Methodology for the collection of sex-disaggregated water data
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L. Thuy, M. Miletto and V. Pangare

UNESCO WWAP Toolkit on Sex-disaggregated Water Data
## CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acknowledgements</td>
<td>6</td>
</tr>
<tr>
<td>Foreword</td>
<td>7</td>
</tr>
<tr>
<td>Preface</td>
<td>8</td>
</tr>
<tr>
<td>1  Introduction</td>
<td>10</td>
</tr>
<tr>
<td>2  Conceptual and methodological foundations</td>
<td>14</td>
</tr>
<tr>
<td>2.1 Valuing social knowledge and physical system-based information</td>
<td>15</td>
</tr>
<tr>
<td>2.2 Combining quantitative and qualitative information</td>
<td>17</td>
</tr>
<tr>
<td>2.3 Combining macro and micro data</td>
<td>20</td>
</tr>
<tr>
<td>2.4 The incomparability of inequality</td>
<td>21</td>
</tr>
<tr>
<td>2.5 Lifting the roof off the household</td>
<td>23</td>
</tr>
<tr>
<td>3  Methods of data collection</td>
<td>24</td>
</tr>
<tr>
<td>3.1 Qualitative and quantitative data</td>
<td>25</td>
</tr>
<tr>
<td>3.2 Fact-finding</td>
<td>26</td>
</tr>
<tr>
<td>3.3 Participant observation of group/public activities</td>
<td>30</td>
</tr>
<tr>
<td>3.4 Household and intra-household surveys</td>
<td>32</td>
</tr>
<tr>
<td>4  Conclusions</td>
<td>34</td>
</tr>
<tr>
<td>References</td>
<td>36</td>
</tr>
<tr>
<td>List of acronyms</td>
<td>42</td>
</tr>
</tbody>
</table>
UNESCO WWAP wishes to acknowledge the work of Joni Seager, author of the Technical Paper, *Methodology for sex-disaggregated water assessment, monitoring and reporting*, which was published as part of the Gender Toolkit in 2015. The methodology described in this 2019 edition is largely inspired by this original edition.

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Women and men have an equal stake in water management, yet inequalities persist with regards to who participates in, contributes to and benefits from water resources management.

This matters because women make up nearly half of the global population involved in agriculture and food production. They have different household responsibilities, which have an impact on hygiene, sanitation, and even public health. Moreover, the lack of water and sanitation diminishes in different ways women's opportunities for health, education and employment.

Designing any effective action to achieve equality between men and women begins with ensuring the availability of sharp and reliable data. Such sex-disaggregated data is important to inform programmes and policies that mainstream gender as an overarching development issue. Yet only around a third of countries in the world currently collect sex-disaggregated data for water management.

This toolkit, prepared by UNESCO’s World Water Assessment Programme, aims to tackle the information gap on water and gender, as the scarcity of data is a major obstacle to the production of scientific evidence of gender inequality. Following field testing, this second edition contains improved indicators and a refined methodology to better meet the needs of all countries and reflect the realities on the ground.

The overall goal of this publication is to provide the indicators and methodology to build an information stock of internationally comparable data on sex-disaggregated water data. It is only through this data that we can inform policy-oriented action, compare experiences between countries and regions and, crucially, apply concrete solutions in the field.

Gender equality is a human right and one of UNESCO’s two global priorities. It is essential to meet the commitments of the United Nations 2030 Agenda for Sustainable Development. Strengthening gender equality in water management can also strengthen social inclusion, improve environmental sustainability and ensure food security.

This updated toolkit embodies UNESCO’s commitment to human rights and international cooperation in science, by ensuring gender equality in the field of water for a more sustainable, inclusive and peaceful future.
When the United Nations 2030 Agenda for Sustainable Development and its Sustainable Development Goals (SDGs) were adopted in 2015, it marked a new era in the efforts to shift the world towards a sustainable and resilient path. Today, access to water and sanitation for all (SDG 6) and achieving gender equality and empowering all women and girls (SDG 5), are considered major drivers of sustainable development.

Water assessment can only be meaningful with a gender perspective. It is therefore indispensable to identify women’s and men’s different roles and needs in their interaction with water resources, as well as the social and cultural constructions they are based upon. Taking these factors into consideration will improve the management and governance of the world’s water resources for the benefit of all.

The role of women in water management was first recognized at an international gathering of water experts in Dublin, Ireland in January 1992, where the participants declared the following:

“Women play a central part in the provision, management and safeguarding of water ... [and that] acceptance and implementation of this principle requires policies to address women’s specific needs and to equip and empower women to participate at all levels in water resources programmes, including decision-making and implementation, in ways defined by them” (Dublin Statement on Water and Sustainable Development, Principle 3)

Yet, after more than a quarter of a century, and in spite of their acknowledged and documented critical role in water management for livelihoods, women still remain marginalized from decision-making, have slim control over the use and allocation of water resources, and have marginal access to assets, such as technologies and relevant vocational training.

As a means to address the imbalance between responsibilities and power, and/or rights between men and women, it is paramount to first understand the underlying drivers and the root causes for these discrepancies, and to quantify them so that appropriate changes can be made in the design, planning, monitoring and evaluation of water projects or programmes, as well as in water policies and strategies.

In recognition of these gaps, the 2030 Agenda pledges the need for high-quality, timely and reliable disaggregated data, including by sex, as they are key to ensuring that no one is left behind, and are essential to the measurement of progress in achieving the SDGs.

Considering that data are the lifeblood of decision-making, there is evidence that sex-disaggregated water data are among the least available across the national-level indicators. The lack of sex-disaggregated water data is a major obstacle to the production of scientific evidence on gender inequalities related to water and to the formulation of gender-transformative policies. Investing in ‘engendering’ water contributes to the strengthening of social inclusion, eradicating poverty and advancing environmental sustainability.
In this respect and following UNESCO’s global priority on gender equality, WWAP is committed to advancing women’s empowerment and gender equality in the water realm. Its work produces meaningful and significant insights and understanding of the role of women and men in the management of water resources as well as in income-generating opportunities. The creation of clear-cut benchmarks of sex-disaggregated water data is therefore crucial to inform regional, national and transboundary water policies, and to set up gender-transformative strategies in water governance. The accuracy of evidence strengthens women’s claim for a meaningful participation in decision-making mechanisms, access to job opportunities and capacity development.

The key message is vibrant — we urgently need to achieve human rights for all, including gender equality and the empowerment of all women and girls in water resources management and governance. In this process, we need to recognize women and girls as agents of change within their communities, and value their knowledge and achievements. This must include decision-making in water-related issues, where we can draw on the leadership of women in formulating equitable water policies also transcending national borders, thus contributing to peace building. Building a better future for all requires the full and equal participation of both women and men in the water realm and the empowerment of all members of society (stakeholders), creating a wellspring for innovation and dynamism.

For all these reasons, in 2014, UNESCO WWAP started a ground-breaking initiative on gender-responsive water assessment, monitoring and reporting, which included the identification of key indicators, the creation of a methodology, as well as guidelines and questionnaires to collect sex-disaggregated water data. Bolstered by the contributions of 35 international experts who were part of the WWAP Working Group on Sex-disaggregated Water Indicators, these elements constituted the first edition of the WWAP Toolkit on Sex-Disaggregated Water Data published in 2015.

From this date onwards, the WWAP Toolkit has gained official recognition in the international water arena. Funded by the Italian Government since the beginning, it was the first global effort to promote the collection of sex-disaggregated water data, and positioned the first overview of the status of gender equality with regard to access, participation in and contribution to water resources management around the world.

In 2016, the WWAP Toolkit was included as a resource in the technical paper prepared for Parties to the United Nations Framework for Climate Change Convention (UNFCCC). At its 23rd meeting in June 2018, the Inter-Governmental Council of the UNESCO International Hydrological Programme (IHP) endorsed the Toolkit, through Resolution XXIII-2, to be adopted by and disseminated among Member States. These recognitions provided the impetus and motivation to improve the document and produce a new edition.

I am pleased to introduce the 2019 version of the Toolkit: in this edition, we have updated the original key indicators and included new ones consistent with the 2030 Agenda. WWAP was supported by a group of specialists in the fields of gender equality, water resources, agriculture, sanitation, social science, anthropology and transboundary waters, who all provided valuable inputs in the discussion of new priority topics for indicators and the design of the questionnaire. Relevant changes in the indicators (Tool 1) and in the Questionnaire (Tool 4) are in line with the SDGs, and the results of the intra-household surveys undertaken within the Groundwater Governance in Transboundary Aquifers (GGRETA) project, funded by the Swiss Agency for Development and Cooperation (SDC) and led by UNESCO-IHP. The gender component of the project is developed by UNESCO WWAP.

I urge you to read this new edition, and fully use the knowledge gained in future water assessment programmes and projects, with the hope that it would help to bridge the gap of sex-disaggregated water data in national water statistics and inform evidence-based, gender-transformative actions and policies at regional, national and transboundary levels.
1 INTRODUCTION
“Evidence shows that investing in the nexus between water and gender is crucial to achieving the 2030 Sustainable Development Agenda. In fact, enabling fair access and control of water resources is necessary to achieve women’s empowerment and gender equality worldwide. These innovative tools and indicators are designed to help decision makers adopt data-driven, gender-transformative water policies and reach those left behind.”

Corat Saniye Gülser, Director, UNESCO Division for Gender Equality

Water assessment can only be meaningful with a gender perspective. Identifying the factors that contribute to the inclusion or exclusion of women and men belonging to different social and cultural groups, and the ways in which they interact with water resources for different uses, could improve the provision, management and conservation of the world’s water resources for the benefit of all. The collection of sex-disaggregated water data is the first step towards a transformative process in achieving the goals of improving gender equality in the management of water resources and water governance.

UNESCO WWAP has created an innovative toolkit for the collection and analysis of sex-disaggregated water data to address the data gap on gender and water issues at the global level. The UNESCO WWAP Toolkit on Sex-disaggregated Water Data (WWAP Water and Gender Toolkit) is designed to assist the UN Member States in:

- Filling the gap of sex-disaggregated water data of national/regional water statistics;
- Creating a gender baseline knowledge related to water at the regional and national level and a global standard for gender-responsive/transformational water assessments;
- Strengthening capacity for the collection and analysis of sex-disaggregated water data, and providing tools to users in different regions and climates;
- Empowering women for their role and contribution in the field of water, which connects all SDGs, with particular focus on the SDGs 6 and 5; and
- Informing national and regional water policy frameworks, plans and strategies to enable gender-transformational actions to achieve the 2030 Agenda.

The work on the first edition (2015) of the WWAP Water and Gender Toolkit started in 2014 with the creation of the WWAP Working Group on Sex-disaggregated Water Indicators, a team of 35 international gender experts (see Annex), who identified 40 gender-sensitive priority indicators.

WWAP’s Water and Gender Indicators were first recognized during the Gender, Development and Water Conference in South Africa in 2014, and since then, the Toolkit has gained official recognition in the international water arena (Box 1).

The 2015 Toolkit has been tested in different regions in cooperation with national authorities, research institutes and international organizations. The intra-household surveys were carried out in Namibia and Botswana in the context of the GGRETA project1 funded by the Swiss Agency for Development and Cooperation (SDC) and led by UNESCO-IHP.

The Toolkit constitutes the core of the WWAP capacity development programme on gender analysis for water resources assessments and projects. As part of WWAP’s capacity development efforts, several trainings on the collection and analysis of sex-disaggregated water data took place in several countries in Europe, Latin America and Southern Africa. The Toolkit has also been used by practitioners in Asia.

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1 The Toolkit was tested by WWAP for the first time in the area of the Stampriet Transboundary Aquifer System as part of the Groundwater Governance in Transboundary Aquifers (GGRETA), an SDC-UNESCO-IHP project.
The positive response of the Member States with regard to the usefulness of the 2015 Water and Gender Toolkit inspired the development of a second edition. Along with lessons learnt in the field during the testing of the WWAP methodology, the international acknowledgement of the interlinkage between the Goals and Targets of the 2030 Agenda served as an important driver for the new 2019 edition of the 2015 WWAP Toolkit.

In this edition, a set of new conceptual indicators aligned with the 2030 Agenda were introduced, notably in the categories of human rights-based water resources management, water and education, indigenous knowledge and community water rights, migration, displacement, and climate change. Significant revisions were made in the other Tools, particularly in the Guidelines (Tool 3) and Questionnaire (Tool 4), where new and current questions have been simplified and made more specific, to further increase its applicability in the field. As such, it is worthwhile to follow the common thread that runs through the indicators covered in this Tool and the questionnaire in Tool 4, and through the methodology and guidelines described in Tools 2 and 3, respectively.

The 2019 edition of the WWAP Water and Gender Toolkit consists of four tools:

**Tool 1 – Gender-responsive indicators for water assessment, monitoring and reporting** provides a list of conceptual gender-responsive indicators covering the following priority topics:

1. Gender-responsive water governance;
2. Safe drinking water, sanitation and hygiene;
3. Gender-specific knowledge resources;
4. Transboundary water management;
5. Water for agricultural uses;
6. Water for industry and enterprise;
7. Human rights-based water resources management;
8. Water, migration, displacement and climate change;
9. Indigenous and traditional knowledge, and community water rights; and
10. Water education and training.

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**Box 1  Official recognition of the WWAP Toolkit on Sex-disaggregated Water Data**

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<tr>
<th>YEAR</th>
<th>OFFICIAL RECOGNITION/ENDORSEMENT</th>
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<tbody>
<tr>
<td>2014</td>
<td>WWAP indicators recognized by the African Ministers’ Council on Water (AMCOW) to be used in water assessments and monitoring</td>
</tr>
<tr>
<td>2015</td>
<td>WWAP Toolkit adopted in the Global Environment Facility’s (GEF) International Water Learning, Exchange and Resources Network (IW:LEARN) to support international water projects</td>
</tr>
<tr>
<td>2016</td>
<td>WWAP Toolkit included in the Guidelines for Gender and Climate Change of the United Nations Framework Convention on Climate Change (UNFCCC)</td>
</tr>
<tr>
<td>2016</td>
<td>WWAP Toolkit is officially recognized by the 60th Commission on the Status of Women (CSW60)</td>
</tr>
<tr>
<td>2018</td>
<td>WWAP Toolkit is endorsed by the 23rd Inter-Governmental Council of the UNESCO International Hydrological Programme (IHP) (Resolution XXIII-2)</td>
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The WWAP Water and Gender Toolkit has been tested in different regions . . . and constitutes the core of the WWAP capacity development programme
Tool 2 – *Methodology for the collection of sex-disaggregated water data* describes the methodology and its conceptual pillars for the collection of sex-disaggregated water data.

Tool 3 – *Guidelines on the collection of sex-disaggregated water data* considers the data collection methods covering the needs and focus areas of a broad range of users, making it applicable in different regions of the world.

Tool 4 – *Questionnaire for the collection of sex-disaggregated water data* lists over 400 questions, and suggests a methodology for the collection of data on the ten priority categories, which can be tailored according to the scope of interest.
2 CONCEPTUAL AND METHODOLOGICAL FOUNDATIONS
As physical access to — and control over — water is closely related to social norms and cultural values, a satisfactory evaluation of the gendered differences between men and women in relation to water must include assessment methods that reflect existing gender-based biases in social norms, attitudes, and ownership and/or control of productive resources. Such social variables are taken into account in the following methodological approach, which provides a conceptual framework for the collection and analysis of sex-disaggregated water data.

2.1 VALUING SOCIAL KNOWLEDGE AND PHYSICAL SYSTEM-BASED INFORMATION

Conventionally, technical and technological (e.g. infrastructure/engineering and biophysical) perspectives dominate the water and sanitation sector, and policy-makers are accustomed to looking first to the physical sciences for advice and information. Often, the ‘people aspect’ is less tangible in such sectors with a strong engineering tradition, where social and gender issues are frequently overlooked. Although the importance of gender equality has gained acceptance by the majority of the stakeholders in the water and sanitation sectors, interventions in the engineer-oriented sectors still tend to suffer a poor understanding of the interlinkages between gender equality and science. Moreover, there exists a general lack of high-level support (partly due to male-dominated organizations), and poor resources and accountability mechanisms for gender considerations, especially in comparison to interventions in the social sectors (WGF, 2014).

In the last decade or so, the limitations of discipline-based perspectives have become clear, and the need for an integrated approach to water management taking into account the social aspect has become apparent (National Research Council of the National Academies, 2004). The reason to advocate for more attention to the social aspect is straightforward: water management serves social objectives, such as the improvement of public health and safety, support of economic and recreational activities, and the sustenance of a socially-desired environment through the provision or availability of water-related services. The most effective solutions to these problems throughout history have drawn on ideas, insights and methods from physical, biological, and social thought and understanding (Lund, 2015).

For further reading, please see Bhattacherjee (2012).
One of the major barriers to the effective implementation of the gender equality principles and the achievement of sustainable results in water and sanitation is the low awareness of the motives and difficulties in transforming knowledge into practice (WWF, 2014). This is in turn caused by prioritising technical and technological perspectives in this sector, which may isolate water experts in particular colleagues undertaking social analyses. As social experts, gender experts are often excluded from policy-level discussions on water because their contribution to a ‘biophysical’ field such as water is perceived as minor or negligible. Although dialogue between gender specialists and water and sanitation experts has improved, the gap between them remains considerable.

Thus, the first conceptual ‘flip’ that is required for this new perspective to take place is to take a more cross-disciplinary approach between the different disciplines involved. Rather than attempting to define water resources as belonging under exact sciences and considering it in the context of physics or engineering, it must be recognized that the field belongs just as well under social sciences. This is made evident when the management of water resources is also perceived in the context of social relationships and human activities. The insights and expertise of social scientists and gender experts must be given equal prominence, as the insights and information from experts representing the physical sciences in any water sector processes, including, importantly, decision-making and policy-making.

Within a wide spectrum of practitioner and academic activity, this shift has largely been made: water is no longer considered to be the primary intellectual or policy domain belonging to physical scientists or hydrological engineers. Interest in the gendered dynamics of water, particularly its use, management and access, is conceptually rooted in two interrelated sub-fields: gender and development, and gender and environment.

From the 1970s into the 1980s, the ‘women in development’ (WID) approach was mostly pursued. This approach viewed women as productive members of society contributing to economic development, rather than passive recipients of welfare programmes (Boserup, 1970). In the late 1980s, focus shifted more towards “removing disparities in social, economic, and political balances between women and men as a pre-condition for achieving people-centred development.” (GWA/UNDP, 2006, p. 11). Simultaneously, emerging interests in women, nature and ecology sparked what is now a robust subfield of inquiry into the gendered dimensions of resources and environment (Ortner, 1974; Shiva, 1989; Leach, 1992; Mies and Shiva, 1993; Carney, 2004; Elmhirst and Resurreccion, 2008). From the late 1980s onwards, a shift in policy discourse took place with the ‘gender and development’ (GAD) approach arguing for a gender-planning perspective in all development work focusing on the power relations between women and men and addressing inequalities (Razavi and Miller, 1995).

Contemporary practitioner and academic interest in gender and water draw on all of these intellectual origins. A political economy approach to resources has helped to focus attention on water as a strategic, increasingly scarce and deeply socially-embedded resource around which class, gender and globalization struggles pivot (Shiva, 2002; Barlow and Clarke, 2003; Sultana, 2007). Human development discourses focusing on water and sanitation elicits the human rights and equity dimensions of access, ownership and control of both (UNDP, 2006; Harris, 2009).

Recent attention to the ‘hydrosocial cycle’ (Swyngedouw, 2006; Budds, 2008; Hawkins and Seager, 2010; Linton and Budds, 2014), which reflects water’s social nature and directs attention to how water is produced and how it is used (Linton and Budds, 2014), contributes to and draws on a prior literature on the gendered nature of environmental and resource relationships, including water. At policy-making levels, however, reluctance to take gender analysis seriously in what is seen as a ‘scientific’ field remains a problem across all environmental domains, not just in the water sector. Proof that the gender gap is still far from being closed has been provided by the publication of the 2017 Global Gender Gap Report (WEF, 2017). This flagship publication by the World Economic Forum (WEF) revealed that gender parity in 144 countries regressed for the first time since it was first measured in 2006. In other words, the gender gap has widened from 31.7 per cent in 2016 to 32 per cent in 2017. This reversal is mainly caused by an increasing gap in economic participation and the very slow, albeit static, progress in political representation. Economic participation, in this context, includes formal and informal paid employment, but excludes unpaid work of women, which constitutes an important economic contribution even though it is not explicitly valued in monetary terms. Moreover, taking up unpaid work, determines and limits the extent to which women can participate in other economic activities: engaging in unpaid work will leave them with less time and energy for other paid work, with respect to males who do not engage in such unpaid work (Manlosa and Matias, 2018).

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Gender parity is a statistical measure that provides a numerical value of female-to-male or girl-to-boy ratio for indicators such as income or education. For example, if there are equal number of girls and boys who completed primary education in a specific country, the gender parity ratio for that indicator is one. The greater the difference between girls and boys, the lower the gender parity value (Manlosa and Matias, 2018).
One has to bear in mind the difference between gender parity and equality: “Gender parity is a useful tool for assessing gender inequality in specific areas, in setting goals, and in assessing change and progress under specific indicators of gender equality... Achieving gender equality is about making a real difference in women’s lives, particularly in labour contexts. It involves a substantive shift not only in the proportion of men and women under specific indicators, but in the deeper dimensions of societal norms and sense of identities — to be valued and respected equally, regardless of gender. If gender equality is to be realized, efforts need to go beyond achieving statistics for gender parity.” (Manlosa and Matias, 2018, p. 2). Therefore, gender parity can be considered as a means of achieving gender equality, which is defined as “equal conditions to women and men for realizing their full human rights and for contributing to, and benefiting from, economic, social, cultural and political development. Gender equality is therefore the equal valuing by society of men and women, and the roles they play. It is based on women and men being full partners in their home, their community and their society” (UNESCO, 2003, p. 17).

To underline the full potential of benefits that can be achieved, a report by McKinsey Global Institute in 2015 estimated the economic benefits that can be reaped thanks to closing the parity gap: “A ‘best-in-region’ scenario in which all countries match the rate of improvement of the fastest-improving country in their region could add as much as US$12 trillion, or 11 per cent, in annual gross domestic product (GDP) by 2025. In a ‘full potential’ scenario in which women play an identical role in labour markets to that of men, as much as US$28 trillion, or 26 per cent, could be added to global annual GDP by 2025” (Woetzel et al., 2015).

The incremental but slow progress to push the issue of gender equality and gender analysis higher on the political agenda has been accelerated by UNESCO WWAP’s initiative on ‘Gender-Responsive Water Assessment, Monitoring and Reporting’, embodied by the 2015 and 2019 editions of the Toolkit, and by the findings of reports such as the Migration and its interdependencies with water scarcity, gender and youth employment (Miletto et al., 2017). The impact of its work has been promoted by the international recognition of the 2015 Toolkit, and its endorsement by the 23rd session of the Intergovernmental Council of the UNESCO International Hydrological Programme (IHP) (Resolution XXIII-2) for the adoption and dissemination by Member States.

2.2 COMBINING QUANTITATIVE AND QUALITATIVE INFORMATION

An indicator is a figure that summarizes a large amount of information while providing an indication of change over time, and may therefore allow comparison to a norm or baseline. Indicators can be quantitative or qualitative. Their value cannot be underestimated, as they permit efficient, empirical assessment of existing policies and programmes and to hold institutions and countries accountable by illustrating gaps between commitments and actual program outcomes (Chung et al., 2013).

Although the term ‘indicators’ connotes a quantitative approach, many of the gendered aspects of water, sanitation and hygiene (WASH) and water resources management are, in general, widely viewed as important and cannot be reduced, sensibly, to a single (or even a few) quantitative indicator(s). Various dimensions of ‘empowerment’ or even ‘equality’ are particularly complex to be captured quantitatively.

In 2005, former UN Secretary-General (1997–2006) Kofi Annan said “study after study has taught us that there is no tool for development more effective than the empowerment of women ... no policy is more important in preventing conflict, or in achieving reconciliation after conflict has ended” (AusAID, 2007; Porter, 2013). But what is women empowerment exactly? It could be defined as the process of giving women the same ability as men to make choices. “To be disempowered means to be denied choice, while empowerment refers to the processes by which those who have been denied the ability to make choices acquire such ability. In other words, empowerment entails change.” (Kabeer, 2005, pp. 13–14).

Empowerment measures often are boiled down to ‘counting heads’ — an undeniably important indicator — for achieving parity for instance-, but not the same as ‘empowerment’ as described above. Often women attend meetings or sit on councils, but make limited or occasional interventions: depending on the context, they may be hesitant due to lack of
confidence; or, if they speak, they are not attentively listened to, are dismissed as being presumptuous or are assumed to lack expertise. Sometimes, the content of their discussions or negotiations may not necessarily be acknowledging and addressing gender inequalities thus not promoting gender equality. Therefore, it is evident that women are not necessarily 'empowered' by merely being appointed to a council or authority body. This may be a necessary step, but also a not sufficient one.

Quantitative methods alone can at times perform meagrely in capturing the nuances of gender power relations and established (unequal) power structures (UN DESA, 2010). The multidimensional and cross-cutting nature of empowerment implies that empowerment in one domain may not result in the empowerment of another. Furthermore, the process of empowerment is cultural- and context-specific and varies over time. For instance, a women's lower status may impede a certain opportunity, i.e. employment, in one context and may constrain them to a low wage in another. Concurrently with other social inequities, such as class, ethnicity, religion or other factors, empowerment can become increasingly complex. As quantitative measurements may not allow the measurement of the complex process of empowerment, quantitative and more participatory qualitative approaches, tailored to the specific contexts, may appear more suitable (Raj et al., 2017).

Such nuances, especially in the case of sensitive topics, can indeed only be captured through the use of qualitative methods, which include interviews, analyses of documents and participant observation data, in order to understand and explain social phenomena or to collect data on specific dimensions of gender. Case studies, ethnographical research, narrative and descriptive qualitative approaches can provide evidence and contextualized insight across a range of participants' personal characteristics, including gender. In order to perform a qualitative research, a variety of approaches and methods may be employed, such as open-ended interviews, oral histories or life stories, focus group discussions, or participant observation (INSTRAW, n.d.; Tannenbaum et al., 2016). These various approaches will be discussed in the next sections.

Gender analysis should reflect the realities of women's and men's lives (see Box 2, for example). Information about socio-economic processes and power dynamics are often best elicited through qualitative approaches. Because of the dominant paradigm of the water sector is a technical-scientific rather than a social field, there is a widespread, although erroneous, perception that qualitative data are less serious, less reliable, less relevant, anecdotal or ad hoc. Despite this scepticism, robust participatory and interview-based methodologies have been developed to spot qualitative, experiential or ‘lived’ realities. Those methods usually yield rich narratives, subjectively oriented and sometimes distinctly personal information, that are nevertheless indispensable from a gender mainstreaming perspective.

This, however, immediately raises the problem of how qualitative narrative and quantitative indicators can be combined into a coherent, useful whole. A 2006 Working Paper summed up the dilemma: “At the same time, however, precise figures to establish the extent of gender gaps between rights and responsibilities, and to quantify the masculinity of water education and professions, are often lacking. Within water analyses, the information about gendered divisions in labour, rights and voice [in water] and about numbers of students and professionals is often not routinely collected. Regular water databases likewise do not normally include this type of information. On the other hand, most gendered water information is available in the form of anthropological case studies which provide in-depth accounts of gendered divisions of labour, rights and responsibilities as linked to gendered identities and structures, and that allow for nuanced understandings of the shifting and contested meanings of gender. The knowledge and information generated through such gender analyses are often not in a format and form that is easily used by water researchers. There is, in other words, a lack of congruence between the information that water analysts and policy-makers need and the type of knowledge produced by gender analysts.” (CA/GWA/BE, 2006, pp. 13–14).

Such a context is a philosophical as well as a methodological challenge. It is not fully intractable, although it often seems so. Many researchers use qualitative information to validate and ‘flesh out’ quantitative data. For example, the Women’s Empowerment in Agriculture Index is premised on complementing quantitative data with qualitative methods for meaning and interpretation (Alkire et al., 2013).

One technique recently developed is the ‘Methodology for Participatory Assessment’ (MPA) approach, also called ‘Qualitative Information System’ (QIS) which, in effect, quantifies qualitative information. It was originally developed by the Water and Sanitation Program (WSP) and the International Reference Centre on Community Water Supply (IRC) as a participatory tool to monitor qualitative performance of water services in a quantitative way over time and
Box 2. Example of sex-disaggregated data enquiry

In 2017, intra-household (HH) gender surveys were carried out in Botswana and Namibia within the Stampriet Transboundary Aquifer as part of GGRETA (Phase II), a project led by UNESCO-IHP and financed by the Swiss Agency for Development and Cooperation (SDC). For the first time ever in the assessment of transboundary aquifers, the study aimed at incorporating elements related to gender equality and the role of women in the use, management, and decision-making of groundwater resources, based on the scientific evidence of sex-disaggregated water data collected in the field. The HH surveys adopted the 2015 WWAP Toolkit on Sex-disaggregated Water Data Collection, including its priority gender-responsive indicators.

The Toolkit was tested in two different settings: the village of Ncojane in Botswana, and the extensive area of commercial farms of Stampriet town, in Namibia. The figure below shows an example of the responses of women and men in Ncojane regarding who are mainly responsible for the quality of domestic water in the HH. It shows that both women and men agree that women are those mainly responsible. However, some younger respondents (between 21–35 years old) considered it a shared responsibility, while 100% of the older respondents (>65 years old) considered it a women’s task. These data demonstrate the importance not only of sex but also of age in the disaggregation of data.

Who is responsible for the quality of domestic water in the HH?

Source: Based on a field research by WWAP as part of the GGRETA project (2017).

The field survey confirmed the prevalent role of women as responsible for the water quality and supply within the household boundaries (domestic use), and of men as responsible of the productive uses of water (e.g. livestock, agriculture, etc.).

A recent study makes use of both quantitative, participatory approaches as well as qualitative methods in natural resources research (Nchanji et al., 2017)... In another, “the methodology uses scenario scales on which representative community groups score the quality of programme planning and execution against service performance (i.e. a development programme)...This enables both communities and programmes to compare the quality of implementation with the quality of service delivery and to make improvements.” (IRC, 2013). The MPA approach revealed that a more local decision-making by a more representative, accountable and well-trained local management (women and men), gave better performance results in the following years (WSP, 2000; IRC, 2013).
Other methodologies focus on measuring the ‘intensity’ of participation or on developing qualitative ordinal or ranked scales (van Wijk-Sijbesma, 2001; Nightingale, 2002; van Koppen, 2002a; Postma et al., 2003, Gyau et al., 2016). Two studies investigated the factors responsible for the intensity in women’s efforts to participate within joint coffee and microfinance co-operatives (zu Selhausen, 2012 and 2016). Some of the factors identified as determining participation intensity were, for example, more equal spousal/household power relations, joint land ownership, access to extension services and, to a lesser extent, income level, literacy, membership duration, and trust between members of the co-operative. The work of other authors (Van Koppen, 2002a; Van Koppen et al., 2012) explores the development of a specific gender and water index for integrated water management that will ensure greater gender equality by allowing describing, comparing and monitoring basins or other water management units from a gender perspective. The index in question would form a support tool for decision-making by capturing complex phenomena, such as gender relations and other social components, therefore facilitating the assessment of policies. It also takes into consideration women’s equal participation and the intensity of their participation in paid and unpaid water-related decision-making as one of the attributes for the development of the index. The level of participation, or degree of inclusion or exclusion, may be specified, as well as the reasons identified (van Koppen, 2002b, p. 12).

2.3 COMBINING MACRO AND MICRO DATA

The virtues of small-scale data are well known. As the 2008 UN DESA Expert Group on Sex-disaggregated Data affirmed, the smaller scale often provides the most appropriate and fruitful information. Data on local and small-scale interventions (and their outcome and impact) with respect to gender provide a concrete knowledge base on the effectiveness of water sector policies and processes towards advancing women’s empowerment and gender equality. Small-scale efforts can inform and test survey methods and other techniques that subsequently may be applied at a larger scale. It also provides the basis to assess the state of gender equality and the status of women and men in the local community (UN DESA/UNW-DPC, 2009; OSCE, 2015). Local data provides the basis of most of the current knowledge that we have on engendering water and sanitation.

In order to inform policy and increase capacity at the local, regional and transboundary levels, it is not necessarily suitable to collect globally-uniform data, which can erase important locally-differentiated information. Despite this, it largely remains the case that progress in policy typically rests on a foundation of broad information and a ‘one-size-fits-all’ approach. Transitioning between scales, or integrating data collected at varying scales, is a complex task which needs further attention and methodological work. Large-scale data collection efforts get bogged down at the small scale. An aggregation of small-scale data results does not necessarily (or always) add up to a universal view, but can inform and validate survey methods and techniques which then may be applied at a larger scale. From this perspective, solid and easily applicable baseline methodologies for the collection of data that can be applied in different situations and in various locations are of considerable value. Similarly, the WWAP Water and Gender Toolkit, in line with the 2014–2021 UNESCO Global Priority Gender Equality Plan (UNESCO, 2014) and the SDGs, aims to develop a context-specific knowledge base for gender equality.

Whereas it is generally assumed that globally-uniform data can erase important locally-differentiated information, big data can nevertheless present a great opportunity to make available relevant gender and water data (UN Women, 2018). Briefly stated, big data are extremely large data sets, produced unintentionally and in real-time as a by-product of people’s digital behaviour through a number of different digital channels (internet, radio, audio, text). Its unorganized nature, however, poses a challenge for processing and interpretation, making the use of new data analysis techniques necessary to reveal patterns, trends and associations relating to human behaviour and interactions containing valuable gender-related information. Nonetheless, big data can provide valuable insights and can play an essential and vital role in the achievement and monitoring of the 2030 Agenda, including SDG 5 (UN Women, 2018).
2.4 THE INCOMPARABILITY OF INEQUALITY

An issue related to the qualitative/quantitative enigma is the comparability dilemma in measuring ‘inequality’ or ‘empowerment’, which are almost inherently relative terms. ‘Injustices’ or ‘inequalities’ usually emerge from certain context-specific conditions. In the case of gender inequality, this unbalance can be partially or entirely on the basis of the gender. The issue mainly arises due to the differences in socially-constructed and accepted roles in gender and has implications for the political, social, economic or any other aspect of the lives of women versus men (Women Unlimited, 2017).

The Gender Equality Observatory for Latin America and the Caribbean, for example, offers this cautionary note: “In order to define a policy as fair from the gender perspective, it is necessary to consider what justice and for whom. … Gender injustice cannot be attributed to a single factor, and this is why gender demands are based on economic injustice but also injustices of recognition and in relation to the organization of political action and decision making. … It is possible to analyse three dimensions of the current social order in which justice must be done: redistribution, recognition and representation. Although these dimensions are clearly interlinked, they can also be analysed separately.” (UNECLAC, 2012, p. 4). In addition, gender should not be considered in isolation as various forms of social stratification, such as class, race, sexual orientation, age, religion, etc. are interwoven together (hooks, 1987).

The experience of inequality and discrimination — and, the obverse, of empowerment — is also excruciatingly local and personal. However, there exist a number of measures and indices (See Box 3 for some examples) that aim to assess gender (in)equality. Of these, the Gender Inequality Index (GII) created in 1990 is one of the most known (UNDP, n.d.a.). The GII sheds new light on the position of women in 160 countries, highlighting areas in need of critical policy intervention and stimulating proactive thinking and public policy to overcome systematic disadvantages of women. The GII is built on the same framework as the Inequality-adjusted Human Development Index (IHDI) to better expose differences in the distribution of achievements between women and men (UNDP, n.d.b). It measures the human development costs of gender inequality: the higher the GII value, the more disparities between females and males and the more loss to human development.

Philosophically, it could be concluded that there is no single measure or set of measures that will capture aspects of water-based gender inequality in the same way in Fiji as in Gabon, in Canada or in Iran. Methodologically, however, we can develop best-practice data surrogates that can measure and explain gender-based inequalities. For example, the ‘masculinization’ of the water sector at formal levels (in education tracks, engineering, large-scale water projects, etc.) is well known and immediately recognizable to women who work in this sector.

Measuring ‘masculinization’ (which is both an institutional and cultural phenomenon) per se is almost impossible. In this case, surrogate data can be used to identify and explain broad cultural concepts such as ‘hegemonic masculinization’. A way of quantifying the phenomenon of masculinization can be, for example, the percentage of women and men in university degree programmes, or of women and men in positions of authority in water boards. Similarly, bridging national identities and cultures to measure ‘inequality’ is in itself almost impossible, but the use of surrogate data can yield powerful insights that, after analysis, can be explained in an expanded narrative.

In simple terms, the percentage of women and men in university level engineering degree programmes could explain the ‘lack of qualified’ women in water-related jobs, hence also indicating the lack of access to higher education for women in disciplines identified as masculine in some cultures. Therefore, it is important to keep in mind the context within which the analysis is being done, so cultural phenomena can be identified and addressed in order for gender-transformative action to be achieved.

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4 In this context, masculinization refers to the development of behavioural predispositions in line with what is considered typical or socially conform male behaviour.

5 The term ‘hegemonic masculinities’ appeared in an article by Connell and Messerschmidt first in 1995 and a re-edited version in 2005 (Connell and Messerschmidt, 2005). The authors described it to explain how and why men maintain dominant social roles over women, and other gender identities, which are perceived as ‘feminine’ in a given society and time.
Box 3. Examples of indices and measures of gender inequality

<table>
<thead>
<tr>
<th>INDEX</th>
<th>CHARACTERISTICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender Inequality Index (GII)</td>
<td>Measures gender inequalities in reproductive health, empowerment and economic status</td>
</tr>
<tr>
<td>Inequality-adjusted Human Development Index (IHDI)</td>
<td>Measures the human development costs of gender inequality</td>
</tr>
<tr>
<td>Women’s Empowerment in Agriculture Index (WEAI)</td>
<td>Identifies areas of disempowerment and design development programmes to address those areas</td>
</tr>
<tr>
<td>Gender and Development Index (GDI)</td>
<td>Draws how much women are lagging behind their male counterparts and how much women need to catch up within each dimension of human development. It is useful for understanding the real gender gap in human development achievements and is informative to design policy tools to close the gap</td>
</tr>
<tr>
<td>Gender Evaluation Methodology (GEM)</td>
<td>Integrates gender analysis into evaluations of initiatives that uses information communication technologies for social change</td>
</tr>
<tr>
<td>Gender Equality Index (GEI)</td>
<td>Measures gender gaps between women and men in the European Union. It considers gaps that are to the detriment of either women or men as being equally problematic</td>
</tr>
<tr>
<td>Social Institutions and Gender Index (SIGI)</td>
<td>Addresses gaps that legislation, social norms and practices create between women and men in terms of rights and opportunities</td>
</tr>
</tbody>
</table>

The analysis undertaken by the authors of *Water Security Across the Gender Divide* (Fröhlich et al., 2018) underlined the value of including context-specific analyses in gender studies. Their work implemented a multi-layered approach that acknowledges the interconnection of phenomena at different levels (micro to meta) in environmental, economic, political and social issues to study the underlying causes of gender-differentiated roles and responsibilities. Further research is recommended to ‘scale up’ the insights of intersectionalities in order to examine macro-level phenomena and to avoid over-generalization. This will yield much needed data on water accessibility, availability and utilization, and acknowledge to a larger extent the relational nature of gender and other socio-economic factors.

On the other hand, it has also been found that women who work in jobs generally identified as masculine develop certain coping strategies in order to gain male acceptance such as portraying masculine behaviour, achieving a reputation, or even accepting gender discrimination and adopting an ‘anti-woman’ approach. These strategies fail to value femaleness and do nothing to challenge the gendered culture of engineering. On the contrary, it can even contribute to maintaining an environment that is hostile to women (Powell et al., 2009).

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6 For more information, please visit: hdr.undp.org/en/content/gender-inequality-index-gii
7 For more information, please visit: hdr.undp.org/en/content/inequality-adjusted-human-development-index-ihdi
8 For more information, please visit: weai.ifpri.info
9 For more information, please visit: hdr.undp.org/en/content/gender-development-index-gdi
10 For more information, please visit: www.genderevaluation.net/?q=gemworks/gender-analysis
11 For more information, please visit: eige.europa.eu/gender-equality-index/about
12 For more information, please visit: www.genderindex.org
2.5 LIFTING THE ROOF OFF THE HOUSEHOLD

It is generally accepted by gender analysts that the household is not a single decision-making unit (Devkota, 1999; Devkota et al. 1999; IFPRI, 2003; Grossbard, 2011). The household includes female and male members of different ages, who hold different positions of power and responsibilities, and who have different priorities and needs. The manner in which they interact with each other in order to negotiate decisions, priorities and allocation of resources and benefits reflects the gendered-powered relations and norms of that household. These intra-household processes provide valuable information and insights for gender analysis within a given context, especially since it is one of the main places where gender roles are constructed, defined, maintained and challenged.

Another compelling reason to keep a steady analytical focus at the inside-the-household level is because the public/private division is one of the key social and economic structures that maintains and reproduces gender inequality. To the extent that the private sphere is considered to be less important economically, environmentally and politically than the public sphere, the gendered association of women with ‘private’ and men with ‘public’ has tremendous importance. The findings of a 2010 study highlight the importance of intra-household decision-making “… to the welfare of the individuals living in it as well as their communities. Decisions such as where to live, how to generate income, how much to invest and consume, and how many children to have are common dilemmas faced by households, [which] outcomes are often linked to economic performance at the household level as well as in the aggregate for the country as a whole.” (Angel-Urdinola and Wodon, 2010, p. 381). Given that much of women’s work occurs inside the household, and usually unpaid, breaking down the walls of privacy that surround the household allows a clearer view of the economic and often uncounted economic contributions of women.

Who heads the household has, however, significant implications. It is, for example, often argued that a larger voice of women in financial matter tends to favour human capital investment such as education of children or better nutrition outcomes (Blackden and Bhanu, 1999; World Bank, 2001; Backiny-Yetna and Wodon, 2010). It must however be kept in mind that households are not fixed units with defined boundaries as its social and asset boundaries are permeable and changeable. For instance, the composition of households may change over time.
3 METHODS OF DATA COLLECTION

Researcher collecting data on the field in Yen Bai, Viet Nam. © Georgina Smith, CIAT; www.flickr.com; (CC BY-NC-SA 2.0).
As described more extensively in Tool 1 – Gender-responsive Indicators for water assessment, monitoring and reporting, the lack of sex-disaggregated water data is a major obstacle to the production of scientific evidence on gender inequalities related to water and to the formulation of gender-transformative policies that enable women to have an effective ‘voice’ in meaningful participation mechanisms, in job and capacity development opportunities.

This gap has been widely acknowledged, for example in SDG 17 of the 2030 Agenda for Sustainable Development, which calls to increase significantly the availability of high-quality, timely and reliable data disaggregated by gender, among others. Another example is UNESCO’s Priority Gender Equality Action Plan 2014–2021, through which it commits to improving the baseline knowledge on gender equality initiatives through the collection of evidence-based systematic data and information (UNESCO, 2014).

Tool 3 – Guidelines on the collection of sex-disaggregated data provides a detailed description and step-to-step guidance on how to collect sex-disaggregated water data in line with the WWAP indicators, in the field.

This chapter provides a brief and theoretical overview of the most common methods of data collection and their applicability to the collection of sex-disaggregated water data.

### 3.1 QUALITATIVE AND QUANTITATIVE DATA

In general, there are two types of data collection methods: quantitative and qualitative. Quantitative data is often used as the basis for understanding a context and to assess change, but its usefulness for understanding the dynamics of economic, political and social relations as well as for highlighting diversities and inequalities at national level may be limited (SDC, 2006). Methods for the collection of quantitative data include household surveys, socio-economic surveys, perception and attitude surveys. Qualitative data, on the other hand, can include non-quantifiable information, such as gender power relations, norms and their implications as expressed in laws, customary practice, etc., and therefore cannot always be expressed as a number (SIDA, 2015; Morgan et al., 2016). Qualitative data collection methods include stakeholder analysis, focus group interviews, community workshops, task analysis, etc.

The assessment of gender dimensions, in particular, requires specific methodological approaches, such as:

- a literature study or desk research for orientation, pre-assessment and up to a certain extent the collection of data;
- a multi-encounter study (i.e. a single meeting is not a sufficient basis for judgment);
- semi-structured and open interviews with women and men participating in the meetings/committees to assess their experiences of participation; and
- participant observation: sending an observer to attend sessions of meetings of the board, panel, or organization (recording their opinions, perceptions, beliefs, customs etc. through the use of questionnaires).
Observation methods can generate quantitative as well as qualitative information depending on the protocols used. Quantitative and qualitative survey methods have their own strengths and weaknesses. The consideration of gender-related quantitative data along with qualitative data may facilitate its interpretation to better approach the situation in the field and to provide more comprehensive information for gender analysis. Doing so will improve the identification of gender issues, help the diagnosis of opportunities to solve them, and inform the subsequent monitoring and evaluation. This can be done in practice by a combination of one-to-one interviews or as issue-directed discussions (SDC, 2006; Jamshed, 2014). Therefore, ideally, a gender analysis should include a combination of statistics, descriptions, facts and analysis. In addition, the combination of information with a macro and a micro perspective might yield significant benefits to the analysis (SIDA, 2015).

Methods are usually selected on the basis of the type of information required, purpose of data collection and its uses. Budget and time constraints are also important considerations.

### 3.2 FACT-FINDING

Interviews are among the most common social science methods to solicit qualitative (but also quantitative) information (Parsons, 2008). Formally, interviews tend to follow one of three forms: unstructured, semi-structured and structured. As the names suggest, these interview types reflect a range from relatively free-flowing conversation that is only loosely tied to a predetermined script or questionnaire (‘unstructured’), to a tightly-scripted, fact-finding instrument (‘structured’). Alternatively, the interviewer is able to follow topical trajectories in the conversation that may stray from the questionnaire when he or she feels this is appropriate (‘semi-structured’) (McNeill and Chapman, 2005).

To gather data on the wide range of sex-disaggregated water topics will require interviews with a variety of people, including key informants and respondents. Structured interviews might be conducted with a wide range of interviewees such as government officials and their staff, women’s groups, associations, unions and related organizations, non-governmental organizations (NGOs), and academia, in order to obtain ‘factual’ information about matters such as the presence and nature of gender-specific objectives and commitments (or gender strategies) in national- and sector-level water policies, or what budget allocations, if any, are made at the national level for gender mainstreaming in water and sanitation. Sometimes, this kind of information is available from written official records, but even in that case there is value in having additional interviews as it may provide clues in identifying the appropriate written source(s) or contextual information for those sources. The next section provides some examples from Tools 1 and 4 of how official records can help gather data.

### 1. GENDER-RESPONSIVE WATER GOVERNANCE

**1a Gender-responsive water policy frameworks**

1a.1. Number and percentage of regional, national, sub-national and sectoral water policy frameworks that are gender-sensitive/responsive/translormative\(^1\) and status of implementation (such as planning phase, early implementation and full implementation).

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\(^1\) 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).
1a.iii. Measures for creating public awareness regarding gender-specific content in water policy frameworks; evidence of implementation of measures.

1b. Gender-responsive management in water governance institutions

1b.i. Number of Female/Male (F/M) staff in different job positions (levels), field of job, and salaries (scales) in (a) national ministries that deal with water resources, and (b) in public/private utilities and commissions for water-related services.

1c. Gender-responsive implementation of water programmes and projects

1c.i. Percentage of budget allocation, and procedures for collection and analysis of sex-disaggregated social, economic and livelihoods data of local populations when planning for national, sub-national and sectoral water programmes and projects; number of programmes and projects that followed these procedures.

2. SAFE DRINKING WATER, SANITATION AND HYGIENE

2a. Household access to safe water for drinking and domestic use

2a.i. Number of F/M registered subscribers/consumers/users connected to piped water supply disaggregated by geographical location of the house within the survey area.

2c. Household access to safe sanitation and hygiene

2c.iv. F/M access to formal/informal credit or government/non-government subsidies for: a) building and maintaining a sanitation facility including a handwashing facility with soap and water, b) building and maintaining a sewage disposal system.

4. TRANSBOUNDARY WATER MANAGEMENT

4b. Gender-responsive transboundary water programmes and projects

4b.i. Number and percentage of transboundary water projects and programmes that collected and reviewed sex-disaggregated social, economic, livelihoods data in the region/area, and consultations with F/M in local populations before planning for infrastructure investments; reasons for reviewing/not reviewing sex-disaggregated data of and consultations with local populations.

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14 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.

15 Such as drinking water, sanitation, wastewater, watershed management, irrigation, environment.

16 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.

17 Location refers to the neighbourhood/community/locality within the city/town/peri-urban/rural area/village. This is an indicator for social inclusion.
4b.ii. Number of transboundary water management (TWM) agreements, projects and programmes that included either cooperation mechanisms or social and environmental safeguards to protect local F/M livelihoods. Nature of the cooperation mechanisms and safeguards; accountability mechanisms for ensuring implementation; status of implementation.

7. HUMAN RIGHTS-BASED WATER RESOURCES MANAGEMENT

7a. Gender-responsive governance framework and implementation of the human rights to water

7a.i. Evidence of State ratification, commitments and implementation of actions, related to human rights charters relevant to water and sanitation in policy frameworks, and policies of public/private utilities and commissions for water services, such as water allocation priorities for water, sanitation and hygiene, and creating accessibility for the most vulnerable. (F/M who are differently abled, in migrant and displaced populations, refugee camps and shelters, Indigenous Peoples, ethnic minorities, vulnerable neighbourhoods, communities and localities.)

8. WATER, MIGRATION, DISPLACEMENT AND CLIMATE CHANGE

8i. Number of household/community members disaggregated by sex and age who have permanently migrated, displaced or relocated due to impact on freshwater systems, coastal ecosystems, groundwater caused by climate vulnerability or climatic variability in the survey area.

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18 On 28 July 2010, through Resolution 64/292 (UNGA, 2010), the United Nations General Assembly explicitly recognized the human rights to water and sanitation and acknowledged that clean drinking water and sanitation are essential to the realisation of all human rights. The resolution, adopted by consensus by the Human Rights Council, affirms that the right to water and sanitation are part of existing international law. This body has therefore confirmed that these rights are legally binding upon States. States Parties to the International Covenant on Economic, Social and Cultural Rights can no longer deny their responsibility to provide safe water and sanitation for all individuals.

19 Actions include measures taken for the implementation of policies.


21 Migration from rural to urban and versa, within rural or urban locations, within the country or outside.

22 Climate change refers to any change in climate over time, whether due to natural variability or as a result of human activity. This usage differs from that in the United Nations Framework Convention on Climate Change (UNFCCC), which defines "climate change" as: "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods" (IPCC, 2007a, p. 78).

23 Climate-induced migrations, either permanent, long-term or seasonal, are responses to 'extensive climate risks', as reported in many studies on individuals and households that migrated due to risks related to rainfall variability and livelihood insecurity (Warner and Afifi, 2014, cited in Wilkinson et al., 2016). Instead, climate-induced displacements happen when people move suddenly and temporarily in the face of hydrological natural disasters (intensive climate risks) which make up for 90% of all natural disasters (WWAP, 2012). It is often, however, the case that due to the perception of likely future risks, people's displacements become permanent. (Warner, 2010).

24 Vulnerability to climate change is the degree to which geophysical, biological and socio-economic systems are susceptible to, and unable to cope with, adverse impacts of climate change (Füssel and Klein, 2006). The term 'vulnerability' may therefore refer to the vulnerable system itself, e.g., low-lying islands or coastal cities; the impact to this system, e.g., flooding of coastal cities and agricultural lands or forced migration; or the mechanism causing these impacts, i.e., disintegration of the West Antarctic ice sheet (IPCC, 2007b).

25 Climate variability refers to variations in the mean state and other statistics (such as standard deviations, statistics of extremes, etc.) of the climate on all temporal and spatial scales beyond that of individual weather events. Variability may be due to natural internal processes within the climate system (internal variability), or to variations in natural or anthropogenic external forcing (external variability) (IPCC, 2007a).
10. WATER EDUCATION AND TRAINING

10a F/M access to skill development for career enhancement

10a.i. Official policies of (a) national ministries that deal with water resources,26 (b) in public/private utilities and commissions for water-related services,27 (c) water-related industry and enterprise with regard to provision of technical and vocational training28 for F/M staff/employees for skill development and career enhancement in different job positions and type of jobs; evidence of implementation of the policies; feedback from F/M staff/employees.

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 resources29, (b) in public/private utilities and commissions for water-related services10, (c) water-related industry and enterprise; feedback on the usefulness of the training from F/M trainees.

10d F/M access to skill development at community level

10d.i. Number of F/M farmers and community members who have received technical training related to water management from government/non-government institutes or organizations; constraints to participation by F/M trainees; and reasons and solutions for constraints.

It is noteworthy to mention that official records, although often considered to be among the most reliable sources of data, are sometimes subject to error, misinterpretation and/or incompleteness, especially in terms of gender representation. Where needed, and where possible, one may enquire how the data were obtained and processed. One of the advantages of conducting an extended pilot study is that the obtained field data can be compared with the official accounts.

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26 Such as drinking water, sanitation, wastewater, watershed management, irrigation, environment.
27 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.
28 Apprenticeship Training (AT), Vocational Education (VE), Technical Education (TE), Technical-Vocational Education (TVE), Occupational Education (OE), Vocational Education and Training (VET), Professional and Vocational Education (PVE), Career and Technical Education (CTE), Workforce Education (WE), Workplace Education (WE), etc., as applicable (UNESCO, n.d.).
29 Such as drinking water, sanitation, wastewater, watershed management, irrigation, environment.
30 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.
The suggested methodology is intended to probe gender equality beyond counting the presence of women and men in decision-making bodies and governance structures. Several UNESCO WWAP conceptual indicators include assessment of the actual participation and effectiveness of gender representation, such as:

1b. Gender-responsive management in water governance institutions

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, and (b) public/private utilities and commissions for water-related services; reasons for participation/non-participation; proportion of F/M participation; number of gender-specific decisions adopted resulting from contributions made by F/M participants.

1d. F/M participation in local or community, formal and informal water institutions

1d.i. F/M membership with position and responsibility in local or community formal and informal institutions, for managing irrigation or water supply.

1d.ii. Participation by F/M members (with position) in decision-making meetings in local or community, formal and informal institutions for managing irrigation and water supply; reasons for participation/non-participation; proportion of F/M participation; number of gender-specific decisions adopted resulting from contributions made by F/M members.

3b. Outputs from water-related scientific panels and advisory boards

3b.ii. F/M membership with positions and area of work on nationally, regionally and internationally convened water-related scientific panels and advisory boards, including those related to climate change adaptation and mitigation.

33 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.

34 Such as drinking water, sanitation, wastewater, watershed management, irrigation, environment.

35 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.

36 Gender-sensitive/responsive/transformative decisions in general and decisions addressing specific gender issues in particular.

37 Ordinary member/committee member/board member.

38 Technical maintenance, upkeep, day-to-day operations.

39 Registered organizations/legal entities such as water users associations.

40 Non-registered groups of community members/farmers.

41 Gender-sensitive/responsive/transformative decisions.

42 Climate change adaptation and mitigation will be treated separately in Tool 4 – Questionnaire for the collection of sex-disaggregated water data.
3b.iii. Participation/non-participation with reasons, by F/M members (position) in decision-making meetings in nationally and internationally convened water-related scientific panels and advisory boards, including those related to climate change adaptation and mitigation; proportion of F/M participation; and number and nature of gender-specific decisions, documents, messages, advisories, resulting from F/M contribution.

4. TRANSBOUNDARY WATER MANAGEMENT

4a Gender-responsive governance in national/international water authorities and commissions that deal with transboundary waters

4a.i. Number and percentage of transboundary water projects and programmes that collected and reviewed sex-disaggregated social, economic, livelihoods data in the transboundary basin, sub-basin, region/area, and consultations with F/M in local populations before planning for infrastructure investments; reasons for reviewing/not reviewing sex-disaggregated data of and consultations with local populations.

4a.ii. Participation by F/M staff/board members/committee members with a position in decision-making processes in national/international water authorities and commissions that deal with transboundary waters; F/M reasons for participation/non-participation in the decision-making process; proportion of F/M participation; number and nature of gender-specific decisions resulting from F/M contribution to decision-making.

6. WATER FOR INDUSTRY AND ENTERPRISE

6a Gender-responsive management in water-related industries and enterprises

6a.iv. Participation by F/M employees/board members/committee members with position in decision-making processes; F/M reasons for participation/non-participation in decision-making; proportion of F/M participation; number and nature of gender-specific decisions resulting from F/M contributions.

These conceptual indicators are intended to reveal the gendered power relations within formal and informal structures, boards, panels and meetings, and in local/national/international organizations and institutions.

Gender participation-intensity methodologies have been developed in the last two decades and are still under development, but examples of similar efforts and guidance on methodology is increasingly available (van Wijk-Sijbesma, 2001; Nightingale, 2002; Postma et al., 2003; Dyer, 2018). At its heart, ‘gender-equity intensity’ assessments are based on direct observation by a skilled observer.

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41 Climate change adaptation and mitigation will be treated separately in the questionnaire.

42 Gender-sensitive/responsive(transformative decisions.

43 Such as national level River Commissions.

44 Such as Joint River Commissions.

45 Gender-sensitive/responsive(transformative decisions.

46 Idem.
Direct observation is a powerful and well-established technique. As with semi-structured interviews, the observer is typically prepared with an advance slate of observation points to record, but s/he must also be on the alert for invisible dimensions of behaviour and activity that might not be included in the script. An observer of meetings, for example, might know in advance that s/he should look for dynamics, as outlined below, while being equipped to recognize, understand and address her/his own bias (Meyers and Jones, 2012):

During an organizational, programme or project meeting, one should consider the following:

- What is the ratio of F/M participants in the meeting?
- Is anyone dominating the meeting? Who is speaking more? Women or men?
- Does everyone seem to be comfortable participating?
- Does it appear that everyone’s opinions and insights are respected when they speak?
- Who attends community gatherings and who does not? Who plays a leadership role within the community or speaks at village gatherings and who does not?
- Where and at what time is the village gathering held? Is the time and location suitable for everyone?
- Who is treated with respect? Who is not?
- How is the follow-up of what was agreed during the meeting? Are the suggestions made by women and men put into action?

A recent study points out the importance of understanding cultural- and gender-specific communicative practices, as these may expose and explain the gendered characteristics of particular meeting styles (Dyer, 2018). The application of the analytical method used in the Gantt charts was indicated as a strategy to determine the gender aspects of participation, and to understand culturally and gender-specific communicative practices, usually geo-characteristic. The analysis took into consideration: (i) how many people contributed; (ii) role of the chair; (iii) frequency of individual contributions; (iv) length of individual contributions; (v) overlapping contributions; and (vi) general volume level of the meeting. Clear differences were found between women-only, men-only, and mixed meetings in terms of topics discussed, style of discussion, type and number of interventions, and other features (laughter, parallel discussions, etc.). More specifically, it was found that the presence of men in women’s meetings had a much more significant impact on the meeting’s practice, than the presence of women in men’s meetings did. The proposed methodology identifies how to allow space for transformative meeting practices that suitable for transform the characteristically social power dynamics according to cultural norms.

To summarise, the process of participant observation entails establishing a relationship within a community and to blend into the community so that its members will act naturally, then removing oneself from the setting or community to immerse oneself in the data to understand what is going on and be able to write about it (Bernard, 1994).

3.4 HOUSEHOLD AND INTRA-HOUSEHOLD SURVEYS

Most household and personal surveys are conducted as ‘semi-structured’ interviews. Essentially, this means that the interviewer follows a script or predefined set of questions, but will also ask additional follow-up questions as they naturally arise in the conversation. Those follow-up turns in the conversation cannot be anticipated or scripted. As a general information-gathering approach, ‘unstructured’ or ‘semi-structured’ interviews can be used, as these resemble more natural conversations, encourage a rapport between the interviewee and interviewer, and tend to be more suitable for sensitive topics.
There have been a number of studies of gendered responses to various interview settings, where women respondents tend to prefer and to provide more (nuanced) information through semi-structured or unstructured approaches (Oakley, 1981; DeVault and Gross, 2012). One must, however, bear in mind that unstructured interviews are highly susceptible to a variety of biases and must avoid at all cost asking leading questions to the interviewee. It is highly recommendable to record the interview as note-taking may be obtrusive and distracting (Oltmann, 2016).

Household and personal surveys require a considerable commitment of time and tact. There is substantial methodological literature on gender-sensitive or responsive household surveying, including directives about facilitating techniques, such as matching the sex of the respondent and the interviewer depending on the context (i.e. men interview men, women interview women), maintaining confidentiality, and setting enabling conditions that give women opportunities to speak freely (ICF International, 2012a and 2012b; Dyer, 2018; IHSN, n.d.). When attempting to elicit (perhaps sensitive) information from female household respondents, it is particularly important that a husband or male family member does not attend or proactively participate in the interview.

One of the gender pitfalls of many household surveys is the concept of ‘head of household’, whereby a single respondent — typically male — is assumed to speak ‘for’ the entire household, leading to biased results. This practice can easily obscure a number of gender-relevant dynamics. For example, the household may be made up of several adults of various relationships, not always connected in a straight line to the (male) ‘head’. In addition to this, it is unlikely to assume that all members of the household share the exact same opinion of the head of household.

There exists an exhaustive methodological literature on ways to categorize households and intra-household relationships other than by the sex of the household head (UNECE/World Bank Institute, 2010). Many of these require a substantial reconceptualization of census and survey forms, retraining survey-takers, and developing new conceptual frames. However, the rich rewards of doing so can be seen in those studies that do take an intra-household approach.

A more comprehensive guidance to these methodologies for carrying out surveys and the related analysis can be found in Tool 3 ‘Guidelines for the collection of sex-disaggregated water data’.
CONCLUSIONS
UNESCO WWAP is committed to advancing women’s empowerment and gender equality in water resources management and governance, in full alignment with the UNESCO global priority on gender equality. To this purpose, WWAP has developed a methodology to tackle the global data gap on water and gender.

The UNESCO WWAP Toolkit on Sex-disaggregated Water Data fulfils a need for practical tools for freshwater assessments using gender-responsive indicators to gather qualitative and quantitative sex-disaggregated water data. It has received official recognition in the international arena as a pioneering effort for bringing the issue to the forefront of the international water agenda.

The 2019 edition of the UNESCO WWAP Toolkit on Sex-disaggregated Water Data shows direct relevance to the achievement of SDG 5 on gender equality and women and girls’ empowerment, and of SDG 6 on ensuring the availability and sustainable management of water and sanitation for all. Both SDGs have profound linkages with other SDGs and directly address SDG 17 with particular reference to Target 17.18 on disaggregated data.

Tool 2 describes the methodological foundation for the collection of sex-disaggregated water data. Together with the updated list of conceptual indicators formulated in Tool 1 (Indicators), it provides the conceptual framework for the application of Tools 3 (Guidelines) and 4 (Questionnaire) in the field. This second tool sets out the theoretical background for the collection of sex-disaggregated water data in the field.

Sex-disaggregated water data can inform policies and contribute to achieving gender equality and women’s empowerment through transformative actions. This Toolkit is a useful instrument that aims to set global standards for the collection of sex-disaggregated data related to water. It may be considered a means to gradually close the gender data gap and to speed up the achievement of the gender-related goals and targets of the 2030 Agenda for Sustainable Development.

With this publication, WWAP contributes to the strengthening of gender equality and women empowerment in water resources management and governance and to the reinforcement of social inclusion, sustainable development and water security for a more peaceful future.
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ANNEX

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## LIST OF ACRONYMS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>GDP</td>
<td>Gross domestic product</td>
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<td>GGRETA</td>
<td>Groundwater Resources Governance in Transboundary Aquifers</td>
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<tr>
<td>GII</td>
<td>Gender Inequality Index</td>
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<tr>
<td>IHDI</td>
<td>Inequality-adjusted Human Development Index</td>
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<tr>
<td>IRC</td>
<td>International Reference Centre on Community Water Supply</td>
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<tr>
<td>MPA</td>
<td>Methodology for participatory assessment</td>
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<tr>
<td>SDC</td>
<td>Swiss Agency for development and Cooperation</td>
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<tr>
<td>SDG</td>
<td>Sustainable Development Goal</td>
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<tr>
<td>TWM</td>
<td>Transboundary water management</td>
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<tr>
<td>UN DESA</td>
<td>United Nations Department of Economic and Social Affairs</td>
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<tr>
<td>WEF</td>
<td>World Economic Forum</td>
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<tr>
<td>WID</td>
<td>Women in development</td>
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<tr>
<td>WSP</td>
<td>Water and Sanitation Programme</td>
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<td>WWAP</td>
<td>World Water Assessment Programme</td>
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Guidelines on how to collect sex-disaggregated water data

Joni Seager
United Nations World Water Assessment Programme

These statistics are crucial for understanding the impact of water on gender and for making informed decisions. WWAP's project will help countries change these statistics.

A 2013 survey by the UN Statistical Commission revealed that gendered water data was among the least available of national-level indicators: 45.2 per cent of countries do not produce any gender statistics related to water. WWAP's project will help countries change these statistics.

The comprehensive list of priority gender-sensitive indicators described in this technical paper fall under five broad topics: i) water governance, ii) safe drinking water, iii) decision-making and policy-making, iv) transboundary water resources management, and v) water for income generation for industry and agriculture. More resources are needed to address these challenges.

The project will prove the value of creating baseline knowledge related to water, from which the project's monitoring of post-2015 development goals, build capacity for collection of sex-disaggregated water data, provide strong support for the sex-disaggregated data, provide strong support for the gender progress can later be evaluated.

The project. The Guideline and the Questionnaire are in the field which, together with a guideline on how to collect gender-sensitive indicators and related methodology, WWAP provides in this technical paper a priority set of gender progress can later be evaluated.

create baseline knowledge related to water, from which capacity for collection of sex-disaggregated water data

Sex-disaggregated indicators for water assessment, monitoring and reporting

Guidelines on how to collect sex-disaggregated water data

Questionnaire for collecting sex-disaggregated water data

2015 WWAP TOOLKIT ON SEX-DISAGGREGATED WATER DATA
The scarcity of sex-disaggregated data is a major obstacle to the production of scientific evidence on gender inequality. The UNESCO WWAP Toolkit on Sex-disaggregated Water Data aims to provide a methodology and concrete instruments to close the information gap on water and gender, inform water policies and help implement gender-transformative actions.

The new edition of the Water and Gender Toolkit forms part of WWAP’s initiative on gender-responsive water assessment, monitoring and reporting, and belongs to the Water and Gender Series. The 2019 Toolkit has been produced in light of the success of the 2015 edition, which received official recognitions on multiple occasions, and was endorsed by the 23rd Inter-Governmental Council of the UNESCO International Hydrological Programme (IHP) (Resolution XXIII-2) to be used and disseminated in Member States.

The 2019 edition is inspired by the 2030 Agenda for Sustainable Development. It addresses the interconnections between the Sustainable Development Goals and incorporates the lessons learnt from the tests undertaken in the field using the 2015 Toolkit.

Tool 1, Gender-responsive indicators for water assessment, monitoring and reporting contains new ‘conceptual’ indicators on crucial topics related to water, including human rights-based approach, education, climate change, migration and displacement, and indigenous knowledge.

Tool 2, Methodology for the collection of sex-disaggregated water data, describes the methodology and its conceptual pillars for the collection of sex-disaggregated water data.

Tool 3, Guidelines on the collection of sex-disaggregated water data, reports on data collection methods. It covers the needs of different users and is applicable in different contexts and regions of the world.

Tool 4, Questionnaire for the collection of sex-disaggregated water data, contains a comprehensive list of over 400 questions to collect the information related to the conceptual indicators of the ten priority topics defined in Tool 1.

With this Toolkit, WWAP contributes to the strengthening of gender equality and women empowerment in the water sector for a more sustainable, water secure, inclusive and peaceful future.