

WOMEN IN WATER ITALY Pre-Print Paper

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Gender and water in Italy: women's roles in water decision-making – Preliminary review and research framework

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Abstract

This study explores women's participation in Italy's water sector – science, agriculture, policy, and water governance- addressing a critical gap in national research on gender and water governance. Anchored in feminist Political Ecology, intersectionality issues, and gendered institutions theory, it applies the UNESCO World Water Assessment Programme (WWAP) gender-responsive sex-disaggregated indicators to the Italian context for the first time. The preliminary literature reveals persistent gender disparities in the realm of technical professions, decision-making, and policy influence, compounded and exacerbated by regional inequalities and entrenched gender norms of the country. By operationalizing UNESCO WWAP indicators, the study not only contributes to the creation of a methodology but also to the provision of a first questionnaire in order to allow the production of empirical insights into Italy's gender-water nexus. The paper also offers methodological guidance for integrating gender perspectives into national water policy. This preliminary study provides a foundation for evidence-based interventions that address structural barriers, promote capacity-building, and strengthen institutional accountability in line with European Union (EU) directives and stemming from the UNESCO-led international "Call for Action for the Advancement of Gender Studies and Promotion of Women in the Water Sector". This research builds on the University of Bergamo participation in the WWAP Coalition for "Accelerating Gender Equality in the Water Domain" and it is funded by the EU-Marie Skłodowska Curie Action "JustWATER".

1. Introduction

This paper presents the preliminary literature and a scoping study regarding the method to investigate the presence (or not) of gender disparities in Italy's water sector and the presence or absence of inclusive gender-related policies for sustainable water governance. Key findings will eventually disclose whether the cultural norms of the country, its policy gaps, and lack of representation presented in the 2023 general statistics of the European Gender Equality Index for the country are also hindering women's participation in the water sector of Italy.

Despite the fact that the final results of this enquiry will be ready in more than a half year's time, it is already clear from current existing literature that any future research should focus on extensive sex-disaggregated data and that more studies are needed to assess the impact of European and Italian gender policies in the water sector of Italy and explore intersectional dimensions of gender and water governance in the country.

Historically, water management has been a male-dominated field, populated by what Francois Molle used to call "hydro-bureaucrats", with women encountering substantial obstacles to participation and leadership (Molle et al., 2009). Notwithstanding progress in gender equality initiatives and acknowledgement of women's contributions to sustainable water management, gender inequality endures in governance, technical positions, and decision-making processes, the matter of gender equity in the water sector is especially pertinent. Obstacles including gendered labour division, inequitable resource and access to training and education (Botella et al. 2019), together with, for example, cultural prejudices, still hinder and impede the effective integration of women in the water sector (Sehring et al. 2022).

This paper examines women's involvement in Italy's water sector, with a focus on science, agriculture, policy, and decision-making. The inquiry is situated within the frameworks of feminist Political Ecology (Rocheleau 1995), intersectionality (Crenshaw, 2013), and theories of gendered institutions (Acker, 1992), which provide conceptual tools for understanding how power, agency, and representation are shaped in environmental governance. Feminist Political Ecology allows us to unpack how gendered power relations influence water access, use, and control, while intersectionality issues and literature help recognize how overlapping identities (e.g. class, geography, ethnicity, and/or age) produce complex inequalities (Zwartveen 2017). Gendered institutions theory sheds light on how structural norms and practices reproduce disparities in water-related professions and governance spaces.

Using the UNESCO WWAP gender-responsive tools and sex-disaggregated indicators – applied for the first time in Italy – the study aims to generate empirical evidence on gender disparities, consider regional inequalities, and situate Italy within the European and international context. The study entails preliminary work on a literature review and a tailored made methodology for the Italian case. The analysis of precedent literature reveals that the country (despite measurable progress in gender equality) has considerable gaps in leadership representation and gender-responsive policy implementation. This hinders the achievement of Sustainable Development Goal (SDG) 5 (gender equality) and SDG 6 (clean water and sanitation).

Anchored in the UNESCO WWAP methodology for gender-responsive water assessment, previously applied in Argentina (Imburgia et al., 2020), the study adapts and operationalizes these indicators for the Italian context. This approach enables the generation of empirical evidence on gender disparities in Italy's water sector, facilitating evidence-based policy recommendations. Comparative and longitudinal dimensions will be considered in the assessment of results, in order to assess shifts over time and contextualize Italy within the broader EU and international framework.

The research is timely: Italy, a high-income EU member state, has made measurable progress in gender equality according to the European Institute for Gender Equality (EIGE, 2024), yet gaps remain in leadership representation and gender-responsive policy implementation, particularly in water governance. Addressing these gaps is essential for meeting SDG 5 (gender equality) and SDG 6 (clean water and sanitation).

The paper follows the subsequent structure of literature review and theoretical framework, methodology, preliminary findings, and recommendations for future research. Section 2 provides a literature review and theoretical framework, examining gender and water studies in Italy and internationally. Section 3 outlines the methodology presented for data collection and analysis. Section 4 offers preliminary conclusions and an outline for future research directions.

2. Literature review and theoretical framework

This section reviews international and Italian scholarship on gender and water, outlines the theoretical frameworks guiding this study, and situates the Italian case within broader policy and sociocultural contexts. It responds directly to the need to ground the inquiry in robust gender theory and to strengthen the literature base with recent and relevant references.

The study draws on three interrelated theoretical perspectives:

1) Feminist Political Ecology – which examines how gendered power relations shape access to and control over natural resources (Rocheleau 1995), including water in this perspective. It highlights how decision-making, policy formation, and everyday practices in the water sector are embedded in systems of inequality.

2) Intersectionality studies – which acknowledges that gender interacts with other social identities (e.g. class, ethnicity, age, religion) to produce complex, overlapping forms of disadvantage (Crenshaw, 2013). This is critical in Italy, where regional disparities between North and South intersect with gender gaps in employment and leadership.

3) Gendered Institutions Theory – which explains how institutional norms and structures reproduce inequality, even in the absence of overt discrimination (Acker, 1992).

These perspectives guide the operationalization of the UNESCO WWAP gender-responsive indicators (Miletto et al., 2019) to the Italian context, allowing for a nuanced analysis of both participation and empowerment. This paper will thus provide a discussion of the literature that contributes to an understanding of the situation of gender and water issues in Italy and how best to approach an investigation. More specifically, this session will include a presentation of: 1) a description of the sociocultural, policy and legislative environments that inform an understanding of the issues linked to gender and water in Italy; 2) the theoretical perspectives that elucidate the problematisation of the issue of gender and water in Italy; 3) an introduction to the conceptual frameworks that will be used for and during the process of investigation, leading to the methodological section.

This paper is part of a larger research project called “JustWATER”, aimed at exploring virtual water export from vulnerable aquifers and drought-prone water bodies in Italy, with the scope of providing policy-oriented tools to improve hydropolitics in Italy. The project, funded by the Marie Skłodowska-Curie Action “Post Doctoral Fellowship”, is currently hosted by the University of Bergamo. In particular, this specific section of the research project was developed to address the need for empirical water and gender information in the water sector at all levels: academia, research institutes, non-governmental organizations (NGOs), grassroots organizations, farmers and water resources governance bodies in Italy.

The research question: this paper employs the methodology already tested for Argentina (Imburgia et al.2020) to investigate a critical question: is there statistical evidence of gender disparities in agriculture, water decision-making, water politics, water science (enrolment and graduation in university programs) pertaining to water resources management in Italy?

As already mentioned, the intersection of gender and water management has been extensively studied at the international level (Sehring et al 2022), with research indicating that women play a crucial role in water collection, conservation, and governance at the community level with decreasing roles of power at the intermediate, regional and national level (Greco 2025). However, a more accurate country-based enquiry is needed for Italy in order to disentangle numbers, when available, and identify missing data. This explains the relevance of the introductory literature for this Italian study

2.1 The global context: gender and water, an overview

The 2019 UN Women's Progress of the World's Women 2019-2020 report acknowledges the insufficient advancement in gender equality regarding women's access, participation, and decision-making in the global water sector (UN Women, 2019).

Globally, comprehensive gender-disaggregated data is scarce, and its absence hampers effective policymaking (UNESCO WWAP, 2021). The literature consistently calls for improved methodologies for collecting and analysing sex-disaggregated water data, alongside context-sensitive policy interventions (Zwarteveen, 2017).

Gender equality and women's empowerment have advanced at an unprecedented rate in the majority of development areas since the Beijing Declaration and Platform for Action (BDPfA) was introduced in 1995. Enhanced awareness and comprehension of women's rights, along with the necessity to surmount traditional constraints and discrimination against women, have fertilized all sectors of society. However, this social advancement has not been adequately integrated into the water management sector, as a general conclusion (Zwarteveen, 2017).

Moreover, there is an acknowledged global necessity to enhance the capabilities of national water officials and researchers in the accurate collection and analysis of gender-responsive water data (UNESCO WWAP, 2021). Comprehensive water and gender data are essential for shaping water policies and governance strategies, as they facilitate detailed analyses and the recognition of the interconnections among various environmental and social factors related to water (Miletto et al., 2019). This study in Italy reveals a deficiency in the availability of water data categorised by gender, alongside a minimal utilisation of existing sex-disaggregated methodological tools and gender statistics.

2.2 Women in the water sector in Italy: policy and legislative frameworks

This paragraph includes a description of the background context, relevant data and information regarding the geographic location under study, as well as descriptions of initiatives and projects which the author deems relevant for the study of gender and water in Italy.

Italy's water governance is shaped by EU directives such as the Water Framework Directive (2000/60/EC) and different national environmental laws. While the European framework provides a baseline, national implementation has been uneven, with limited citizen and stakeholder participation in water decision-making (EC, 2019). Sex-disaggregated water data is virtually absent in national statistics, and existing methodological tools remain underutilized, despite the existence of the European Gender Equality Strategy 2020–2025.

The Italian Gender Equality Index (EIGE, 2024) shows progress in education and health but persistent gaps in employment and decision-making. Women occupy 32.3% of seats in parliament and hold less than 40% of senior civil service roles (UN Women, 2024; Global Government Forum, 2022). These gaps are magnified in the water sector, where no comprehensive data exists.

Concerning gender equality in water management, both the European Water Framework Directive (2000/60/EC) and the European Gender Equality Strategy 2020–2025 established a basis for advancing gender parity in water governance. National policies, however, still show implementation deficiencies, due to the lack of participation in water decision-making by citizens, as lamented in the latest EU report (EIGE 2024).

Italy is a member of the OECD, a high-income nation, and a unitary parliamentary republic with an estimated population of 59.5 million as of 2023 (WHO, 2023).

The gender ratio is approximately 95 males for every 100 females (GlobalData, n.d.). From 2005 to 2017, Italy's score rose by 3.8 points. Italy is advancing towards gender equality more rapidly than other EU Member States. Its ranking has ascended by 12 positions since 2005.

The European Institute for Gender Equality (EIGE) reported that Italy achieved a score of 63.0 out of 100 in the 2024 Gender Equality Index, placing it 14th among EU nations (EIGE, 2024). This signifies advancement in gender equality, although obstacles persist.

The employment rate for women aged 20–64 in the labour market is 53%, while for men it is a 20% more, ranking up to 73% (EIGE, 2019). This disparity shows persistent gender disparities in the workforce.

As of February 2024, women occupied 32.3% of seats in the Italian parliament (UN Women, 2024). In the civil service, women hold between 32.0% and 38.0% of senior positions, positioning Italy in the median range among G20 nations (Global Government Forum, 2022). Italy is one of only two G20 nations to experience a reduction in the percentage of women occupying senior civil service roles in recent years (Global Government Forum, 2022).

These statistics highlight the necessity for ongoing initiatives to tackle gender disparities in Italy, especially in leadership positions within government and the workforce.

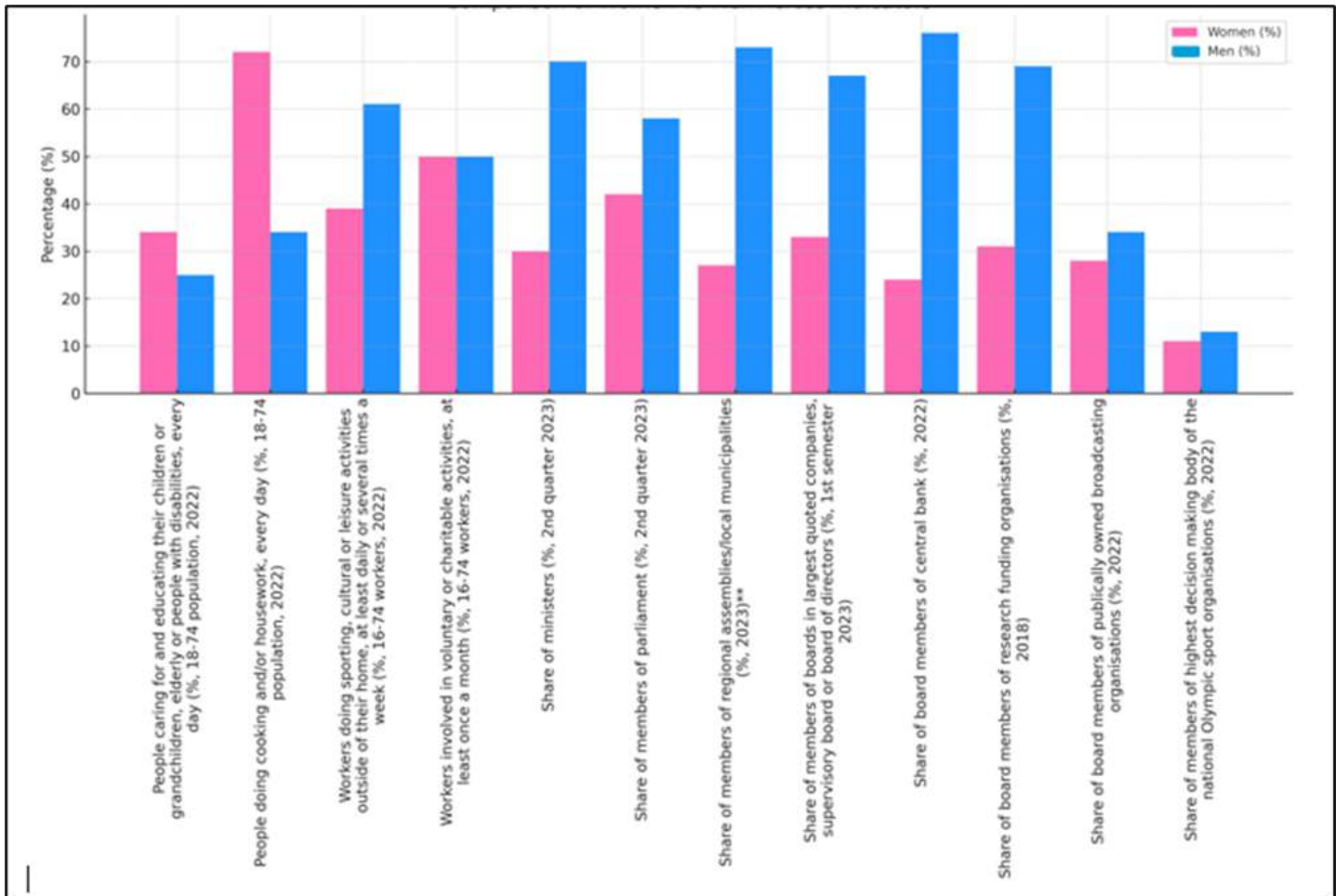
On top of all the above structural problematics, the pandemic profoundly impacted Italy in terms of health, employment, and economic stability: 158,700 deaths as of March 26, 2022 (Italian Civil Protection Department, 2022), a Gross Domestic Product contraction of -18.2% in the second quarter of 2020 compared to 2015 (ISTAT, 2023), significant job losses, and a rise in the poverty rate. This has had a huge impact on women's condition, in terms of job losses (ISTAT 2023).

2.3 Sociocultural dimensions: the sociocultural context of gender stereotypes in Italy and the Gender Equality Index of the Nation

Gender stereotypes remain pervasive in Italy (Silva et al., 2024), shaping perceptions of women's roles in technical and leadership domains, including water governance. Regional divides exacerbate these disparities, with the South exhibiting more entrenched norms and lower women's political participation and representation rates. The results of the study unequivocally indicate that gender stereotypes remain pervasive in Italy across all sectors of society. (Silva et al. 2024). Furthermore, specific cohorts of women, including those from minority backgrounds, individuals with disabilities, members of lower social class or economically disadvantaged groups, migrants, and foreigners, may experience a disproportionate adverse impact from gender stereotypes when these are compounded by intersecting stereotypes. This will enhance the probability of experiencing loneliness and isolation, while simultaneously diminishing their capacity to articulate their self-identity. (Silva et al., 2024).

According to the European Union Gender Equality Index (EIGE, 2024) -see Figure 1- in Italy there is a 38% likelihood of more women doing housework or cooking every day, as compared to men. Additionally, 51% of women have experienced sexual harassment and within parliament, only 32.3% of MPs are women. Moreover, according to the same report, Italy's sociocultural landscape influences gender roles in all sectors, and this research will explore whether this is valid and applicable to the water sector as well. Traditional gender norms often restrict women's participation in technical and leadership roles. The report finally shows how regional disparities further exacerbate these challenges, with southern regions facing more pronounced gender gaps as compared to the northern regions.

Figure 1: Graph: Percentage of women and men in performances regarding time allocation in daily life and access to power



Source: Elaboration by the author, based on EIGE (2024).

2.4 Gaps in academic literature: gender and water in Italy, a complete unknown

English-language scholarship on gender and water in Italy is minimal. Key works on water law and governance (Guerrini and Romano, 2014; Turrini et al., 2021) make no mention of gender. Notable exceptions include grassroots analyses (Balzametti et al., 2012, Caprini 2012) and sector-specific case studies linking gender to environmental hazards (Salvati et al., 2015). These studies underscore the need for systematic investigation using established gender-responsive indicators.

The book *Water Management in Italy: Governance, performance and sustainability* returns zero results when searching the entire manuscript for the word “women”. Same for the word “gender”. (Guerrini and Romano, 2014). The 2021 volume *Water Law, Policy and Economics in Italy* returns the same results (Turrini et al., 2021).

At present, English-based academic literature seems blind to the topic of gender and water in Italy, despite the establishment of the “gender and water” link in international water literature much earlier in time, dating back to the 1970s.

The only English paper mentioning gender, when discussing the human right to water in Italy, states that “Water has to contribute to the strengthening of solidarity among peoples, countries, genders, and generations” without mentioning the term “gender” again in the whole text and scoring “zero” in the word search for “women”, thus, failing to discuss and address the topic on its (quasi) totality a part from the title(Armeni, 2008).

Only recently, the factor of gender was taken into account, together with other factors (age and circumstances) in a detailed account of floods and landslides during the 50-year period between 1965 and 2014 (Salvati et al., 2015). This paper is particularly timely, as Italy is currently in the aftermath of heavy flooding and landslides that have happened in the last ten years. Salvati and colleagues align with international literature on water-related disasters, where intersectionality links of gender, class, ethnicity and other factors are usually performed.

Exploring the Italian literature on the topic (Zanotelli 2012) , the grassroots movements for “Acqua Bene Comune” were the first to publish a paper discussing the role of women in water politics. This was in the framework of the campaign for the Italian referendum for a public management of water in 2011(Balzametti et al., 2012).

The topic of women and particularly mothers, is currently addressed by the same grassroots movements and in particular by the organization “Mamme contro i PFAS”(*“mothers against PFAS”- editor’s translation in English*) , when addressing water pollution and related threats to public health (Padoan, 2022)

2.5 Good practices and emerging initiatives, success stories in Italy in the sector of women in water management

Isolated initiatives, such as the “Women of the Water” network by the Tavolo Nazionale dei Contratti di Fiume (TNCdF) and “Confagricoltura Donna,” demonstrate pathways for women’s empowerment in agriculture-linked water management. However, their potential remains untapped due to limited integration into national water policy(Confagricoltura 2023). Each of these cases is directly connected to water resources via irrigation rights, flood adaptation, and sustainable agriculture practices. Below is an overview of the significance of these success stories, suggesting the potential creation of a pattern of good practices.

The National Campaign “Women of the Water” (“le donne dell’acqua” in Italian) promoted by the TNCdf aims to create pathways for women’s empowerment to enhance the contribution of women with their innovations (in production, technology and business organization) to water resource management, combating climate change, agro-ecology, circular economy and sustainable cultural tourism, linked to some workplaces that symbolically represent the first forms of women’s participation and aggregation. For example, ancient wash houses, river bends where hemp and broom were worked, rice fields, and women’s work in other fields or mountain areas. All this aims to establish a national network of women of water.

Moreover in June 2023, at the “Women United for Water” event held in Rome, Alessandra Oddi Baglioni (president of Confagricoltura Donna) declared:

We want to enshrine the will of women’s associations of four pivotal agricultural sectors: wine, oil, fruit and vegetables, and rice to unite to square off and address the problem of climate change. Droughts and floods are sides of the same coin. We have come together precisely to propose, following territorial and productive needs, a united document that we will present to the institutions.

Alessandra Oddi Baglioni

(Confagricoltura 2023)

The points Baglioni raised, were shared by other women and their specific request revolved around climate change and water-related disasters and threats in agriculture, including irrigation extension rights and the problem of their unaccounted-for labour and working hours in their small and usually family-owned Italian farms. More specifically, their report clearly assessed some gender-based agricultural statistics, as the following:

Donne&Riso (*Women&Rice, author’s translation*) – Italian rice farming is the first in Europe with about 55% of rice production. There are 10,000 workers engaged in rice cultivation, and 95% are concentrated in Piedmont and Lombardy. Piedmont is the leading producing region. About 20% of the 3,600 rice farms are led by women and for the remaining percentage the active women figure is growing strongly. The rice entrepreneur’s family is increasingly enriched with women, daughters or wives directly involved in production or processing activities. “Donne&Riso” advocates the need for the promotion of a product to go hand-in-hand with that of its territory.

Donne dell’Olio (*Women of oil, authors’ English translation*)– For oil, farms led by women are about 30% of the total, but they reach up to 41% in Calabria.

Le Donne Dell'Ortofrutta (*Women in fruit and vegetables, authors' English translation*) – The Italian fruit and vegetable sector has nearly 300,000 active farms and accounts for about a quarter of national agricultural production. Women hold very specific roles within companies; although they represent 69% of the workforce, they are still too often absent in management contexts. With a university degree (62%), women work on the family farm (46.8%) or in cooperative realities (17.7%) for more than 40 hours a week (67.1%); their typical day starts between 7:00 and 8:30 a.m. and ends between 6:00 and 7:00 p.m.; they also work on Saturdays ("always" 25.3%, "sometimes" 62%) and never stop because they train (87.3%) and take care of children and/or parents and/or other family members (73.4%).

Le Donne Del Vino (*The women of wine, authors' English translation*) – Family wineries have in many cases found different cues and curious derivations to build the image and products of their businesses in the new generation, including female descentents. The Women of Wine have set an example for women's representatives in other Italian production sectors by promoting equal opportunities in the world of work and business. The presence of women in wine businesses is concentrated in marketing and communication where they are 80% of employees, in wine tourism and other tourism activities, where they are 76–75% of employees, respectively. They also slightly prevail in sales (51%), while in the vineyard and winery their share plummets to 14%. Thus, we can say that women turn Italian wine into euros.

2.6 Positioning this research

One significant event for the country is the International Workshop on Water and Gender, organized by UNESCO World Water Assessment Programme (WWAP) in collaboration with the University of Pisa. Held on January 28–31, 2025, in Pisa, Italy, this workshop brought together water and gender scientists, governmental institutions, and practitioners to discuss topics such as women's leadership, participation, and decision-making in water management. The workshop underscored the importance of inclusive access and the development of policy instruments for equality in the water sector.

UNESCO in Italy: Additionally, the UNESCO WWAP office, located in Italy, has developed a toolkit titled *UNESCO WWAP Toolkit on Sex-Disaggregated Water Data*, which aims to address the information gap on water and gender. This toolkit provides methodologies and indicators that can be applied in various contexts, including Italy, to assess and promote gender equality in water resource management and the presence of this institution has reverberated into the actions of other Italian realities in developing more awareness on the theme of water and gender. The methodological approach of UNESCO WWAP and related indicators list pave the way to the methodological section of this research.

By applying the UNESCO WWAP framework to Italy, this study addresses critical gaps in both data and analysis. It adapts established international methodologies to a national context with distinct sociopolitical and cultural characteristics, contributing to both academic literature and policy development.

3. Methodology

The data analysis and findings will provide empirical evidence regarding water and gender in the water sector of Italy. Some of the findings from this study (literature review and success stories) have been presented here to assist Italy's water sector in initiating assessing progress towards the attainment of SDG 6 (water and sanitation) and SDG 5 (gender equality). The methodological framework established by UNESCO and already tested in an Argentinian study by UNESCO, will serve as a solid reference for this analogous research regarding Italy (Imburgia et al., 2020)

In this section the research design and methodology applied in developing the current study will be carefully described. This study adopts a mixed-methods approach (Creswell et al. 2017), combining qualitative and quantitative techniques to capture the complexity of gender participation in Italy's water sector. This methodology section expands on sampling strategies, data collection instruments, analytical techniques, and the operationalization of UNESCO WWAP indicators.

3.1 Research design

The paper begins by providing the context for this study. The context encompasses national, regional, and international policy frameworks for gender equality in the water sector, emphasising the significance of utilizing sex-disaggregated water data and gender indicators to guide water policies. A comprehensive description of the design and execution of the methodological approach is subsequently provided, encompassing the application of the *UNESCO WWAP Toolkit on Sex-Disaggregated Water Data* and the utilization of gender and water indicators for Italy, with some additional indicators compared to the Argentinian paper, regarding Italian women in the agricultural sector.

The research is structured in two phases: (1) scoping and preliminary analysis using secondary data, and (2) primary data collection through surveys, interviews, and focus groups. This design enables triangulation between statistical trends and lived experiences, ensuring both breadth and depth of analysis.

3.2 Sampling strategy

Primary data will be collected from approximately 30–50 key informants and 200–250 survey respondents. Participants will be drawn from four sectors: (i) academia and research; (ii) government and public utilities; (iii) agriculture and irrigation associations; and (iv) civil society, including NGOs and grassroots movements. Purposive sampling will ensure representation across gender, geography, and institutional roles.

The interviews with key informants, focus group discussion in the occasion of two different panel session in specific conferences, plus online and in-person surveys will constitute the basis of the primary data. Networking has been initiated during the First International Workshop on Gender and Water in Pisa (30-31 January 2025) , two major national events launching the questionnaire^[1] and the website “Women in Water Italy” in November 2025 and at the “International Workshop on Hydropolitics in Italy, Europe and the Mediterranean” in Bergamo (27-28 November 2025) will end up in the full outreach time of the questionnaire which will be open until December or until the full number of 250 respondents is achieved. All events will have occurred within the year 2025. Also, secondary data, including online sources will form the body of secondary literature. The research will also include using archival and/or photographic material.

This study employs the classical mixed-methods approach normally used in social research and human geography, combining qualitative and quantitative data collection techniques (Creswell and Plano, 2017; Hay 2016). Primary data will be collected through semi-structured interviews with key-informant women professionals in the water sector, policymakers, and representatives from NGOs. An online survey will be also distributed to gauge perceptions of gender inclusion within water management institutions, the third sector (NGOs, grassroots organizations), agriculture and irrigation bodies through the main website of the project “Women in Water”.

Secondary quantitative data sources will include academic literature, policy documents, and reports from organizations such as the European Environment Agency (EEA) and the Italian National Institute of Statistics (ISTAT).

Data analysis will involve thematic coding for qualitative responses and statistical analysis for survey data.

3.2 Coding of methodology

This study follows a similar enquiry produced for UNESCO for Argentina, using the UNESCO WWAP gender-responsive indicators (Miletto et al., 2019) that were already selected for the Argentinian study (Imburgia et al.2020) and listed in Figure 2 and Figure 3:

PRIORITY TOPIC 1 - GENDER-RESPONSIVE WATER GOVERNANCE	
1a) Gender-responsive water policy frameworks	1a.i. Number and percentage of regional, national, sub-national and sectoral water policy frameworks that are gender-sensitive/responsive/transformational ^a and status of implementation (such as planning phase, early implementation, and full implementation).
1b) Gender-responsive management in water governance institutions^b	1b.i. Number of Female/Male (F/M) staff in different job positions (levels), job field, and salaries (scales) in (a) national ministries that deal with water resources, ^c and (b) in public/private utilities and commissions for water-related services. ^d
	1b.iii. Participation by F/M staff (position)/board members/committee members in decision-making processes in (a) national ministries that deal with water resources, ^e and (b) public/private utilities and commissions for water-related services; ^f reasons for participation/non-participation; proportion of F/M participation; number of gender-specific ^g decisions adopted resulting from contributions made by F/M participants.
	1b.iv. Presence of F/M job positions (such as Gender Focal Point) responsible for gender policy and gender concerns in (a) national ministries that deal with water resources, ^h and (b) public/private utilities and commissions for water-related services; ⁱ contribution of these staff positions to gender-specific decisions/actions.

Figure 2: UNESCO WWAP Priority Topic 1 *Source: Miletto et al. (2019).*

PRIORITY TOPIC 10 - WATER EDUCATION AND TRAINING	
10b) Gender sensitization training	10b.i. Number of F/M staff/employees in different job positions participating in gender-sensitive/responsive training events in (a) national ministries that deal with water resources, ^j (b) in public/private utilities and commissions for water-related services, ^k (c) water-related industry and enterprise; feedback on the usefulness of the training from F/M staff/employees.
10c) F/M access to formal, informal and vocational water education, training and employment	10c.i. Number of F/M students enrolled (current or past) in water-related science and technical/vocational courses in formal and informal education/training institutions, such as universities, colleges, technical training institutes/technical and vocational education and training (TVET), specifying topic, level and duration.

Figure 3: UNESCO WWAP Priority Topic 10 *Source: Miletto et al. (2019).*

In addition to the indicators used for the Argentinian case, this research also covers the irrigation-related topics, embedded in the data regarding agriculture, and present in the recently released Italian Census on Agriculture (2024). These additional data will reflect the role of women in Italian agricultural sector, thus, enlarging the role of “water manager” not only to the water-related services but also to women who are water-users. In agriculture, therefore, the indicators are:

- Percentage of women farmers in total
- Percentage of women workforce in total
- Percentage of women landowners in total
- Percentage of women labour force in the agricultural sector as part of total labour force

In order to investigate power of women-farmers and women agricultural workers and related information on access to irrigation, irrigation extension services, ownership of land, rights and tenure, the following indicators will suit the research best, as illustrated by figure 4 and figure 5 :

5.a.i, regarding land ownership rights and tenure; 5.a.vi. F/M access to sources of formal and informal credit for improving irrigation

5a Access to irrigation

5a.i. Number of irrigated and non-irrigated farms, with size and type of F/M land ownership rights and tenure, in the survey area or region.

5a.ii. Number of F/M holders of irrigation water rights in (a) formal surface and groundwater irrigation schemes; (b) informal, community/group irrigation schemes; and/or (c) permits for private groundwater withdrawal for irrigation; F/M perception of the a) tariff structure, b) schedule and quantity of water supply, c) safety for women irrigators.⁵⁰

5a.iii. Number of F/M farmers engaged in urban/peri-urban agriculture⁵¹ with average size of plots and accessibility to paid and unpaid irrigation with source of water.

5a.iv. Number of households with sex and age of head of the household that access irrigation water free of charge from freshwater sources, such as rivers, lakes and aquifers; type of irrigation system.

5a.v. F/M perceived changes in irrigation water quantity and quality, if any, with causes, such as climate variability, climate change, increased withdrawal, pollution; effect on crop productivity; and type of adaptation strategies used, such as crop diversification, rainwater harvesting systems, and improving soil moisture conservation.

5a.vi. F/M access to sources of formal and informal credit (banks, cooperatives, self-help groups, social networks, moneylenders, etc.) for improving irrigation, including rainwater harvesting measures.

5a.vii. F/M access to extension⁵² support, including incentives, for adopting sustainable water and soil management practices,⁵³ and reducing the use of chemical fertilisers and pesticides.

Figure 4: Indicators 5a, which will be used in the Italian questionnaire *Source: Miletto et al. (2019).*

In particular, the section 5b and 5c has been accurately studied in order to explore the unaccounted for work, in terms of payment of salary and time spent in the farm, by Italian women farmers, as mentioned in the previous section by Confagricoltura Donne.

5b F/M paid and unpaid labour in agriculture and irrigation

5b.i. F/M paid/unpaid labour with wages and tasks in the construction and management of local/community level irrigation systems (traditional or recent).

5b.ii. Intra-household F/M division of unpaid labour by crop and season in irrigated and non-irrigated or rainfed agriculture⁵⁴ in the area of study.

5b.iii. F/M wage labour, by crop and season, in irrigated and non-irrigated or rainfed agriculture in the area of study (farm level or community level) with respective tasks and wages.

5c Intra-household decision-making

5c.i. Participation by F/M members in intra-household decision-making regarding allocation of financial resources for improving irrigation (with type of irrigation).

5c.ii. F/M participation in intra-household decision-making in the prioritization and use of water for different uses on the farm, such as for crops, livestock, aquaculture, and participation in the value chain (value addition to crops such as processing of produce⁵⁵).

Figure 5: UNESCO WAP Indicators 5b and 5c, which will be used in the Italian questionnaire

Source: Miletto et al. (2019).

Regarding the issue of the need to avoid tokenism and create real influence (Lima et al., 2025; Adams et al., 2018), derived by genuine women's participation, a specific list of indicators will be also tested in order to investigate whether tokenism or real influence prevails in a certain institution, or water-related sectors, be it an NGO or a Ministry. The table below presents the list of topic indicators for avoiding tokenism and that will be shaping the questionnaire or secondary data, according to their type and source of data (see Table 1).

Topic	Indicators of Influence (Meaningful Participation)	Indicators of Tokenism (Symbolic Participation)	Possible Data Sources	References
Decision-making authority	Women hold leadership positions (chair, vice-chair, minister, director) in water-related institutions; women have voted rights and their votes outcomes	Women occupy junior or advisory roles without decision-making power; decisions taken without women's input despite their presence	Institutional organograms, governance charters, meeting minutes	Singh (2008); Das (2014)
Agenda-setting power	Women propose agenda items and these are discussed or adopted in official meetings	Women attend meetings but never propose or influence the agenda	Meeting agendas, interviews with participants	Das (2014); Adams et al. (2018)
Policy influence	Policies or regulations reflect women's proposals or gender-responsive measures; evidence of changes attributed to women's advocacy toward water issues	Absence of observable policy changes linked to women's participation; women's contributions is ignored or removed from final policy drafts	Policy documents, interviews, legislative archives	Singh (2008); Lima et al. (2025)
Resource allocation	Budget allocations or project funding reflect women's identified priorities (like agricultural irrigation extension services for women farmers)	Women present but no shift in resource allocation priorities	Budget reports, project funding data	Lima et al. (2025); Adams et al. (2018)
Representation diversity	Representation of women from varied regions, socio-economic groups, and sectors (agriculture, science, policy)	Women from a narrow elite group with no representation of broader demographic diversity	Membership lists, socio-demographic data	Adams et al. (2018); Singh (2008)
Capacity to speak and be heard	Women regularly contribute to water-related discussions, and their input is actively engaged with by others	Women are silent, interrupted, or contributions are not acknowledged	Meeting transcripts, observation notes, interviews	Das (2014); Adams et al. (2018)
Continuity of engagement	Women remain in positions across multiple cycles, suggesting institutional trust and stability	Women rotate quickly, with high turnover suggesting symbolic appointments	Appointment records, tenure data	Singh (2008); Lima et al. (2025)
Institutional support	Presence of mentorship programs, gender mainstreaming and transformative policies, and formal commitments to support women's roles	No institutional mechanisms to strengthen women's participation beyond formal membership	Policy statements, HR guidelines	Lima et al. (2025); Adams et al. (2018)

Source: Francesca Greco

The table has been converted to a scoring index in the questionnaire, according to a matrix (see Annex, point 2).

Online questionnaire

The online questionnaire investigates the following items:

- Perception about women in the water sector and their career pattern compared to male colleagues
- Perception about women in the water sector and their political power compared to their male colleagues
- Perception regarding women in the water sector and their decision-making power compared to their male colleagues

Direct interviews with key informants

This research employs a methodology that integrates qualitative and secondary data analysis to examine gender participation in water resource management in Italy. Primary data collection entails semi-structured interviews with key informants, such as policymakers, academics, and professionals in the water sector, in addition to focus group discussions with women engaged in science and technology-related water fields.

The semi-structured interview with key informants will revolve around the same questions as the online questionnaire, plus a series of personal questions regarding narratives and personal history of gender equality/inequality, discrimination/equal treatment in their professions. The aim here is interviewing 30 to 50 key informants. These methods seek to document individual experiences, obstacles, and prospects. Secondary data sources, including policy documents, scholarly literature, and statistical reports, offer contextual and comparative insights. Data sorting entails thematic categorisation according to recurring themes and patterns, whereas analysis employs a qualitative content analysis method to discern trends, gaps, and policy implications. The triangulation of data from various sources guarantees reliability and validity.

3.3 Data collection instruments

The online questionnaire covers:

- Perceptions of women's career trajectories in the water sector
- Political influence and decision-making power relative to male colleagues
- Access to resources, training, and leadership opportunities in the sectors of education, academia, government and agriculture

Questions are designed so to use a mix of Likert scales (to indicate their level of agreement or disagreement), multiple-choice items, and open-ended questions. Semi-structured interviews will expand on these themes, allowing for narrative accounts of barriers, opportunities, and personal experiences.

3.4 Operationalization of UNESCO WWAP indicators

The study will apply the UNESCO WWAP gender-responsive sex disaggregated indicators (Miletto et al., 2019) adapted from the Argentinian case (Imburgia et al., 2020). Priority indicators include:

- 5.a.i: Land ownership rights and tenure
- 5.a.vi: Access to formal/informal credit for irrigation improvement

Additional agriculture-related indicators will be integrated from the 2024 Italian Census of Agriculture, including:

- Percentage of women farmers and landowners
- Percentage of women in agricultural labour force
- Percentage of women accessing irrigation extension services

All indicators are compared and, if needed, complemented with the list of topic-indicators to avoid tokenism (table1) according to each topic.

3.5 Data analysis

Qualitative data will be coded thematically using NVivo, following a coding framework informed by Feminist Political Ecology on water resources, water extractivism and gender-roles in the water sector, but also using intersectionality literature, which, in Italy, will particularly refer to income-class and immigrant/non-immigrant women in agriculture. Quantitative survey data will be analyzed in Statistical Package for the Social Sciences (SPSS) using descriptive statistics, cross-tabulations, and, where sample sizes allow, chi-square tests for association in order to measure if two categorical variables are related or independent. Comparative analysis will examine differences by sector, region, and institutional type. SPSS will allow for the creation of various charts and graphs (histograms, scatterplots, etc.) to visualize data and identify patterns and trends.

3.6 Ethical considerations, limitations of the study and risk assessment

Participation will be voluntary, with informed consent obtained from all respondents. Data will be anonymized and stored securely, following the EU law on General Data Protection Regulation (GDPR) and ensuring its compliance throughout the process.

While the methodology aims for breadth and depth, limitations include potential self-selection bias in survey participation and the current risk of lack of comprehensive baseline data. These limitations and risks will be addressed through triangulation with multiple data sources.

4. Discussion

This preliminary paper on literature review, research gap and methodology has the aim to mark a first step in the opening of a necessary and urgent enquiry in the field of water and gender. A second paper, after the first analysis of data, will subsequently examine the empirical findings derived from the implementation of this approach, seeking to utilize WWAP gender-responsive indicators in the water sector through interviews and online questionnaires, online event for networking and aggregation of interested key-informants.

This section will be limited to the interpretation of preliminary insights derived from the literature review, scoping study, and early stakeholder engagements, integrating the theoretical perspectives outlined in Section 2. While full empirical results will be available following the completion of fieldwork in November-December 2025, these preliminary findings reveal structural and cultural dynamics that shape women's participation in Italy's water sector.

Regarding structural barriers and gendered institutions, the evidence reviewed suggests that Italy's water governance system is embedded in institutional norms that perpetuate gender inequality. Theories of gendered institutions explain how these patterns persist through recruitment practices, decision-making processes, and professional hierarchies. For example, agricultural cooperatives and irrigation consortia often allocate leadership roles based on seniority or lineage, privileging male succession. The age of farmers is beyond 65 years and the prevalence is a male-dominated environment.

If we consider the sociocultural context and intersectionality, under this lens, gender stereotypes continue to influence perceptions of women's technical competence, particularly in engineering and hydrology. These stereotypes intersect with other forms of marginalization – such as regional economic disparities – producing compounded disadvantages for women from southern Italy or rural areas. Intersectional analysis underscores that gender cannot be understood in isolation from class, ethnicity, and geography, as the literature on feminist, post-colonial, development and gender studies confirms.

Under the point of view of women in agriculture and water management, in this case the role of women in agriculture-related water use is significant but yet undervalued. Initiatives such as “Confagricoltura Donna” and the “Women of the Water” network demonstrate women's capacity for leadership in irrigation management, climate adaptation, and sustainable farming. However, the lack of integration of these initiatives into mainstream water governance limits their systemic impact.

There are, thus, significant policy gaps and opportunities to improve the Italian compliance and adherence to EU gender norms. In particular, Italy's adherence to EU gender and water directives has not translated into gender-transformative policy at the national or regional level. Opportunities exist to embed gender-responsive and WWAP sex-disaggregated indicators into national water strategies, particularly through collaboration between the Ministry for the Environment, ISTAT, and the next Agricultural Census of the Ministry of Agriculture.

This scoping paper and the presented methodological approach aim at demonstrating the hypothesis of the full applicability of the UNESCO WWAP Framework and sex-disaggregated indicators for Italy.

A preliminary application of the WWAP indicators suggests their suitability for capturing structural disparities in participation, access, and decision-making over water. However, adaptations are needed to address Italy's fragmented water governance system, where competencies are split between national ministries, regional authorities, and local utilities, in a myriad of local institutions such as Water Consortia, River Basin Organizations (as per EU Water Framework Directive), Regional Government, but also bottom-up informal voluntary institutions such as "Contratti di Fiume" (DCF) that have no budgeting power, but can handle more participation and inclusive administration of water governance in the country.

This paper, furthermore, in the view of a future research agenda, also attempts to acquire a comparative and longitudinal potential thanks to the inclusion of comparative dimensions – both with Argentina's case study and across Italian regions – that can illuminate how institutional reforms, EU policy shifts, and broader economic changes influence women's roles over time. Another possible comparison will be with France, whose sex-disaggregated indicators for water are being explored and tested in contemporaneity with this study. Longitudinal tracking could also assess the impact of specific interventions, such as training programs or gender quotas in water boards of different countries.

Finally, an important "lessons learned" from this preliminary study is that early engagement with stakeholders confirms that raising awareness about gender and water is itself a catalyst for change. The planned dissemination of the questionnaire in two major national events are already creating interest from the media, and do attract spaces for dialogue, adding further dissemination to the research initiative.

The discussion of the ongoing results from the questionnaire and a first data analysis will be exposed at the International Workshop "Hydropolitics in Italy, Europe and the Mediterranean" in November 2025. This occasion will be also the location of the first focus group with 42 representative from the water sector, plus an open public audience who will be able to participate. The question will be raised whether gender stereotypes and the socio-cultural context of Italy, Europe and the Mediterranean is also reflecting in how gender roles and women's role are reflected in the water sector of these countries, according to the participants. The focus group discussion will be guided by interpretations of the data when available. The discussion will also relate back to key agendas, policy and/or legislative concerns from EU legislation, South Mediterranean legislation and Italian legislation, including issues to do with achieving relevant SDGs (e.g. SDG 6 and SDG 5) in view of a larger research agenda.

5. Conclusions and recommendations

This study represents the first presentation of a structured proposal to apply the UNESCO WWAP gender-responsive indicators on water to the Italian context, with the intent of filling a critical gap in both academic literature and policy discourse. The preliminary analysis of secondary data confirms the absence of comprehensive sex-disaggregated data in Italy's water sector; this, in turn, highlights the need for a specific research to enquire whether there is or not a persistence of institutional and cultural barriers limiting women's participation in decision-making and technical roles.

5.1 Key conclusions

The main conclusion confirms the existence of an evidence gap in Italy: currently, no national dataset comprehensively measures women's roles in water governance, policy, and technical domains. There is a lack of a national dataset that assesses women's participation in water governance, policy, and technical areas in a comprehensive manner. This enquiry will be the first of its kind in the country, therefore denoting its innovative features and the urgent need of deployment.

In Italy, institutional barriers in recruitment and leadership structures in water-related institutions tend to reproduce gender imbalances. Examining the impediments posed by institutions, a concluding remark is that it will be very likely, at the end of the questionnaire survey, to find a tendency for individuals in water-related organizations to replicate gender disparities in their recruitment and leadership structures, as it is currently happening in other organizational structures. This will be assessed after the discussion of the survey's data in 2026, in the occasion of World Water Day 2026, 22nd of March, seeking attention from media and national press.

Furthermore, in Italy, cultural factors, in particular gender stereotypes, intersect with regional and socio-economic disparities to exacerbate exclusion. Despite being an OECD and EU country, the intersection of gender stereotypes, socio-economic inequality, and geographical differences is still a cultural factor that contributes to the exclusion of vulnerable groups in Italy. As stated in the background paragraphs, the gender and water directives of the European Union are not adequately operationalised in national policies, which results in a policy disconnect. This disconnect is produced by the fact that EU gender and water directives are insufficiently operationalized in the Italian national strategies, despite gender equality was comprised as one of the 3 crosscutting missions of the Italian National Plan under the post-pandemic strategy, called Italy's Recovery and Resilience Facility Plan (RRF Plan) (Badalassi 2022).

Initiatives such as “Confagricoltura Donna” and the “Women of the Water” network provide significant examples for gender-responsive water management. These practices are considered to be promising not only because they are spontaneously generated by women in the agricultural sector, but because they also shed light on the fact that women experience some of the most recognized inequalities in the agricultural sector, in Italy, as compared to men. For example, women experience “unaccounted for working hours”, especially in the traditional “family-run” Italian farms, and difficulties in accessing extension services for irrigation. These findings will be possibly explored more and expanded upon with the project survey.

5.2 Recommendations

As a first recommendation, regarding capacity building, there is a need to create specialised training for women who are not only in leadership jobs, but also in technical and unskilled agricultural jobs connected to water, including fisheries, with a particular emphasis on areas that are considered to be under-represented. While we do have business-women associations in Italy, we still do not have women in irrigation or women workers in agriculture associations in Italy. Class is still a barrier to women’s capacity to organize and ask for better gender policies. These usually coincide with sans-papier immigrant women workers.

Secondly, it would be a good experiment establishing gender quotas in water boards, irrigation consortia, and other related decision-making organizations as a step in the institutional reform approach.

Finally, it would be extremely useful to incorporate UNESCO WWAP gender-responsive indicators on water into the national water policy by including them into the statistical reporting of ISTAT, the National Statistical Bureau of Italy for the purpose of supporting longitudinal research and policy assessment, establishing a common repository for sex-disaggregated water data in Italy for self-assessment and constant comparison with other European and non-European countries. The presence of a central repository for sex-disaggregated water data in the RRF monitoring plan or in the Ministry of Agriculture or directly in the “Dipartimento per le Pari Opportunità” [Department for Equal Opportunities] within the cabinet of the President of the Council of Ministers who is, for the first time in Italian history, a woman. In particular, the Presidency of the Council of Ministers, embeds the office of the Ministry for the Family, Natality and Equal Opportunities. Involvement of such prominent institutional stakeholders is fundamental, if Italy wants to encourage and reach a real collaboration among government, civil society, and academic institutions to develop water policies that effectively shift gender roles.

6. The way forward

The research gap in the field of gender and water in Italy is relevant, and the way forward points at the need for more academic research on the topic. The limitations of the study will be addressed in the course of 2025, with the investigation and the publication of results in 2026. As mentioned in the recommendations, it is clear that in Italy in order to co-create gender-transformative policies, it is important to foster collaborations between the government, civic society, and academic institutions that will want to take part in making change.

In line with this principle, the next phase of this research will involve full-scale implementation of the methodology, survey administration and results' analysis, culminating in a comprehensive investigation and dataset building, while ensuring stakeholder inputs and strengthening the methodological rigor. Dissemination of findings on World Water Day 2026 will support the uptake of recommendations. The ultimate goal is to move beyond descriptive assessments toward actionable strategies that advance SDG 5 and SDG 6 in Italy.

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Annex 1

NOTES TO THE UNESCO WWAP INDICATORS

Notes:

a. "Gender-sensitive water policy: the water policy framework identifies and acknowledges the existing differences and inequalities between women and men; Gender-responsive water policy: the water policy framework identifies and acknowledges the existing differences and inequalities between women and men and articulates policies and initiatives which address the different needs, aspirations, capacities and contributions of women and men; Gender-transformative water policy: the water policy framework implements actions and initiatives that challenge existing discriminatory policies and/or practices and carries out changes for the betterment of quality of life for all (UNESCO, 2014)." (Miletto et al., 2019, Tool 1).

b. Water ministries and public/private utilities and commissions contracted/mandated to manage and supply drinking water, sanitation and hygiene services, irrigation water, wastewater treatment and management, renewable energy production services (such as hydropower, management of reservoirs, etc.) such as drinking water, sanitation, wastewater, watershed management, irrigation, environment.

d. Public/private utilities contracted/mandated to manage and supply drinking water, sanitation and hygiene services, irrigation water, wastewater treatment and management, renewable energy production services (such as hydropower, management of reservoirs, etc.).

Annex 2

SCORING METHOD FOR DETECTION OF TOKENISM OR REAL INFLUENCE AND PARTICIPATION

INDICATOR TOPIC	Indicators of Influence (Meaningful Participation)	Indicators of Tokenism (Symbolic Participation)	Possible Data Sources	Score (0–2)	Evidence Notes
Decision-making authority	Women hold leadership positions (chair, vice-chair, minister, director) in water-related institutions; women have <u>voting</u> rights and their votes shape outcomes	Women occupy junior or advisory roles without decision-making power; decisions taken without women's input despite their presence	Institutional organograms, governance charters, meeting minutes		
Agenda-setting power	Women propose agenda <u>items</u> and these are discussed/adopted in official meetings	Women attend meetings but never propose or influence the agenda	Meeting agendas, interviews with participants		
Policy influence	Policies or regulations reflect women's proposals or gender-responsive measures; evidence of changes attributed to women's advocacy	No observable policy changes linked to women's participation; women's contributions ignored or removed from final policy drafts	Policy documents, interviews, legislative archives		
Resource allocation	Budget allocations or project funding reflect women's identified priorities (e.g., equitable water access, agricultural irrigation for women farmers)	Women present but no shift in resource allocation priorities	Budget reports, project funding data		
Representation diversity	Representation of women from varied regions, socio-economic groups, and sectors (agriculture, science, policy)	Women from a narrow elite group with no representation of broader demographic diversity	Membership lists, socio-demographic data		
Capacity to speak and be heard	Women regularly contribute to discussions, and their input is actively engaged with by others	Women are silent, interrupted, or contributions are not acknowledged	Meeting transcripts, observation notes, interviews		
Continuity of engagement	Women remain in positions across multiple cycles, suggesting institutional trust and stability	Women rotate quickly, with high turnover suggesting symbolic appointments	Appointment records, tenure data		
Institutional support	Presence of mentorship programs, gender mainstreaming policies, and formal commitments to support women's roles	No institutional mechanisms to strengthen women's participation beyond formal membership	Policy statements, HR guidelines		

1. NOTE 1: Two national events : “L’eredità delle Donne” , online and “ELLE MasterClass” in presence in Milan, in collaboration with the magazine ELLE ITALIA. Will launch the website and related questionnaire at the national level. ↑



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