanced ecosystem services

Forest management

Collaborative forest management²² (CFM) is provided as an example of maximising both goals of sustainably managing forest resources while recognising the rights and maximising the benefits of persons that depend on the forests for their survival. At the centre of CFM are community forest user groups (CFUGs), which include representatives of the community involved in taking decisions. In India and Nepal, regulations have been adopted to ensure and increase women's participation in CFUGs. The results of effective CFM are multiple, such as the prevention of destructive practices and unregulated access to the forest, conservation and management of degraded forests, the combating of biodiversity loss and land degradation. When the gender lens is applied to CFM, they can also contribute to gender equality through amplifying women's voices and influence in forest governance and management, and enabling them access to forest resources and

²¹ Elias M; Ihalainen M; Monterroso I; Gallant B; Paez Valencia AM (2021). Enhancing synergies between gender equality and biodiversity, climate, and land degradation neutrality goals: Lessons from gender-responsive nature-based approaches. Bioversity International. Rome, Italy. p. 4 – 5.

²² Elias M; Ihalainen M; Monterroso I; Gallant B; Paez Valencia AM (2021). Enhancing synergies between gender equality and biodiversity, climate, and land degradation neutrality goals: Lessons from gender-responsive nature-based approaches. Bioversity International. Rome, Italy. p. 7.

thus securing livelihoods. At the same time, experience from India has shown that the inclusion of women in NBS has improved forest conditions, such as enhanced forest growth and the ability of forests to store carbon. In Nepal, women's participation has led to more cooperative and sustainable management practices that have also led to more forest-related earnings.

It would be wrong to assume, however, that CFM on its own automatically leads to equitable solutions, as power imbalances are also present within communities, favouring some members over others, especially those that have limited access to land, education and public influence. To tackle this challenge, approaches such as Adaptive Collaborative Management (ACM)²³ have been developed. It is based on the idea that the creation of knowledge-sharing and discussion spaces, which are facilitated in order to promote communication, collaboration and negotiation of diverse actors, supports effective participation in local resource governance. Participants range from CFUGs at the community level to district officials, and are involved in social learning, namely sharing their respective knowledge, experience, perspectives and values with the aim of jointly addressing and understanding shared issues, challenges and potential options. The role of ACM is to identify and address obstacles of various groups that would prevent them from taking part in the process. In the case of women, who are facing the burden of heavy workloads or debilitating social norms, the ACM approach could address this with adapting the meetings around women's schedules and in locations that they would be allowed to attend. It could also support mixed-gender dialogues, addressing gender issues, which in turn lead to women's empowerment.

Whereas it is very difficult to identify literature and research dealing with the intersection of gender and NBS or even broader environmental issues in countries of the Global North, studies reveal that social norms, values and stereotypes still play an important role in the United States (US) and Europe. The USDA National Woodland Owner Survey²⁴ shows that in 2011, 24 % of woodland owners were women, a rise from 19 % only 5 years prior to that. In 2013, 38 % of forest land in Sweden was owned by women, and 61 % by men. The governance of forests has traditionally been carried out by men or male-dominated organisations. The traditional stakeholders involved in the process have been public authorities, private forest owners and the forest industry, and in the past years environmental non-governmental organisations (NGOs) started taking part. In other words, there is no clear role for local perspectives in Swedish forest governance, and due to male dominance, women have in some local circumstances organised themselves separately and have created their own spaces for local forest management. Local perspectives and knowledge, indigenous people and their rights, as well as women therefore play an insignificant role both in Sweden's forest policy goals and in its international commitments²⁵.

²³ Elias M; Ihalainen M; Monterroso I; Gallant B; Paez Valencia AM (2021). Enhancing synergies between gender equality and biodiversity, climate, and land degradation neutrality goals: Lessons from gender-responsive nature-based approaches. Bioversity International. Rome, Italy. p. 8.

²⁴ Colfer, C.J.P., Sijapati Basnett, B. and Elias, M (eds) (2016). Gender and Forests: Climate Change, Tenure, Value Chains and Emerging Issues. Routledge. p. 36

²⁵ Colfer, C.J.P., Sijapati Basnett, B. and Elias, M (eds) (2016). Gender and Forests: Climate Change, Tenure, Value Chains and Emerging Issues. Routledge. p. 56 – 57.

A research²⁶, focusing on the value and management attitudes of forests among Swedish private owners, revealed that women tend to hold more environmental and human-centred management attitudes, while compared to men they value to a larger extent the recreational and ecological purpose of forests. Nevertheless, the Swedish policy goals fail to recognise the importance of including these diverse perspectives into the national forest policies. Instead, at their core is the generation of income from forest resources, the promotion of entrepreneurship in rural areas and of industrial forest production. The environmental and social dimensions are missing from the Swedish national policy. From the perspective of representation, women are not involved equally in the process, and when they are, it is not in their role as active citizens participating in forest policy making, but rather as employees and owners that work towards achieving the set economic goals.

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Climate change and agriculture

In natural disasters, women, girls and boys are 14 times more likely to die compared to men. They represented 70 % of fatalities in the 2004 tsunami in Southeast Asia, and 96 % of the victims in the 2014 Solomon Island floods.²⁸ While numerous studies on the intersection between natural disaster, climate change and gender have been undertaken in countries of the Global South, they are very scarce in Europe and further research needs to be undertaken to better understand the correlation. Research shows that the heat waves of 2002-03 that hit Europe affected the younger, elderly, sick and poor the most. It is therefore not surprising that the excess mortality rate in Portugal was more than twice the rate of men, whereas in France, excess mortality for women amounted to 70 %, and in men to 40 %.²⁹

Above mentioned are the direct effects of climate change, but there are additional consequences that can occur, such as decreased food security and adaptation capabilities due to lower incomes and larger caregiving and household chores of women. It is thus crucial that adaptation to climate change not only be transformative, but also gender sensitive. Unfortunately experience shows that climate change policies, projects and programmes often fail to be gender sensitive, and that adequate budget and technical expertise are not provided to mainstream gender, while women are often perceived within the vulnerability context instead of being seen as actors of change.³⁰

²⁶ Colfer, C.J.P., Sijapati Basnett, B. and Elias, M (eds) (2016). *Gender and Forests: Climate Change, Tenure, Value Chains and Emerging Issues*. Routledge. p. 60.

²⁷ Colfer, C.J.P., Sijapati Basnett, B. and Elias, M (eds) (2016). *Gender and Forests: Climate Change, Tenure, Value Chains and Emerging Issues*. Routledge. p. 65.

²⁸ FAO (2018). *Tackling climate change through rural women's empowerment*. p. 7. <https://www.fao.org/3/CA0178EN/ca0178en.pdf>

²⁹ EIGE (2012). *Review of the Implementation in the EU of area K of the Beijing Platform for Action: Women and the Environment. Gender Equality and Climate Change*. p. 7. <https://eige.europa.eu/sites/default/files/documents/Gender-Equality-and-Climate-Change-Report.pdf>

³⁰ FAO (2018). *Tackling climate change through rural women's empowerment*. p. 8. <https://www.fao.org/3/CA0178EN/ca0178en.pdf>

In particular, transformative adaptation to climate change in agriculture is defined as actions that achieve one or more of the following three goals³¹:

- Changing the geographical location to where specific types of livestock and crops and the systems that support the sustainability of production are secured;
- Changing the agricultural landscape;
- Usage of new methodologies and technologies in the existing area.

This approach, however, does not address the already existing inequalities, caused by the discriminating formal and informal laws and norms, which will only be exacerbated by climate change. Biophysical and technical solutions only cannot lead to progress on all three categories, namely the environmental, societal and economic. To combat socio-political and economic structures that perpetuate inequalities, it is necessary to address agency (capacity and confidence to act, existing skills), structure (formal and informal laws, institutions) and power relationships (especially within the household and community).³²

One of the good practices, presented in the paper written by CARE³³ on gender-transformative adaptation describes a climate smart village approach in Madhya Pradesh in India. The project first focused on attaining gender-disaggregated data about agricultural activities in the village, impacts and risks due to climate change, and socio-economic differences within households and the community. Based on the information, potential gender-transformative adaptation technologies were presented and discussed in smaller groups, which then chose 20 best options, such as improved access to better seeds, promotion of clean energy development, access to weather-based agro-advisory services etc. One of the impacts of the approach was higher farm yield, increased milk production and income. This led to diversification of consumed food and improved nutrition. Women not only became active participants in agricultural activities and decisions about them, but also got involved in other activities related to health, sanitation and nutrition.

Despite the differences between the Global North and South, T. Glazebrook, S. Noll and E. Opoku³⁴ claim that investing in women's agriculture would increase productivity and lead to more sustainable practices everywhere in the world. Whereas formally, land inheritance and ownership is gender-free, in reality land access in the US and Canada is often a tool to perpetuate systems of power, may it be in the form of racial segregation, patriarchal dominance or the consolidation of resources with those that already have the majority of power. Due to gender norms and stereotypes, men are perceived as farm owners, and women as farmer's wives, whose labour is ignored and seen as less valuable. Despite the trend of increased recognition of female farmers and their work, gender biases still constrain their work in numerous ways: the focus remains on male's

³¹ Deering, K (2019). Gender-Transformative Adaptation. From Good Practice to Better Policy. p. 5. https://careclimatechange.org/wp-content/uploads/2019/06/Gender-Transformative-Adaptation_Publication_FINAL.pdf

³² Deering, K (2019). Gender-Transformative Adaptation. From Good Practice to Better Policy. p. 7. https://careclimatechange.org/wp-content/uploads/2019/06/Gender-Transformative-Adaptation_Publication_FINAL.pdf

³³ Deering, K (2019). Gender-Transformative Adaptation. From Good Practice to Better Policy. p. 16. https://careclimatechange.org/wp-content/uploads/2019/06/Gender-Transformative-Adaptation_Publication_FINAL.pdf

³⁴ Glazebrook T, Noll S, Opoku E. Gender Matters: Climate Change, Gender Bias, and Women's Farming in the Global South and North (2020). *Agriculture*. 2020; 10(7):267. <https://doi.org/10.3390/agriculture10070267>

knowledge, even in areas where women are more active, such as organic farming; emphasis is on large-scale agriculture over approaches favoured by women; there is pressure from male farmers and agency staffers to adept management strategies that are not in accordance with female farmer's values and goals. Women farmers in the US earn 40 % less income than men, making this one of the more unequal professions.

Similar to women in the Global South, although not out of necessity, but as a matter of choice, women in agriculture in the US on average operate smaller farms, are more keen to engage in sustainable practices, including organic farming, and often engage in community supported agricultural practices, which contribute to the health of communities. T. Glazebrook, S. Noll and E. Opoku write about a clear gender bias in agriculture in the Global North, identifying it as "systemic and institutionalised discrimination"³⁵.

According to EIGE, women remain substantially under-represented in several key sectors, including agriculture in Europe. Changes need to be made at different levels in order to address the challenge, starting with addressing the data gap, but also contesting the current priorities, such as the economic growth paradigm, and giving more importance to public services and common welfare.³⁶ Responses to climate change relating to food and livelihood security in countries of the Global North remain in the domain of men through the creation of masculine jobs and spaces in industrial agriculture, carbon markets, and the green economy.³⁷

Globally it can be stated that while gender has been recognised as an important factor in climate change adaptation, there has not been a substantive move from rhetoric to practice. V. Nelson, K. Meadows, T. Cannon, J. Morton and A. M. Martin call the impact of climate change on gender relations "invisible" and in need of being further researched and acted upon.³⁸

Water

The United Nations world water report for 2018³⁹ refers to the following water and gender-related targets in the Sustainable Development Goals (SDGs):

- SDG1 – target 1.4: Ensure that all men and women, in particular the poor and vulnerable, have equal rights to economic resources, as well as access to basic resources...

³⁵ Glazebrook T, Noll S, Opoku E. Gender Matters: Climate Change, Gender Bias, and Women's Farming in the Global South and North (2020). *Agriculture*. 2020; 10(7):267. <https://doi.org/10.3390/agriculture10070267>

³⁶ Magnúsdóttir, G. L. and Kronsell, A. (2021). *Gender, Intersectionality and Climate Institutions in Industrialised States*. Routledge, New York.

³⁷ Resurrección, B.P., Bee, B.A., Dankelman, I., Park, C.M.Y, Halder, M., & McMullen, C.P. (2019). Gender-transformative climate change adaptation: advancing social equity. Background paper to the 2019 report of the Global Commission on Adaptation. Rotterdam and Washington, DC. p. 13. <https://gca.org/wp-content/uploads/2020/12/GenderTransformativeClimateChangeAdaptation.pdf>

³⁸ Nelson, V., Meadows, K., Cannon, T., Morton, J. and Martin, A. M. (2002). Uncertain predictions, invisible impacts, and the need to mainstream gender in climate change adaptation. *Gender & Development*, 10:2, 51-59. https://www.researchgate.net/publication/262953328_Uncertain_predictions_invisible_impacts_and_the_need_to_mainstream_gender_in_climate_change_adaptations

³⁹ UNESCO World water Assessment Programme (2018). The United Nations world water development report 2018: nature-based solutions for water. <https://www.unwater.org/publications/world-water-development-report-2018/>

- SDG6 – target 6.2: Achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations.

The report contains the mentioning of the impact of NBS, which is often most beneficial to the most disadvantaged and vulnerable, such as minority groups, rural inhabitants and women, also by reducing social inequalities. As an example of a holistic NBS approach it describes the green guide of the World Wildlife Fund entitled Natural and Nature-based Flood Management⁴⁰, which is, among others, based on the principle of strengthening resilience and improving livelihoods, as well as empowering women and other disadvantaged social groups. Gender is thus mainstreamed throughout the framework as a cross-cutting issue, for which a gender analysis needs to be conducted, gender-disaggregated data collected, and the budget has to be gender-responsive. This is important in order to take into account the differences in the impact of climate change and disasters both when preventing and when mitigating their consequences, since women are often more severely affected by them. Unlike in the UN World water report, where women are predominantly addressed as vulnerable persons, the WWF Guide recognises their role as agents for effective management of risk disaster. Unfortunately, when concentrating on the possible and advantageous role of the private sector in disaster risk reduction, it does not address the potential negative impact of public-private partnerships on gender equality and the thus needed mechanisms to counter-balance them.

Many parts of the world are faced with water scarcity and inadequate policies to tackle the challenge. Every year, 20 % of the European territory and 30 % of the European population are affected by water stress, which leads to 9 billion worth of economic damage, in addition to unqualified loss to ecosystems and their services.⁴¹ NBS are increasingly used to address water supply, with the aim of improving the location, timing and quantity of available water to meet the needs of the population.

A combination of low rainfall in 1985 and 1986 in Rajahstan, India, and excessive logging, led to the worst droughts in the state. One of the state's poorest districts, Alwar, was severely affected with its groundwater receding below critical levels. With the support of a local NGO, communities undertook landscape-scale restoration of local water resources and water cycles. Women led the efforts, as the responsibility of providing safe water is usually in their domain, and they were successful in reviving traditional initiatives for water through efforts aimed at management of forests and water resources. Small-scale water harvesting structures were built, forests and soil was regenerated to improve the recharge of groundwater resources. The activities resulted in a 6 metre rise of groundwater, water being brought back to 1000 villages, 5 rivers that continued flowing after the annual monsoon season, re-established fisheries in those rivers, an increase between 20 and 80 % of productive farmland, growth of crucial forest cover by 33 %, which helps maintaining the water-retaining capacity of the soil, and the return of wildlife to the area. While the example does not offer enough information about equitable

⁴⁰ World Wildlife Fund (2017). Natural and Nature-Based Flood Management: A Green Guide. https://files.worldwildlife.org/wwfcomprod/files/Publication/file/538k358t40_WWF_Flood_Green_Guide_FINAL.pdf?_ga=2.131354063.1520251400.1652266802-406863534.1652266802

⁴¹ European Environment Agency (2021). Water resources across Europe – confronting water stress: an updates assessment. EEA Report, No. 12/2021, p. 9.

distribution of costs and benefits, it is a good example of recognition of the marginalised groups and their inclusion into decision-making.⁴²

Due to an oversight of city and state officials in Flint, Michigan in the US, when switching the city's water supply from Detroit's water system to the city's local river in 2014 with the aim of saving money, lead trickled into the water supply for 18 months. The whole population of Flint, the majority of which is poor and Black, was affected by the pollution, however women and children suffered the most. Significant were the drop of fertility and the increase of fetal deaths. Women were not only severely affected, they were also the ones that were most active in dealing with the disaster. On one hand, they fought to ensure access to safe and affordable drinking water. This was done through a local grassroots civil rights group, founded in 2008 by five women of colour for water safety and accessibility, called "We the People of Detroit". In 2016, they delivered 125 tons of drinkable water to residents of Flint and Detroit. On the other hand, two other women were largely responsible for ensuring that the officials responsible for the mistake were held accountable.⁴³

Despite the perception that water and sewage infrastructures in the Global North allow for universal access to safe drinking water and sanitation, this is not the case. In the US, more than 2 million of the most vulnerable inhabitant, such as low-income people, people in rural areas, people of colour, indigenous people, women and immigrants, are not so fortunate. Race plays the most important role in determining access to water and sanitation; African-American and Latinx households are twice as likely to lack complete plumbing compared to a white household, while Native Americans are 19 times more likely not to have it. In addition to race, poverty is an additional barrier, and households with higher incomes are less likely to lack access to complete plumbing.⁴⁴ Women are thus much more likely not to have safe drinking water and sewage, as they represent more than 70 % of poor persons in the US, with single mothers suffering the most. The pay gap between men and women is 16 %. Black women, Native American and Latinas, as well as LGBTI and handicapped women are more likely to suffer from poverty.⁴⁵ An additional problem lies in the fact that no entity, neither a federal agency nor a research institute, collects data, let alone gender-disaggregated data, that would show the extent of the problem.

The United Nations world water development report 2019: leaving no one behind⁴⁶ addresses the existing gaps between countries and persons in the access of water and sanitation in general. It recognises numerous very relevant societal and social issues that need to be taken into account. Among them is the need to adapt all water facilities and services to the cultural context in which they are located, and to make them sensitive to gender, life cycle and other privacy requirements. In order to promote universal rights,

⁴² UNESCO World water Assessment Programme (2018). The United Nations world water development report 2018: nature-based solutions for water. p. 52

⁴³ Women's media centre (2017). New study shows women bore brunt of Flint water crisis, but they've also led fight against it. <https://womensmediacenter.com/news-features/new-study-shows-women-bore-brunt-of-flint-water-crisis-but-theyve-also-led-fight-against-it>

⁴⁴ US Water Alliance (2019). Closing the Water Access Gap in the United States. A National Action Plan. http://uswateralliance.org/sites/uswateralliance.org/files/Closing%20the%20Water%20Access%20Gap%20in%20the%20United%20States_DIGITAL.pdf

⁴⁵ The Center for American Progress (2020). The Basic Facts About Women in Poverty. <https://www.americanprogress.org/article/basic-facts-women-poverty/>

⁴⁶ UNESCO World Water Assessment Programme (2019). The United Nations world water development report 2019: leaving no one behind. <https://unesdoc.unesco.org/ark:/48223/pf0000367306>

it is necessary to learn about and understand the existing structural inequalities and discrimination between and within groups, which cannot be made possible without gathering gender-disaggregated data. While gaining this knowledge, it must be understood that gender-based inequalities can be and usually are exacerbated with other circumstances that are also perceived as grounds for discrimination, such as disability, gender, sexual orientation, poverty, life in rural areas, imprisonment, and homelessness.

Urban green space

B. Sowinska-Swierkosz, M. Michalik-Sniezek and A. Bieske-Matejak⁴⁷ write about three main aspects that have been researched about the intersection of social issues and urban space: social benefits and costs, including environmental justice, stakeholder participation and their opportunities and challenges in doing so, and social perceptions about green solutions. Many positive co-benefits of NBS on the society have been identified, among them social cohesion, community support, improvement of physical and mental health, attractive green spaces and new green jobs. Social costs have also been noted, such as inequalities in accessing NBS, increased prices of land and rent, increased number of mosquitoes and allergenic pollen and more pollution, for example from falling trees in the autumn. It is interesting that analysis tend to focus to a larger extent on benefits compared to costs. The researchers conclude that the nexus of NBS and gender issues has not yet been thoroughly investigated, and that it is currently limited to gendered health benefits and perceptions of the value of NBS. However, recent literature to a larger extent promotes the need to include local and indigenous knowledge in all project stages.

In the paper entitled “The Contribution of Nature-Based Solutions to Socially Inclusive Urban Development – Some Reflections from a Social-environmental Perspective”⁴⁸, A. Haas argues that while the EU policy documents expect that NBS provide solutions to various societal problems in cities, they do not address the fact that there is not one, but numerous differentiated urban societies nor do they tackle the existence of social and power structures within cities. In addition, the possibility that NBS might not lead to equally beneficial impacts for all population groups is not considered, and it remains unclear whether NBS automatically lead to socially just and inclusive developments.

A. Haas⁴⁹ argues that in order to ensure social benefits, a deliberate consideration of already existing inequalities and consequently unequal opportunity to gain access to those benefits, as part of the social and power structures within the city, needs to be part of NBS. These inequalities then need to be counterbalanced to ensure that participatory consultations include the precarious groups, such as the poor, migrants, minorities, unemployed and alternative subcultures. If not, NBS can on one hand lead to favouring high profile developments over providing green and blue services to the broader public, and on the other hand they can lead to gentrification of treated areas,

⁴⁷ Sowińska-Świerkosz B, Michalik-Śniezek M, Bieske-Matejak A (2021). Can Allotment Gardens (AGs) Be Considered an Example of Nature-Based Solutions (NBS) Based on the Use of Historical Green Infrastructure? *Sustainability*. 2021; 13(2):835. <https://doi.org/10.3390/su13020835>

⁴⁸ Kabisch, N. et al. (eds.) (2020), Nature-based Solutions to Climate Change Adaptation in Urban Areas, Theory and Practice of Urban Sustainability Transitions, DOI 10.1007/978-3-319-56091-5_13

⁴⁹ Ibid.

while further degradation occurs in poorer areas, as they become more densely populated due to higher rents in the new green parts of town. It is thus very important for NBS to be considered holistically, and not as an isolated solution taking place in a small section of the city.

An example of an urban NBS that takes into consideration the social, economic and environmental perspectives, while operating in a bottom-up manner and through a gender sensitive lens, can be found in Edinburg, Scotland. One of the challenges that women face in the country relates to their economic empowerment. Compared to men, they are more likely to find themselves in insecure employment, have lower incomes due to the pay gap, and are more often the sole caregivers for children or elderly relatives. This reduced economic stability also influences their adaptation capabilities to climate change. For example, it is more difficult for them to afford healthy, sufficient and nutritious food as prices rise, to avoid energy poverty or climate proof their homes⁵⁰.

The Lauriston Farm⁵¹ is an Agroecology Co-op project in Edinburgh still being developed. The farm stretches over 100 acres of municipal land, leased for 25 years. There are three areas of focus: food growing, biodiversity and community. A third of the area will not be accessible to persons, as it is intended for habitat enhancement. Part of the farm is reserved for growing local, affordable and fresh produce that will also generate an economic yield, and in addition the project offers opportunities to learn about food growing and biodiversity. In the longer run, the aim is to support other micro enterprises in land based work. It is a collaborative place that stems from the needs of the involved communities and groups, gathered through a consultative process. It recognises the need to include all members of the community, and through consultations aimed at co-creating the project also ensures their participation in decision-making. This process also allows for joint decisions about sharing the burdens and benefits of the project.

FEMPUBLICBCN⁵² is an example of a research project, focusing on the nexus between the perception and uses of public space, gentrification, Covid-19 and health of women, non-binary and trans people. The quantitative data collection is based on street intercept surveys in two neighbourhoods, impacted by gentrification and touristification. Based on observation, more male-presenting persons use the public spaces for relaxation purposes, while female-presenting persons use the space to carry out care work, such as taking care of elderly, children or running errands, pointing to the existence of gendered roles. An important element of the project is ensuring that gender-nonconforming persons are approached in a sensitive manner in public space and that their voices are heard. In order to do so, researchers had to challenge their own perceptions of gender. Unfortunately recruiting non-binary and trans persons turned out to be difficult, as they are underrepresented in public space.

⁵⁰ Scottish Wildlife Trust. How nature-based solutions can help boost gender equality. <https://scottishwildlifetrust.org.uk/2021/11/how-nature-based-solutions-can-help-boost-gender-equality/>

⁵¹ <https://www.lauristonfarm.scot/about>

⁵² FEMPUBLICBCN. Strengthening the impact of public space to improve health and wellbeing in Barcelona: an intersectional feminist approach. <https://www.bcnej.org/projects/fempublihcnc/>

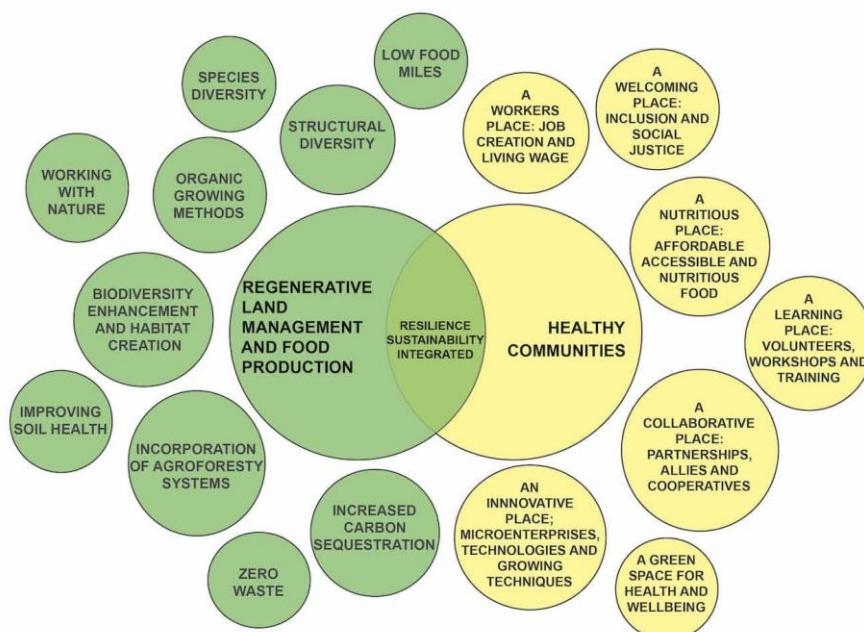


Figure 2: The aims and approaches of Lauriston farm, <https://www.lauristonfarm.scot/project>

As seen in Figure 2, inclusion and social justice is one of the aims of the project, which is led by women. Spaces are created that allow for the exchange of knowledge, experience and needs of all community members, which provide opportunities and influence also for those that due to systemic reasons hold less power and are thus marginalised in the community, among which are also women.

4.0 GENDER MAINSTREAMING TOOLS

As already stated, there have been increasing calls about the importance of socially inclusive and gender sensitive management of natural resources, including water. Several tools have thus been created for researchers, practitioners, project managers, donors and evaluators working in the field of resource management, with the aim of showing the importance of mainstreaming gender into their work and providing guidance with which this goal can be achieved.

A methodological approach for inclusive participation of all stakeholders with a gender perspective will be developed within MULTISOURCE, so this chapter will not analyse the guidelines in much detail, but will rather focus on their common recommendations for mainstreaming gender at the operational level. The contents of the following documents have been analysed: Why Gender Matters in IWRM: A tutorial for water managers⁵³, Towards Gender-Responsive Ecosystem-Based Adaptation: Why it is needed and how to

⁵³ Gender and Water Alliance (2014). Why Gender Matters in IWRM: A tutorial for water managers. http://genderandwater.org/en/gwa-products/capacity-building/tutorial-for-water-managers-why-gender-matters/tutorial-for-water-managers-popular-version/tutorial-for-water-managers-why-gender-matters-mid-resolution/at_download/file

get there⁵⁴, Enhancing synergies between gender equality and biodiversity, climate, and land degradation neutrality goals⁵⁵ and Gender in irrigation learning and improvement tool⁵⁶. The methodological approaches differ between the toolkits, but they all focus on the following necessary steps for ensuring gender equality:

- **Gender analysis:** this is the first and necessary step to ensure a gender-responsive approach. It provides the information about the roles and opportunities of people of different genders, the dynamics between them, and their respective power to make decisions. In order to obtain relevant information, data collected needs to be disaggregated by gender, but also by other personal circumstances (for example age, socio-economic status, ethnicity and gender identity). Based on the obtained information, gender-specific targeted actions can be devised.
- **Inclusion of marginalised groups in the planning stage:** when planning project activities, a transparent and inclusive process needs to take place, in which the opinions of all stakeholders of different genders will be collected, consideration needs to be given to other personal circumstances as well. Opportunities need to be created that will allow for this to happen, such as consultations separated by gender or adapting to limitations due to gendered roles, not only ensuring the inclusion of marginalised group, but their active voicing of opinions.
- **Gender equitable and inclusive structure in the implementation stage:** structures need to be put in place, which ensure safe spaces for individuals of all genders to continue voicing their interests, as well as contribute their skills and know-how. These spaces can with time start deconstructing, challenging and reshaping gender norms and stereotypes, which can in turn lead to changes in informal and formal laws.
- **Gender-sensitive monitoring and evaluation:** in an ideal situation, there would be equal division of benefits and costs between all genders. The role of monitoring is to assess whether this is the case throughout the project and if not, whether a different strategy would be needed to ensure that. In case the evaluation shows the efforts were not successful in ensuring gender equality, shortcomings need to be identified. Once again, gender-disaggregated data is necessary in this respect.
- **Gender-sensitive budget:** to carry out all of the above steps, resources need to be set aside so that gender issues can be addressed. In all stages it is important to use communication channels that reach all genders, as well as shape the messages in such a way to ensure equitable participation of all.

⁵⁴ Dazé, A. and Terton, A. (2021). Toward gender-responsive Ecosystem-based Adaptation: Why it's needed and how to get there. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), GmbH, Bonn, Germany. p. 227 – 233.

⁵⁵ Elias M; Ihalainen M; Monterroso I; Gallant B; Paez Valencia AM (2021). Enhancing synergies between gender equality and biodiversity, climate, and land degradation neutrality goals: Lessons from gender-responsive nature-based approaches. Bioversity International. Rome, Italy.

⁵⁶ Lefore, N, Weight, E and Rubin, D. (2017). Gender in irrigation learning and improvement tool. Colombo, Sri Lanka: International Water Management Institute (IWMI). CGIAR Research Program on Water, Land and Ecosystems (WLE).

5.0 CONCLUSION

The original intention of this paper was to provide an overview of the existing literature on the nexus between gender, NBS and water management. Very little is written on this intersection, and practically all of the information focuses on countries of the Global South. This indicates the perception that gender no longer plays a role in ecosystem services in countries of the Global North, even though gender equality has not been reached in any country in the world, and it has further deepened in the past two years due to the COVID-19 pandemic.

Even though a broader international perspective is part of MULTISOURCE, its focus and all of its pilot projects on NBS^{WT} are on countries of the Global North. Due to the small amount of existing evidence on the researched nexus in these countries, this paper aims not only at reflecting the existing evidence on the importance of mainstreaming gender into NBS in countries of the Global South, as they are often perceived as not relevant to the MULTISOURCE context, but also to show that there is a need for further investigation on the nexus in parallel to active gender mainstreaming into NBS in the Global North as well.

Research has shown that despite a very holistic definition of NBS, in practice they are too often top-down tools and technologies that are applied to tackle an environmental problem that is causing societal challenges. But to truly ensure that they simultaneously provide both well-being and biodiversity benefits, NBS have to be improved as an approach.⁵⁷ According to A. Haas, the methodology needs to become more holistic, both from the perspective of seeing a bigger picture rather than the isolated challenge, and from the point of view of searching for synergies between the economic, social and environmental perspectives. Debates between environmentalists and social experts need to be strengthened, both at operational, research and policy levels, while the recognition, inclusion and consideration of all stakeholders at the operational level has to become part of all NBS.

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The overall goal of MULTISOURCE is to, together with local, national, and international stakeholders, demonstrate a variety of about Enhanced Natural Treatment Solutions (ENTS) treating a wide range of urban waters and to develop innovative tools, methods, and business models that support citywide planning and long-term operations and maintenance of nature-based solutions for water treatment, storage, and reuse in urban areas worldwide. The project includes seven pilots treating a wide range of urban waters. Two individual municipalities (Girona, Spain; Oslo, Norway), two metropolitan municipalities (Lyon, France; Milan, Italy), and international partners in Brazil, Vietnam, and the USA will contribute to each of the main project activities: ENTS pilots, risk assessment, business models, technology selection, and the MULTISOURCE Planning Platform. The use of urban archetypes in the Planning Platform will enable users to quickly classify regions (in both developed or developing countries) suitable for the application of nature-based solutions for water treatment (NBSWT) and compare scenarios both with and without NBSWT.



MULTISOURCE
enhanced natural treatment solutions



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