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**Measuring the nexus between gender equality and women’s empowerment and the environment, including climate change and disaster risk reduction**

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\*The views expressed in this paper are those of the authors and do not necessarily represent those of the United Nations.

# Measuring the nexus between gender equality and women's empowerment and the environment, including climate change and disaster risk reduction

## 1. Abstract

There is a growing body of literature on the connections between gender equality and women's empowerment, on the one hand, and environmental conservation, management and degradation, on the other. Available information shows that women and men are experiencing the effects of climate change differently, contribute to environmental degradation and conservation in unique ways, and face different levels of preparedness and capacity to cope with disasters. However, there are still significant data gaps in the area of gender and environment statistics. Notably, (a) data for population-based indicators on gender and the environment (in national, regional and global frameworks) is not consistently disaggregated; (b) additional indicators are necessary to adequately capture the gendered drivers of environmental degradation, the differentiated impacts of climate change and disasters on women and men, existing gendered differences in vulnerability and capacity to cope, as well as women's specific contributions to environmental preservation, climate change mitigation and adaptation; and (c) evidence to measure progress made by different countries in promoting gender equality and women's empowerment across environmental policy is currently limited. This paper examines the reasons behind these data gaps and enumerates some of the key challenges to produce and use related data. It also proposes a way forward to fill the gaps, which includes solutions ranging from the development of indicators that capture the gender-environment nexus more adequately, to the generation of estimates using existing data, leveraging geographic information systems and big data, and collecting new data.

## 2. Measuring the gender-environment nexus

The lives of women and men are intrinsically related to the environment. Globally, an estimated 27 per cent of the employed population work in agriculture<sup>1</sup>. Furthermore, from subsistence farming, to fishing, aquaculture, mining and forestry, a substantial share of the world's population utilizes environmental resources for survival, including as their main source of income. However, when these activities are carried out for self-consumption, wage work, third jobs, unpaid work or leisure, they are rarely captured by in official statistics.

Women also experience the effects of climate change differently than men, contribute to environmental degradation and conservation in unique ways, and face different levels of preparedness and capacity to cope with disasters. Official statistics also fail to capture these issues in most countries. Women, who are less likely than men to own assets and may stay out of the labour market to fulfil unpaid domestic and care responsibilities, depend on natural resources disproportionately for their livelihoods. Scant available data show that they undertake the bulk of the fish processing work<sup>2</sup>, are more likely to rely on forests for

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<sup>1</sup> See: <https://data.worldbank.org/indicator/SL.AGR.EMPL.ZS>

<sup>2</sup> See: <https://data.unwomen.org/publications/asean-gender-outlook>

firewood and fodder collection<sup>3</sup> and are responsible for water collection in 8 out of 10 households where improved sources aren't available on premises<sup>4</sup>. Women also play a key role in waste management, although their work is often underpaid and unrecognized<sup>5</sup>, partially due to the lack of data on this type of informal work. Women from the poorest communities, who are most reliant on natural resources for their livelihoods and/or who have the least capacity to respond, are bearing the brunt of climate-related natural hazards, such as droughts, landslides, floods and hurricanes.

An empirical study conducted by UN Women<sup>6</sup> demonstrated that climate change related factors such as drought episodes, increases in temperatures, aridity and flooding, among others, all had detrimental effects on gender outcomes such as child marriage, adolescent births and violence against women and, across countries, affected the availability of basic water sources and clean cooking fuels, which in turn had a disproportionate impact on women's time burden and wellbeing. Changing weather patterns are not only affecting agricultural planning and yields and the availability of natural resources, but also increasing the frequency of natural disasters and health crises. For women, who often lack ownership of land, productive and financial assets<sup>7</sup> and social protection<sup>8</sup>, coping with these events is especially challenging.

Economic and social disparities, including inequalities in education, living conditions, geography and 'location' and a greater likelihood to be employed in insecure and low-paying jobs, make some groups of women more vulnerable than others to disasters and the effects of climate change. In Colombia, for example, an analysis of the 2015 Demographic and Health Survey showed that women and girls from the richest urban households fared far better than women and girls from the poorest rural households in key SDG related outcomes. Among the rural poorest, indigenous women and girls lag far behind the non-ethnically affiliated majority on key issues such as accessing improved drinking water, clean fuel and housing.<sup>9</sup> Similarly, data analysis in Bangladesh, Cambodia, Nepal, Philippines and Timor-Leste<sup>10</sup> demonstrated that wealth is has the highest predictive power for access to fuels, but in the same countries other climate related factors such as distance to the nearest lake and average day land surface temperature play an equal or even greater role when it comes to predicting access to water. It is thus important to consider the specificities of different population groups when analyzing gender-environment

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<sup>3</sup> See: <https://www.unredd.net/documents/global-programme-191/gender-and-womens-empowerment-in-redd-1044/global-gender-resources/15951-un-redd-methodological-brief-on-gender.html>

<sup>4</sup> See: <https://data.unicef.org/resources/safely-managed-drinking-water/>

<sup>5</sup> See: [https://www.unep.org/resources/report/gender-and-waste-nexus-experiences-bhutan-mongolia-and-nepal?\\_ga=2.226367891.809061528.1633160078-152724407.1633160078](https://www.unep.org/resources/report/gender-and-waste-nexus-experiences-bhutan-mongolia-and-nepal?_ga=2.226367891.809061528.1633160078-152724407.1633160078)

<sup>6</sup> (Forthcoming) UN Women, 2021. Duerto-Valero, Kaul, Chang et al. The impact of climate change on gender-inequality outcomes: Empirical evidence from South and South-East Asia.

<sup>7</sup> See: [https://www.oecd-ilibrary.org/development/sigi-2019-global-report\\_bc56d212-en?itemId=/content/component/6498ea10-en&csp=1f09e233a266df297e63e467be381349&itemILO=oe.cd&itemContentType=chapter](https://www.oecd-ilibrary.org/development/sigi-2019-global-report_bc56d212-en?itemId=/content/component/6498ea10-en&csp=1f09e233a266df297e63e467be381349&itemILO=oe.cd&itemContentType=chapter)

<sup>8</sup> See: ILO (2021) [World Social Protection Report 2020-22: Social protection at the crossroads – in pursuit of a better future](#). ILO, Geneva.

<sup>9</sup> <https://www.unwomen.org/-/media/headquarters/attachments/sections/library/publications/2018/sdg-report-gender-equality-in-the-2030-agenda-for-sustainable-development-2018-en.pdf?la=en&vs=4332>

<sup>10</sup> (Forthcoming) UN Women, 2021. Duerto-Valero, Kaul, Chang et al. The impact of climate change on gender-inequality outcomes: Empirical evidence from South and South-East Asia.

data. Aggregates conceal inequality in outcomes and obscure the reality of the most vulnerable in society. Women and girls in all their diversity must be counted and visible.

When disasters occur, the lack of a gender angle across related statistics, which overwhelmingly focus on numbers of deaths, injuries, displacement and property loss at the household level, may contribute to obscure women's needs as well. Responses to hydro-meteorological disasters and other crises, including the COVID-19 pandemic, are thus often gender blind. Heavily focused on humanitarian assistance for the injured and displaced population, little attention is usually paid to women's needs. For instance, food is typically distributed with household quotas, without taking into consideration intrahousehold inequalities in food consumption. Stimulus packages, including tax policy, labor market and social protection measures, may be provided to businesses, formal workers or households but are often gender-blind and may miss occupational groups in which women are overrepresented. In situations of post-disaster displacement, access to maternal health services, contraceptives and hygiene products may not always be provided or prioritized. In addition, women own fewer assets and are more likely to find barriers to inheritance in the event their family members die, so they are more heavily dependent on some of these policies for survival.

The lack of data on many of these issues renders women and their needs invisible to policy makers<sup>11</sup>. It also limits women's chances of participating in recovery mechanisms such as national protection clusters and committees on post-disaster recovery. Their absence from decision-making bodies may also limit the gender focus of medium-term policies and strategies, such as those related to climate change mitigation, natural resource conservation and 'just' transitions to sustainable production and consumption patterns. Filling data gaps on the gender-environment nexus, including on climate change and disaster risk reduction, is a key step in informing policies and programmes to achieve gender equality and empower women and girls.

### 2.1. Current monitoring practices and gender data gaps

Various internationally agreed monitoring frameworks and intergovernmental efforts are currently in place to track progress towards sustainable development outcomes, climate change, disaster risk and other environment-related measures. The most well-known multi-dimensional framework is the Sustainable Development Goals (SDGs) indicator framework. While the SDGs indicator framework

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<sup>11</sup> Analysis of government responses to the pandemic has underlined the extent to which women's rights and needs can be sidelined during crisis response and recovery, showing that only 20 per cent of the over 2,000 fiscal, labor market and social protection measures adopted across 219 countries and territories in response to COVID-19 between March 2020 and March 2021 were gender-sensitive (see UNDP and UN Women. 2021. COVID-19 Global Gender Response Tracker. Factsheet. March 2021 version.) This lack of gender-sensitivity is likely to be mirrored in the response to environmental crises too, but similar global data repositories on policy responses to hydro-meteorological disasters, climate change and environmental degradation are not currently available.

includes multiple environment-related indicators, not many are gender-specific.<sup>12</sup> Similarly, the Minimum Set of Gender Indicators (MSGI), agreed by the UN Statistical Commission in 2013, is another multi-dimensional set comprising 52 quantitative and 11 qualitative indicators,<sup>13</sup> among which only one refers to the gender environment nexus specifically<sup>14</sup>. Recent attempts to include more indicators related to the environment have not succeeded. Similar priority gender indicator sets exist across region, including a minimum set of gender indicators was developed for Africa<sup>15</sup>, for Asia and the Pacific<sup>16</sup> and for Europe<sup>17</sup>. These regional sets include indicators on gender and the environment to a limited degree.

Other internationally agreed sets and frameworks specifically focus on environment statistics, but lack robust references to gender issues. The system of environmental-economic accounting (SEEA), is one of the most used platforms for national reporting on environment-related progress. As defined by the United Nations, the SEEA is “a framework that integrates economic and environmental data to provide a comprehensive view of the interrelationships between the economy and the environment and the stocks and changes in stocks of environmental assets, as they bring benefits to humanity”<sup>18</sup>. As noted in the definition, the focus of environment statistics, as reported through the SEEA, lies heavily on measuring natural resources and economic assets, with little reference made to human activity and their impact on the environment, or vice-versa. Recent developments within the system are starting to explore these connections although much remains to be done. For instance, Ecosystem Accounting, which explores the contribution of ecosystems and their services to the economy, social wellbeing, jobs and livelihoods, is an important framework for linking data about habitats and landscapes to information on human activity. Furthering this work, including by keeping accounts of the differentiated contributions of ecosystems to women’s and men’s livelihoods, for instance, could prove effective for mainstreaming gender in environment statistics consistently.

On the specific area of disaster statistics, the **Sendai framework** is most often used for progress reporting. The framework, meant to be in place as a monitoring tool until 2030, focuses on the following areas: (i) Understanding disaster risk; (ii) Strengthening disaster risk governance to manage disaster risk; (iii) Investing in disaster reduction for resilience and; (iv) Enhancing disaster preparedness for effective

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<sup>12</sup> An example is SDG indicator 13.3.1 (*Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment*) is the only gender-specific environment indicator. See UN Women. 2021. Progress on the Sustainable Development Goals: The gender snapshot 2021.

<https://www.unwomen.org/-/media/headquarters/attachments/sections/library/publications/2021/progress-on-the-sustainable-development-goals-the-gender-snapshot-2021-en.pdf?la=en&vs=1057>

<sup>13</sup> <https://genderstats.un.org/#!/home>

<sup>14</sup> SDG indicator 5.a.1 [(a) Percentage of people with ownership or secure rights over agricultural land (out of total agricultural population), by sex; and (b) share of women among owners or rights-bearers of agricultural land, by type of tenure].

<sup>15</sup> African Development Bank, UN Economic Commission for Africa, UN Women. 2020. Minimum Set of Gender Indicators for Africa. <https://data.unwomen.org/publications/minimum-set-gender-indicators-africa-phase-iii-report>

<sup>16</sup> See: [https://undocs.org/pdf?symbol=en/E/ESCAP/CST\(4\)/10](https://undocs.org/pdf?symbol=en/E/ESCAP/CST(4)/10)

<sup>17</sup> See: [https://unece.org/DAM/stats/publications/2015/ECE\\_CES\\_37\\_WEB.pdf](https://unece.org/DAM/stats/publications/2015/ECE_CES_37_WEB.pdf)

<sup>18</sup> See: <https://seea.un.org/>

response, and to "Build Back Better" in recovery, rehabilitation and reconstruction<sup>19</sup>. National governments, typically through National Disaster Management Organizations or National Statistics Offices, report data to the international statistical system utilizing the Sendai Monitor<sup>20</sup>. As internationally agreed, countries are encouraged to disaggregate the data by sex, age and disability status, but in reality very few countries report disaggregated estimates. In some cases, this stems from heavy reporting burden, as opposed to an actual lack of individual-level microdata in countries. Thus, promoting the disaggregation of all Sendai indicators under targets A (on mortality and missing persons) and B (on injured population, damaged dwellings and livelihoods), as well as on select indicators under G<sup>21</sup> (on early warning), could be an important entry point to promote better gender mainstreaming on disaster statistics. Ideally, disaggregation must go beyond sex and include the intersection of sex and other relevant characteristics, including disability status, race/ethnicity, income, location and other attributes, where sampling allows.

An important caveat with disaggregated Sendai indicator data currently stems from data collection methods and survey operations typically used in the context of disasters. Data for Sendai Framework indicators typically come from multiple sources, including national disaster loss accounting systems, national statistical systems, household surveys and routine administrative sources. Failure to integrate gender equality considerations in any of these sources from the outset, particularly in administrative data systems or macro-level national disaster loss accounting systems, means that little to no gender data can be generated. Post-disaster needs assessment surveys, when they exist, typically follow household-level sampling and rely on a single informant. This results on the use of proxy respondent as a default data collection method (e.g. household head, typically men, responds for all household members), which has been widely documented to produce inaccurate statistics for other household members, such as women. Furthermore, much of the information available in disaster loss databases pertains to households or even location-based estimates (e.g. damaged property, destroyed public buildings, etc). In these cases, women's underrepresentation is even more severe.

Furthermore, data disaggregation alone won't be adequate for capturing the vast array of gender issues associated with disasters. To better assess women's vulnerability, coping capacity and resilience to disasters, the methodology for some of the Sendai framework indicators would have to be adjusted, and new indicators would have to be added for a more comprehensive approach. For instance, indicators pertaining to damaged property or economic loss due to damaged productive assets, focus mostly on assets owned. As women are less likely than men to own assets, their loss of livelihoods is not adequately captured through these indicators. Adding indicators to the framework on areas such as loss of employment, reduced paid work hours, or increased unpaid work burdens (including domestic work, care work and unpaid production of goods, such as water and firewood collection) would be essential to capture the differentiated impacts on women. The Sendai framework also measures the destruction of

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<sup>19</sup> See: <https://www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030>

<sup>20</sup> See: <https://sendaimonitor.undrr.org/>

<sup>21</sup> Notably G-3 (Number of people per 100,000 that are covered by early warning information through local governments or through national dissemination mechanisms) and G-6 (Percentage of population exposed to or at risk from disasters protected through pre-emptive evacuation following early warning).

infrastructure as a result of disasters. In this regard, it would be important to add indicators pertaining to gender-specific infrastructure, such as emergency obstetric care facilities, and to public transit, since women often rely on it disproportionately, to better capture the impact on women. Finally, regarding Sendai indicators for targets E (on national policies) and F (on financing), additional gender specificities must be added. For instance, on top of measuring the proportion of countries that adopt national DRR strategies in line with the Sendai Framework, it would be important to also assess whether these include adequate gender equality considerations. Doing so would require further methodological development, including a strategy for qualitative coding on a range of gender dimensions that DRR strategies can be expected to address.<sup>22</sup> Similarly, tracking of ODA to DRR should ideally be done utilizing gender markers, to ensure an increasing amount of funds is allocated to promoting gender equality.

In the area of climate change, no internationally agreed framework currently exists. In March 2021, the United Nations Statistics Division (UNSD) furthered efforts to create one by launching a global consultation. As mandated by the Statistical Commission at its 47th session in 2016, the **Global Set of Climate Change Statistics** was first developed by UNSD and the United Nations Framework Convention on Climate Change (UNFCCC), and other international agencies as well as UN Member States were invited to send comments<sup>23</sup>. The process followed to create the set was to carry out a review of climate change indicators currently in use by countries and identify a draft set of “the most commonly repeated indicators”. The selected indicators were then organized into the five areas of the IPCC framework: drivers, impacts, vulnerability, mitigation and adaptation. A key limitation of this approach is related to the fact that most of the indicators currently in use and with available data, are those for which data collection is relatively easier, but not necessarily those that measure the most relevant climate-change related issues from a policy perspective. Only a few of the indicators in the set included sex disaggregation, and in many cases, as the data was collected at the household level, individual level disaggregation was not possible (as noted earlier, disaggregation by sex of head of household is discouraged given that proxy respondent information is largely inaccurate). In other instances, disaggregation by other variables would be of additional relevance. For instance, on an indicator such as “use of nitrogen fertilizers per hectare of agricultural area”, disaggregating by sex of the agricultural landowner (as opposed to simply disaggregate by sex of the respondent or user of the agricultural land) could provide insights on whether men or women owners are more likely to have products that contribute to environmental degradation applied on their land. When performing this type of disaggregation, it is important to note that how landowner data is collected can lead to important gender biases. For instance, agricultural censuses and surveys often collect data at the holding level, and hence do not capture management within the holding, which may consist of several plots of land managed by different household members, including women.<sup>24</sup>

Worryingly, many of the issues of relevance to measure climate change from a gender perspective are absent from the set. For instance, in the Drivers section, no indicators make reference to men’s

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<sup>22</sup> Research and data generation on gender mainstreaming in other strategic planning instruments can provide guidance in this regard. See, for example, joint research by UN Women and UNICEF Innocenti on national social protection strategies: Camiletti et al. 2021, [Mainstreaming gender into social protection strategies and programmes: Evidence from 74 low- and middle-income countries](#). UN Women and Unicef Innocenti, Florence).

<sup>23</sup> See: [https://unstats.un.org/unsd/envstats/ClimateChange\\_StatAndInd\\_global.cshtml](https://unstats.un.org/unsd/envstats/ClimateChange_StatAndInd_global.cshtml)

<sup>24</sup> <https://www.fao.org/gender-landrights-database/data-map/statistics/en/>

overrepresentation in highly polluting industries, or to women's lack of decision-making power in forest management committees or water and fish stock management. In the Impacts section, there are indicators that address crop loss due to climate shocks, for instance, but no indicator looks at increases in child marriage or adolescent births due to these shocks. Vulnerability indicators should include asset ownership indicators in line with EDGE recommendations, as well as indicators on land ownership and secure tenure, by sex, for instance, which are of high relevance to women. The mitigation indicators in the framework focus on policies, strategies and technologies, but do so at the macro level and fail to reflect whether men and women are benefiting from these policies equally. Similarly, the different roles played by men and women on climate change mitigation, for instance by adopting climate-smart agricultural practices, are not reflected in any of the current indicators. Finally, adaptation indicators range from covering early warning systems, to counting reports on climate change statistics or measuring total surfaces with biodiversity protection. Although extremely important, these measures, again, fail to capture gender differentiated outcomes, such as women's lesser access to technology and related early-warning systems, or their role in biodiversity management, including through the use of traditional knowledge. Including additional indicators to this set would, therefore, be of outmost importance.

Better gender data on drivers, impacts and vulnerability are critical to inform mitigation and adaptation strategies, policies and programmes which, to date, pay insufficient attention to gender dynamics. In the social protection space, for example, the debate about how to best gear social protection systems to address vulnerabilities resulting from climate change has been ongoing, but proposals for shock-responsive social protection are not routinely informed by gendered risk and vulnerability assessments informed by adequate sex-disaggregated data and gender statistics.<sup>25</sup> Similarly, policy efforts geared towards achieving more sustainable production and consumption patterns by shifting jobs away from fossil fuels to less polluting sectors should be (a) informed by gender analysis, including sex-disaggregated data on employment by industry (to ensure women have fair access to jobs that contribute to gender-just transitions) and (b) monitored through indicators that track action from a gender perspective.<sup>26</sup>

Another global indicator set of relevance for gender and the environment is the **Post-2020 Global Biodiversity Framework**. The framework has four long-term goals for 2050, each with corresponding milestones and indicators. The goals generally tackle the following areas: (i) Enhanced integrity of all ecosystems; (ii) Conservation and sustainable use of natural resources; (iii) Equitable sharing of benefits from genetic resources; and (iv) Finance and means of implementation<sup>27</sup>. The framework includes indicators on important gender issues such as women's participation in decision-making bodies, including environment related, as well as women's access to land ownership and secure tenure. However, little is included in terms of human contribution to biodiversity loss, and the differentiated roles men and women play in this regard. An indicator is included on wildlife trafficking, but it lacks disaggregation by sex of perpetrator. An indicator on use of pesticides is also included, but it focuses on amount of pesticide per

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<sup>25</sup> Costella et al. 2021. "[Social protection and climate change: scaling up ambition.](#)" Social Protection Approaches to COVID-19 Expert Advice Service (SPACE), DAI Global UK Ltd.

<sup>26</sup> UN Women. 2021. [Beyond COVID-19: A Feminist Plan for Sustainability and Social Justice](#). UN Women, New York.

<sup>27</sup> The goal names included here are a shorthand. To view the full goal names, refer to: <https://sdg.iisd.org/news/first-draft-of-global-biodiversity-framework-identifies-four-goals-for-2050/>



hectare, and thus fails to measure the connections between this practice and the sex of the landowner, his or her educational attainment, and other background characteristics. Further, no sex or multi-level disaggregated employment-related indicators or indicators on other practices contributing to biodiversity loss (such as production and use of plastic and other petrochemicals or use of trawling and cyanide for fishing) and conservation (such as fish stock management, reporting of by-catch, and sustainable forest management) are included. Gathering this information could support the development of targeted policies for these population groups, for instance, by building their capacity to exercise sustainable practices or by empowering indigenous women to lead environmental conservation efforts. As this framework is still in its final stages of development, advocacy efforts to promote the inclusion of some of these gender-related issues would be an effective entry point for gender mainstreaming.

Other indicator sets exist in different areas of environment statistics. For instance, many international organizations and conventions, including the Organization for Economic Cooperation and Development, the European Environment Agency and the United Nations Convention to Combat Desertification, all manage environment related monitoring frameworks and indicator sets, with different degrees of inclusion of gender-related issues. As their use is more limited to specific regions or thematic areas of work, these have not been included in this discussion paper.

## 2.2. Possible solutions to mainstream gender across environment statistics

To tackle some of the issues highlighted above and mainstream gender across environment statistics in a comprehensive manner, a multidimensional approach is needed. The following solutions could be considered as first steps towards enhancing the availability and gender sensitivity of environment statistics:

1. **Where relevant, indicator data must be sex-disaggregated, but this may require changes in data collection methods.** As highlighted above, only some indicators in environment monitoring frameworks refer to population measures. For population-based indicators, it would be important to apply sex-disaggregation consistently to identify differentiated outcomes between men and women. In many instances, sex-disaggregating indicator data can be as simple as reprocessing existing data. For instance, information on disaster deaths and injuries is often collected for men and women, but often only reported in the Sendai Monitor as an aggregate. Disaggregating these data by sex should be relatively easy, but commitment is necessary from national disaster management agencies or other national bodies responsible for reporting. Efforts are also needed to consistently disaggregate data not only by sex but also by other relevant characteristics. At present, reporting burden often results on sex disaggregation only being carried out for the smaller disasters (less destructive and less deadly), and thus national sex-disaggregated estimates can't always be calculated. It is thus important that national governments commit to disaggregate these data more consistently. An additional barrier to sex disaggregation has to do with survey design, as many surveys are implemented at the household level, relying on proxy respondents (e.g. only household heads are interviewed). This is well known to provide biased responses for other household members, so changes in survey design need to be implemented in many cases. Examples of current surveys that interview all household members on areas other than environment include Demographic and Health Surveys, Multiple Indicator Cluster Surveys, Labor Force Surveys and surveys under the Living Standard Measurement Study Plus (LSMS+)

programme. Including modules on environment in some of these surveys or applying similar types of individual level sampling for environment-related surveys would be essential to enhance the availability and quality of sex-disaggregated indicator data.

2. **Data on needs and vulnerabilities of marginalized groups of women and girls must be prioritized.** In addition to data disaggregated by sex, simultaneous disaggregation by multiple dimensions, including by income, sex, age, race, ethnicity, migration status, disability, geographic location and other characteristics relevant to national contexts are also required to identify those most impacted by climate change, disasters and biodiversity loss. In many countries, however little or no information is collected on persons with disabilities, on racial, ethnic and religious minorities or on gender identity. Even when these subgroups are included in surveys, the sampling may not be stratified and thus not suitable for generating estimates disaggregated at multiple levels. Fulfilling the principle of leaving no one behind will require consistently producing estimates on these and other vulnerable groups that have traditionally been invisible in official statistics and ensuring their concerns and needs are reflected in evidence, discourse and policy response to climate change.
3. **Additional indicators to capture gender-relevant issues must be added to existing international frameworks.** Direct mortality, disappearance and displacement impacts of disasters and climate change-related weather events are overall well reflected in existing frameworks. However, further work is needed to enhance measurements that adequately capture the differentiated economic impact of climate change, disasters and biodiversity loss on women and men. To support countries in the selection and calculation of indicators that measure the gender-environment nexus, UN Women's Regional Office for Asia and the Pacific, in partnership with IUCN, UNEP and UNESCAP, conducted inter-governmental consultations and put together a preliminary set of gender-environment indicators to monitor these issues across the region<sup>28</sup>. After further regional and global consultations, the set was substantially expanded and edited. In November 2021, UN Women will release a compendium of 100 indicators on gender and the environment, along with related methodological guidelines for their calculation<sup>29</sup>. This menu of indicators covers issues of disaster exposure, preparedness and impacts, climate-change related impacts, engagement in green jobs, sustainable agriculture and land use, participation and practices on other environment-related livelihoods, asset ownership, environmental decision making and mobility. Country and regional efforts should be directed at localizing this framework and building the capacity of relevant government institutions, including national statistics offices and national disaster management agencies, to ensure data is collected, analyzed and used to advance environmental policies that are gender-responsive.

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<sup>28</sup> See: <https://data.unwomen.org/publications/mainstreaming-gender-environment-statistics-sdgs-and-beyond-identifying-priorities>

<sup>29</sup> UN Women 2021, Measuring the Gender - Environment Nexus (forthcoming).



### Box 1: Identifying additional indicators on gender and the environment

The identification of adequate indicators that support monitoring of the gender-environment nexus will require an assessment of current gaps in the monitoring framework where these indicators will be added. Across the frameworks discussed in this paper, some key gap areas that need to be addressed include the following:

- In the Sendai and Climate Change frameworks, shifting focus from measuring economic loss due to damaged productive assets towards measuring changes in employment status, wages, hours worked and access to infrastructure, could provide useful insights on women's resilience to disasters and the effects of climate change. An example indicator in this regard could be *Proportion of population who changed or lost their job as a result of climate change, by sex and type of employment (formal/informal)*
- Measurements associated with changes in time spent on unpaid care work, unpaid domestic work (including animal care) and unpaid production of goods (e.g. fetching water, collecting fuels, harvesting fodder) must be added to Sendai, Climate Change and Biodiversity frameworks as they are essential to better reflect women's contribution to the economy and how climate change may be increasing their burdens. As such, these indicators may also be useful for environmental accounts, as ecosystems may affect unpaid work time. An example indicator in this regard could include *Proportion of population exposed to disasters whose time spent on unpaid care work increased as a result, by sex and type of care (adult/child)*

- Indicators on resilience would also be critical to assess women and men’s capacity to cope with disasters and the effects of climate change, and thus these should be added to the Sendai and Climate Change frameworks. Particularly, indicators that measure access to productive and financial assets could provide very relevant information. Other factors contributing to resilience, such as access to education, technology and social protection, should also be measured through indicators in these frameworks. An example indicator in this regard could include SDG indicator 5.a.1, *Proportion of total agricultural population with ownership or secure rights over agricultural land, by sex*
- Adding indicators to measure women’s access to natural resources would be important for environmental accounts, climate change and biodiversity frameworks. Similarly, climate change and biodiversity frameworks would also benefit from indicators on women’s contributions to natural resource management and conservation. Although some monitoring frameworks include indicators on women’s participation in Ministries of Environment or other decision-making positions, the role they play at the grassroots level, including in forest committees, fishery management councils and as waste management workers, remains largely unmeasured. An example indicator in this regard could include *Proportion of people who participate in forest groups, communal land governance groups or water management committees, by sex*.
- Finally, the addition of indicators that capture women and men’s contribution to natural resource degradation and biodiversity loss is also essential for curbing current trends. Indicators that capture their participation in heavily polluting industries vs. their engagement in green jobs could provide some information in this regard. Measuring their engagement and practices in various environment-related activities (regardless of whether or not these may be for pay or profit), such as agriculture, fisheries, aquaculture, forestry, mining, hunting or waste management, can also provide key insights on who makes environmentally detrimental decisions and how to change this behavior for conservation. An example indicator in this regard could include *Proportion of land users (excluding built-up are use) using fertilizers, pesticides or growth promoter, by sex*

Additional gap areas and indicators may be of relevance to different indicator frameworks. For proposing additions in line with framework gaps and existing targets, readers are encouraged to refer to UN Women’s list of 100 indicators to measure the gender-environment nexus (forthcoming, November 2021).

4. **National data collection strategies need to increasingly include gender-environment surveys or modules.** To fill existing gender-environment data gaps and report on environmental issues from a gender perspective in a more consistent manner, countries should include related surveys or modules in their data collection plans. Stand-alone gender-environment surveys, in particular, are best placed to collect data that is free from sampling bias. UN Women recommends that these surveys are conducted at the individual level, ideally by interviewing two adults of different sex per household. For specific environmental activities, such as engagement in fisheries, waste management and other environmental livelihoods, oversampling of specific population groups may be recommended. To guide countries in the design and implementation of gender-environment surveys, UN Women, in consultation with FAO, IUCN, ILO, UNDRR, UNEP and

UNESCAP, has developed a model questionnaire on gender and the environment<sup>30</sup>. The questionnaire includes 10 modules, which speak to the thematic areas set out in the 100 -indicator set. Along with the model questionnaire, a set of methodological guidelines will be released to support countries with survey operations, sampling and the calculation of the 100 gender-environment indicators once the microdata is available. The questionnaire affords the flexibility of implementing it as a stand-alone survey, or as separate modules attached to other suitable data collection instruments. For instance, the module on green jobs may be attached to national Labor Force Surveys, while the modules on climate change and disasters may be suitable for demographic surveys. Countries such as Bangladesh and Mongolia have already conducted gender-environment surveys utilizing the questionnaire. Other countries are set to begin data collection in 2022.

5. **Geospatial information systems and other forms of big data can be leveraged to fill gender-environment data gaps.** Big data can be leveraged in a multitude of ways to gather additional insights on the gender-environment nexus. For instance, data from online transactions can provide insights on the sustainability of women and men’s consumption patterns; data from on-line searches (e.g. google, bing, etc.) can point to sex-differentiated trends regarding information needs in the context of early warning and disaster preparedness; phone records and location data can help monitor population movements in the context of environmental refugees or temporary displacement as a result of disasters; and social media posts can provide insights on on-line discourse pertaining to gendered attitudes towards environmental issues. Geospatial information is a particularly useful form of big data when it comes to measuring the gender-environment nexus. Information on numerous climate-related variables extracted from satellite imagery is freely available for most countries, and integrating it with survey data can provide unique insights on the connections between gender and the environment. For example, UN Women’s data analysis showcased that increases in aridity, temperatures, the frequency of drought episodes, risk of floods and proximity to water bodies all had a substantial effect on the likelihood of child marriage, adolescent births, access to basic drinking water and access to clean cooking fuels for women in all countries where data was analyzed<sup>31</sup>. In an area like gender-environment, where data are scantily available for monitoring trends and make comparisons across countries, this type of analysis is providing invaluable insights. Countries are thus encouraged to pursue further analysis of geospatial variables and other forms of big data, including by integrating it with different national surveys to assess the connections between gender and the environment.
6. **Satellite accounts can be added to the system of environmental-economic accounting.** The SEEA measures the relationship between the environment and the economy. As it is the gold standard for national reporting on these issues, integrating additional measures that link these accounts to the lives of women and men would be particularly transformational. Numerous entry points exist in the system, among which Ecosystem Accounting (SEEA EA) particularly stands out<sup>32</sup>. SEEA EA

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<sup>30</sup> UN Women 2021, Measuring the Gender - Environment Nexus (forthcoming).

<sup>31</sup> UN Women 2021, The impact of climate change on gender-inequality outcomes: Empirical evidence from South and South-East Asia (forthcoming).

<sup>32</sup> SEEA EA is a spatially-based, integrated statistical framework for organizing biophysical information about ecosystems, measuring ecosystem services, tracking changes in ecosystem extent and condition, valuing

was developed with a focus on making visible the contributions of nature to the economy and people<sup>33</sup>, and better recording the impacts of economic and other human activity on the environment<sup>34</sup>. For instance, SEEA EA considers users and beneficiaries of ecosystem services. That is, for an ecosystem service such as crop provisioning (supplied by cropland), SEEA EA considers factors determining supply (such as soil fertility or farm management practices); factors determining use (such as demand for biomass for food production); benefits of the service (e.g. harvested crops); and importantly it considers the main users and beneficiaries (such as agricultural producers, including household and subsistence producers). It is within this context that an extension of these accounts can be made to reflect gender differences in users and beneficiaries. Monetary valuation of these activities would provide remarkable insights on women and men's contribution to, and exploitation of, these environmental assets. As SEEA EA can be deployed in the application of scenario analysis to support policymaking<sup>35</sup>, this can be used to better understand the increasing interconnectedness between the natural environment, human societies and their economies from a gender angle, which implies new opportunities for policymakers. Furthermore, the SEEA EA's data on ecosystems, including satellite accounts on gender differences, if these existed, could be combined with the data from the SEEA Central Framework accounts on environmental pressures, individual resource stocks and environmental responses in the form of expenditures, taxes and subsidies, to provide a more comprehensive picture. As gender-environment data becomes increasingly available, including through data reprocessing and surveys, as set out in points 1 to 6 above, work on the development of gender equality satellite accounts for Ecosystem Accounting should be considered.

- 7. Countries should include gender-environment indicators in monitoring frameworks for national environmental policies.** Regardless of whether or not gender-environment indicators are part of the reporting requirements of international commitments and related monitoring frameworks, an increasing number of countries are working towards including them in national monitoring frameworks for climate change mitigation strategies, disaster management plans, national sustainable development plans and other environment-related policies<sup>36</sup>. Although this is unlikely to yield estimates that allow for comparisons across countries, it is an important step towards beginning data production, and key to monitoring the gender-environment nexus in countries, particularly the contributions of national policies towards sustainably enhancing the lives of women and men. In addition, producing and reporting these data within countries can also contribute to raising the visibility of this issue and identifying nationally relevant gender patterns. Beyond national statistical offices, it is important for sectoral agencies to incorporate a gender and environmental lens in their data collection, monitoring and evaluation efforts. Actors and

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ecosystem services and assets and linking this information to measures of economic and human activity. (See more at: [https://unstats.un.org/unsd/statcom/52nd-session/documents/BG-3f-SEEA-EA\\_Final\\_draft-E.pdf](https://unstats.un.org/unsd/statcom/52nd-session/documents/BG-3f-SEEA-EA_Final_draft-E.pdf) )

<sup>33</sup> These contributions extend well beyond those to marketed goods, such as timber and fish, and include services such as air filtration, water purification, global climate regulation and recreation-related services.

<sup>34</sup> See: [https://unstats.un.org/unsd/statcom/52nd-session/documents/BG-3f-SEEA-EA\\_Final\\_draft-E.pdf](https://unstats.un.org/unsd/statcom/52nd-session/documents/BG-3f-SEEA-EA_Final_draft-E.pdf)

<sup>35</sup> See: [https://unstats.un.org/unsd/statcom/52nd-session/documents/BG-3f-SEEA-EA\\_Final\\_draft-E.pdf](https://unstats.un.org/unsd/statcom/52nd-session/documents/BG-3f-SEEA-EA_Final_draft-E.pdf)

<sup>36</sup> This is the case, for instance, in Bangladesh, Cambodia and Vietnam, all of which have included or are working to include gender indicators in their national climate change and disaster risk reduction monitoring frameworks. See: <https://www.empowerforclimate.org/en/resources/i/n/t/integrating-gender-in-climate-change-and-disaster-related-statistics>

institutions in the humanitarian and social protection space, for example, should systematically include gender indicators in their emergency, risk and vulnerability frameworks and assessments. Similarly, Ministries of Finance should consistently consider gender indicators in ex-ante and ex-post assessments of investments in green transitions.

Beyond mainstreaming gender across environmental data production, it is important to promote the use of gender-environment data for policy making. However, little information is available to monitor and compare the efforts of national governments and other stakeholders to integrate gender across environmental strategies, policies and programmes, and whether these were duly informed by related data. In this regard, **a global tracker for assessing the availability of gender-responsive environmental policies could provide important insights**. Such a tool can support advocacy aimed at integrating gender into sectoral policies and strategies, by identifying gaps and good practices. UN Women, UNDP and the OECD are currently collaborating on a new module for the Global COVID-19 Tracker to identify the extent to which green recovery measures addressed gender equality and women's rights. Examples of such actions considered include targeted training for green innovation and green jobs, support to women entrepreneurs in green industries, and investments in time-saving sustainable infrastructure. This tool could later be expanded to other policies that target the gender-environmental nexus more broadly, including climate finance and gender-responsive mitigation and adaptation policies. Similarly, at a later stage, the information included in the tool could be used to explore whether these policies were informed by available data and identify key barriers for data use in policy making.

### **3. Conclusion**

Enhancing the availability and quality of data to measure the gender-environment nexus will be critical to improve evidence-based decision-making, and in turn the likelihood of environmental policy responding to women's needs. This paper has shown that, at present, there are important data gaps in this regard, as available environment data is rarely sex-disaggregated, indicators do not address key gender issues, and data collection instruments are not designed to adequately collate gender-related information and generate estimates disaggregated at multiple levels. The paper looks at the most widely used monitoring frameworks on environment-related statistics and proposes specific solutions to fill related gender data gaps. Ranging from disaggregating data by sex and other characteristics, to considering additional indicators on gender and the environment, leveraging geospatial information and collecting new data, among others, these solutions could make a significant contribution towards increasing the evidence base on the gender-environment nexus.

As the availability, quality and frequency of gender data increase, the pool of information available to policy makers grows – and so should evidence-based decision-making practices. Using gender data is expected to support an improvement in the fitness for purpose of environmental policy, and how it responds to women's needs. However, little evidence is available regarding the extent to which environmental policy currently integrates gender issues. Analysis of existing environmental policies and strategies from a gender angle, including whether or not these were informed by data, could provide important insights to identify barriers for evidence-based decision making. Some of these barriers may range from lack of statistical literacy on the part of policy makers, to lack of buy-in for the available



statistical estimates by decision-makers, and thus limited financing for the production of gender-environment data. Furthermore, as environmental policy and environment statistics are typically perceived as structural and highly technical, this may be deterring women's machineries and gender data experts from advocating for, and contributing to, the mainstreaming of gender across these fields.

Efforts towards expanding the quality and availability of gender data, must therefore be coupled with changing environmental policies and making them more gender responsive, which will require greater uptake and use of this data by gender equality advocates in different spaces. Making data on the gender-environment nexus available to gender experts working within development organizations and ministries is critical, and can help them bring a gender lens to policy making in areas that can be dominated by technical scientific knowledge at a very macro level.<sup>37</sup> Also important is strengthening the capacity of gender equality advocates in civil society to demand accountability and engage in these policy discussions, which may require efforts to demystify environmental policy as something that is "too technical". This is a process that has taken place in the realm of feminist economics with macroeconomic policy, where academics and technical specialists have engaged over years with international organizations, national policy makers and civil society organizations to influence change and democratize economic policymaking.<sup>38</sup> Through the Women Count programme<sup>39</sup> and by leveraging partnerships with international organizations and civil society, UN Women currently works towards enhancing dialogues between data users and producers and more broadly promote gender data use. An example of this work is the Gender and Environment Data Alliance, a multi-stakeholder alliance lead by IUCN and WEDO, to advance gender-just climate action at all levels through improved accessibility, understanding and use of gender-environment data. Only by supporting the entire cycle, from design of data collection to data production and data use, can transformative change occur.

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<sup>37</sup> Bernadette P. Resurrección, Rebecca Elmhirst (eds). 2020 *Negotiating Gender Expertise in Environment and Development: Voices from Feminist Political Ecology*. London: Routledge

<sup>38</sup> See for example, the UK Women's Budget Group, and Nawi: Afrifem Macroeconomics Collective.

<sup>39</sup> See: <https://data.unwomen.org/women-count>