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Gender, climate, and the environment

Assessing the relationship between gender and environment in an individual-level measure of multidimensional poverty: rationale, possibilities, and insights from Tonga[#]

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Abstract

The Equality Insights team at the International Women's Development Agency (IWDA) developed Equality Insights Rapid, a tool to enable individual-level, gender-sensitive measurement of multidimensional poverty via a phone survey, in the context of COVID-19. A variant of an existing longer face-to-face survey, Equality Insights Rapid assesses 15 dimensions of life including environment, plus assets to assess financial status. Demographic questions enable disaggregation of data by gender, age, disability status and location (urban/rural). Primary data collection enables analysis of correlations between the Environment dimension and other dimensions, including Water, Shelter, Sanitation and Time-use. This Working Paper outlines the relevance of Equality Insights to the landscape of data on gender and environment. It describes the rationale for including the environment as a dimension of multidimensional poverty and how it is assessed, briefly documenting the evolution in approach over time and presenting examples of resulting insights. The Working Paper introduces the Equality Insights Rapid survey implemented in Tonga in 2022, some four months after the eruption of the Hunga Tonga–Hunga Ha'apai volcano and associated tsunami. The approach to assessing environment as a dimension of multidimensional deprivation via a phone survey is outlined and initial results presented, illustrating the types of environmental insights that can be generated. Reflections are offered regarding the analysis that is possible given the scope of the data set and its contribution to the gender and environment data landscape.

[#] The Equality Insights Rapid Tonga Survey 2022 results shared in this paper are preliminary. The final results are expected to appear on the websites of Equality Insights and the Tonga Statistics Department in June 2023.

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I. Introduction: Measuring environment as a dimension of gender-sensitive multidimensional deprivation

1. Globally, poverty is primarily measured at the household level. This brings a range of known limitations, particularly for understanding the relationship between gender and poverty.¹
2. Equality Insights is an individual-level gender-sensitive measure of multidimensional poverty developed to provide an alternative to household-level measurement, with the objective that routine poverty measurement provides data that is gender-sensitive and can be disaggregated by gender, age, disability status and other demographic characteristics. Building from earlier work on the Individual Deprivation Measure (IDM), the measure and associated survey is grounded in feminist principles, rights and capabilities, and lived experience of poverty.² It has been reviewed³, audited⁴, tested through use in seven countries, and iteratively adapted.⁵
3. Equality Insights assesses achievement in fifteen dimensions of life—clothing, education, energy, environment, family planning, food, health, relationships, safety, sanitation, shelter, time use, voice, water, and work. The measure also assesses financial circumstances via assets; separate consideration enables assessment of the relationship between multidimensional achievement and financial status. The included dimensions were informed by the views of some 3000 people with lived experience of poverty in six countries regarding how poverty should be defined and measured and what needs to change to be not poor.⁶
4. The measure was designed to identify gender differences where they exist, and includes dimensions that are important for understanding gendered experiences of multidimensional poverty, and indicators that are gender-sensitive (for example, sufficient menstrual sanitary products). Both what is measured and how are important for gender-sensitivity. Primary data collection is undertaken using a purpose-built survey, which incorporates existing validated questions where possible. A brief household-level survey is completed by one knowledgeable person, to identify adults living in the household and assess dimensions shared by a household and most efficiently assessed at household level. Individual-level measurement allows for assessment of the implications of gender, age (with no upper cut off), disability (via the Washington Group Short Set questions), rural/urban location, other characteristics as relevant, and intersections of these, on the situation of particular groups. This helps to illuminate the implications of overlapping barriers faced by particular groups, and how patterns of deprivation vary.⁷ Sampling every adult in a household enables analysis of disparities inside households,⁸ where an estimated 30 percent of global inequality is found but systematically ignored by household-level measurement.⁹ Within-household analysis can also identify the “invisible poor”, the proportion of a population and its demographic make-up, who live in better off households, but are individually deprived.
5. Environment has been included as a dimension of individual-level gender-sensitive measurement of poverty from initial conceptualisation, informed by the participatory research, insights from gender and development theory and practice, and feminist perspectives on sustainable development. Feminist organising on environmental concerns has a substantial lineage. In the lead up to the United Nations Conference on Environment and Development in 1992, for example, the 1991 World Women’s Congress for a Healthy Planet brought together some 1500 women to speak about global environmental priorities

and “make the links between decisions reached in far-off boardrooms and military headquarters, and the worldwide subordination of both women and nature.”¹⁰

6. For feminists, understanding the nexus between gender and environment matters most fundamentally because gender inequality and unsustainable development are connected. Data is critical to making this visible, to inform gender-just action, and data gaps are significant. Improving the availability and accessibility of robust gender data about the environment will support informed, effective, gender-just and evidence-based environment and climate action that meets the needs of all people in all their diversity.
7. In a context of limited data at the nexus of gender and environment, various efforts are underway globally to strengthen data regarding gender and the environment, including collaborative feminist initiatives such as the Gender and Environment Data Alliance.¹¹ This Working Paper outlines the contribution of Equality Insights to this effort. It describes the rationale for including the environment as a dimension of multidimensional poverty and how it is assessed, briefly describing the evolution in approach over time and presenting examples of resulting insights. The paper introduces the Equality Insights Rapid phone survey which was implemented in Tonga in 2022, shortly after a significant natural disaster. The approach to assessing environment as a dimension of multidimensional deprivation via a phone survey is described and initial results presented, illustrating the types of insights that can be generated. Reflections are offered regarding the analysis that is possible given the scope of the data set and its contribution to gender and environment data landscape.

II. Including environment in a measure of multidimensional poverty

A. Rationale

8. The resources needed to reach a certain level of achievement vary from individual to individual, based on factors that are particular to the person, and their activities – for example, whether they are involved in manual subsistence farming, or breastfeeding. The natural environment in which a person lives also influences their needs for shelter, clothing and heating¹², and can provide a resource for meeting various needs, including food, energy and shelter. The extent to which individual needs can be met directly from the environment in turn influences the level of income required to meet relevant needs. Additionally, a person’s environmental context can be a source of disutility in itself. In this sense, living in a dangerous, degraded or polluted environment is a source of deprivation.
9. The environment can impact an individual’s safe access to, and utilisation of, various resources including schooling, and employment. Environmental shocks (such as natural hazards including cyclones and droughts) and general pollution (such as land, water, air, and soil pollution) can impact safety and health. People living in poverty are more likely to experience environmental harms, such as pollution or climate change,^{13,14} and environmental shocks can push people into poverty.^{15,16,17} Inclusive development can reduce the impact of harmful environmental factors on poverty,¹⁸ which is why it is critical to understand where environmental concerns are most pronounced as part of a holistic approach to addressing multidimensional poverty.
10. The relevance of the environment as an influence on individual deprivation will be shaped by a person’s economic and social roles and responsibilities and the implications of these for interaction with the environment. Gender is an important factor shaping economic and social

roles and responsibilities, and related engagement with the environment. Individual-level measurement of deprivation enables analysis of context and constraints by gender, age, disability and other relevant characteristics.

B. The Individual Deprivation Measure: initial approach to assessing the environment in multidimensional poverty measurement

11. As noted, Equality Insights takes forward earlier work known as the Individual Deprivation Measure (IDM). The IDM was a collaborative intellectual endeavour to commencing in 2008, to which many contributed.¹⁹ The development of the measure began with two-phases of participatory research in Angola, Fiji, Indonesia, Malawi, Mozambique and the Philippines. The environmental issues that were most frequently mentioned during the participatory work were problems associated with lack of waste disposal, and health issues associated with air, water, and soil pollution.²⁰
12. With a twin focus on comprehensiveness and parsimony, the Environment dimension was initially assessed via a single indicator, Environmental problems, and a single question:²¹ Are any of the following a significant problem for you, either at or near home or at other places where you spend a lot of time?
 - 1 = Large amounts of rubbish or a waste disposal site
 - 2 = Open sewage
 - 3 = Air pollution (air that smells bad or makes your eyes or throat sting)
 - 4 = Pools of water where mosquitoes or other disease carrying insects breed
 - 5 = Stores of unsecured agricultural or industrial chemicals and waste
 - 6 = Heavy vehicle traffic for much of the day
 - 7 = High levels of noise other than from vehicle traffic for much of the day
 - 8 = Any other significant environmental hazard
13. The IDM (and subsequently Equality Insights) assesses deprivation on a scale, providing information about the extent of deprivation below a minimally acceptable threshold and vulnerability to moving further into poverty. The further an individual is below this threshold, the greater their level of deprivation. In practical terms, scalar measurement requires scoring response options. The initial approach to scoring the Environment dimension involved a simple counting approach:
 - 1 = More than two environmental problems
 - 2 = Two environmental problems
 - 3 = One environmental problem
 - 5 = Zero environmental problems
14. It was acknowledged that a simple counting approach “may introduce understatement or overstatement of environmental deprivation. A person who faces a single environmental problem of very severe air pollution may be worse off than a person who suffers several more moderate environmental problems, such as exposure to traffic, pools of water where mosquitoes breed, and other noise during the day.”²²

1. Initial IDM revision and considerations

15. As part of a program of work to ready the IDM for global use, an extensive methodological review was undertaken.²³ For the Environment dimension, two further themes and related questions were added to the existing focus on environmental problems (Table 1):
 - (a) natural resource utilisation, which covered biomass fuel availability, reflecting evidence

of increasing scarcities affecting people in rural areas and related negative environmental impacts;^{24,25} and wild harvesting of non-cultivated plants or animals for purposes other than as fuel (which was assessed in the Energy dimension). This theme also addressed availability, security and reliability of resources, given relevance for rural livelihoods.^{26,27} (b) safe environment, to capture some of the risks in the environment associated with engaging in activities such as collecting water from sources far from the home.

Table 1
Environment dimension, revised IDM survey

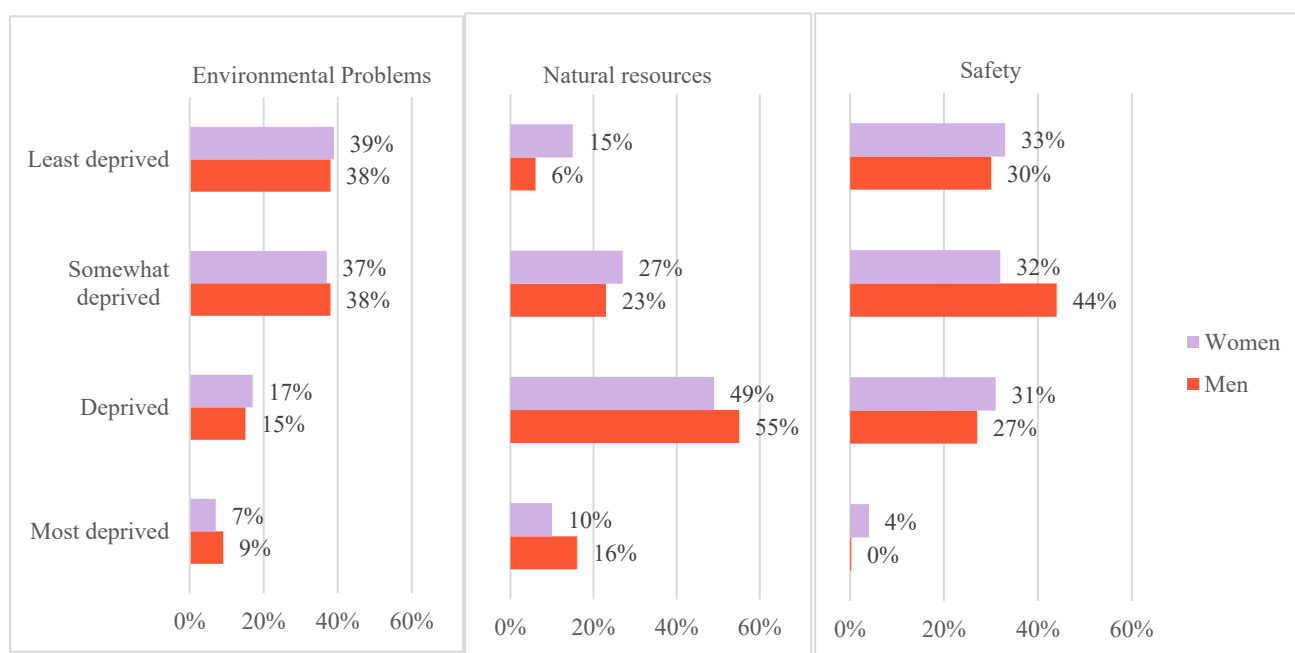
Dimension	Themes	Indicator
Environment	Exposure to environmental problems	Exposure to environmental problems
	Natural resource utilisation	Wild resource utilisation Biomass fuel utilisation
	Safe environment	Safe environment

16. Several additional environment-related questions were also added to the survey to gather information about vulnerability to poverty, but were not used for scoring. These asked about whether an individual had been exposed to major shocks or problems and whether they lived in a location subject to natural hazards.²⁸

2. Use of the revised IDM survey in the Solomon Islands, 2020

17. The revised measure and associated survey were used in a two-province study in the Solomon Islands in 2020. A total of 1862 respondents from 849 households participated.
18. Looking at dimension-level results, men in the sample scored as slightly more deprived than women, with 16 percent of men categorised as deprived or most deprived, compared to 13 percent of women. As items for this dimension use an individual's subjective assessment of objective circumstances, differences in scores may reflect gender differences in standards of assessment, or in the nature of engagement with the environment.²⁹
19. Dimension-level results also hid differences in the pattern of results by gender at the sub-dimension level. Women were more deprived in the safety in the environment theme and men were more deprived in natural resource utilisation theme (Figure 1).
20. Deprivation decreased slightly with age. There were only small differences in men's and women's score patterns across the age range.
21. The survey enabled respondents to nominate environmental problems experienced but not listed in the IDM survey. The most common issues identified were environmental degradation, particularly in water sources, caused by logging, followed by waste and environmental damage caused by pigs, and finally, sea level rise. Disturbances caused by people drinking, and resulting feelings of unsafety, were also frequently cited by participants as deprivations in the environment around their dwelling.³⁰ Solomon Islands stakeholders noted the lack of specific focus on the ocean as a measurement limitation, given its importance culturally, economically and for livelihoods in Pacific Island contexts. Adding factors specific to the respondents' environments was identified as a consideration in contextualising future surveys.³¹

Figure 1
 Percentage of men and women in each category of environment theme deprivation
 (environmental problems, natural resources, safety)



22. Primary data collection at the individual level also enables analysis of joint deprivations – deprivations that tend to be experienced together by particular population sub-groups or in particular areas. In the Solomon Islands sample, people who experienced deprivation in water also tended to experience deprivation in sanitation and environment.³²
23. The spatial distribution of Environment deprivation was compared with other information about forest canopy loss in the Solomon Islands. This identified relative overlap in terms of the geography of canopy density of less than 30 percent and level of deprivation in the Environment dimension.³³

C. From the IDM to Equality Insights

24. The original research to develop the IDM aimed for both comprehensiveness and parsimony. The process of methodological review and iteration over the period 2016-2020 increased survey length. In taking this work forward as Equality Insights, IWDA sought to re-emphasise parsimony, cost-effectiveness, and survey duration. A careful process of item reduction was undertaken, informed by: (i) statistical review of survey performance in five use contexts [Fiji (2016), Nepal (2017), Indonesia (2018), South Africa (2019) and Solomon Islands (2020)]; (ii) revisiting the original participatory research; and (iii) assessment of normative importance. Survey items were reduced by approximately 40 percent.³⁴
25. The revised Equality Insights Environment dimension included three themes:
 - (i) Pollution of air, water, soil (from industrial and domestic waste (i.e. garbage) and the health hazards arising from this, assessed at the household level. (Pollution/hazards arising from poor sanitation/lack of sewage disposal are dealt with in the sanitation module.)
 - (ii) Environmental risks (presence of pests/diseases arising from environmental conditions, natural hazards/disasters), assessed at the household level.

- (iii) Natural resource utilisation: changes in access, scarcity/ overexploitation, for those reliant on collecting and using natural resources for energy/fuel, water, other ecosystem services (wild foods, timber and building poles, medicinal plants and other plant products), assessed at the individual level.
26. The theme of safety in the environment was moved to a reconceptualised Safety dimension, to strengthen measure coherence.
27. Before the Equality Insights Plus survey could be tested in the field, the COVID-19 pandemic necessitated development of a new survey variant for phone-based administration, with initial use in Pacific Island countries. Relevant learnings from the development and use of Rapid will be incorporated in the face-to-face survey in due course.

D. Developing Equality Insights Rapid

28. The Pacific presents some unique challenges for non-face-to-face surveying, given geography (multiple small islands), remoteness and more limited internet and mobile phone penetration compared to other regions. Adapting the existing survey for remote administration involved extensive engagement with literature and evidence relevant to poverty measurement, survey modalities, gender, and the dimensions of Equality Insights. The work was supported by a Global Technical Advisory Group, including statistical experts from the Pacific Community, UN Women, the UN Economic and Social Commission for Asia and the Pacific, the International Labour Organisation, World Food Programme and the Australian Bureau of Statistics, regional and global gender experts, and potential users.³⁵
29. The decision to use Computer Assisted Telephone Interviewing (CATI) for Equality Insights Rapid required development of a significantly shorter survey and changes to the question format used for face-to-face enumeration. Achieving a short survey that covers 15 dimensions of life plus assets and demographic questions inevitably involves loss of detail and nuance. There are also fewer questions across which to separate the circumstances of respondents. For this reason, Equality Insights Rapid assesses individual circumstances on a three-point scale (rather than the four-point scale used for the face-to-face Equality Insights survey), with the aim to identify moderate to severe deprivation at a point in time. It can be regarded as a ‘red-flagging tool’ that alerts policy makers to areas or social groups that may require further attention, and strengthens evidence to inform a more inclusive recovery.
30. Equality Insights Rapid retains key conceptual and methodological features of the longer Equality Insights face-to-face survey including:
- (i) individual-level data collection from all adult household members, to enable insight into differences within households, plus a brief household survey completed by one household member, to efficiently obtain data about circumstances shared by all household members;
 - (ii) assessment of 15 dimensions of life plus assets, and demographic information that enables disaggregation by gender, age, disability and other characteristics as relevant;
 - (iii) assessment of poverty on a scale, to recognise different levels of deprivation.
31. After reflecting on key considerations, literature and consultation with sector experts, the conceptual structure of the Environment dimension in Equality Insights Rapid was designed, focusing on exposure to natural hazards and pollution (Table 2). Exposure to natural hazards is assessed via two survey items: (i) a question in the household survey about the severity of impact of natural hazards on household property; and (ii) a question in the individual survey that assesses severity of impact of natural hazards on the respondent’s daily activities. Extent of exposure to pollution around the home is assessed at household level and modelled on an item in previous IDM surveys. Given brevity needs, the item focuses on air, water and soil

pollution, to align with SDG target 3.9 (“substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination”).

Table 2
Environment dimension, Equality Insights Rapid

Dimension	Intended Measurement	Actual measurement	Variable
Environment	Exposure to natural hazards	Severity of natural hazard exposure on home	Severity of natural hazard exposure on home
		Severity of natural hazard exposure on daily activities	Severity of natural hazard exposure on daily activities
	Exposure to pollution	Extent of exposure to pollution	Exposure to air pollution
			Exposure to water pollution
Exposure to soil pollution			

32. People who experience exposure to two or three forms of pollution (air, land, water), or perform daily activities that are severely impacted by natural hazards are categorised as experiencing severe deprivation (Table 3). Those who do not meet the threshold for deprivation experience no pollution or natural hazards that impact their household. Their daily activities are also less than moderately impacted by natural hazards.
33. The first use of this new survey instrument in Tonga in 2022 provides a practical test of the result, in a specific context. The survey methodology and illustrative results are outlined in the following section. The overall performance of the survey will be reviewed, drawing on the use experience and data, consistent with IWDA’s ongoing commitment to strengthen individual-level gender-sensitive poverty measurement. Learning will be particularly useful in the Pacific, where local call centres were established for the Rapid survey, and in both countries the Rapid survey was the first substantial survey conducted using CATI.

Table 3.
Scoring thresholds for Environment dimension deprivation

Score	Criteria
Severe deprivation	Experience with two or three forms of pollution (air, land, water) OR Daily activities at least severely impacted by natural hazards OR Natural hazards affecting the household location AND daily activities at least moderately impacted by natural hazards
Moderate deprivation	Experience with at least one form of pollution (air, land, water) OR Natural hazards affecting the household location OR Daily activities moderately impacted by natural hazards
Does not meet deprivation threshold	No experiences of air, land, or water pollution AND No natural hazards affecting the household location AND Daily activities less than moderately impacted by natural hazards

3. Equality Insights Rapid Tonga Survey 2022³⁶

(a) Survey purpose and context

34. The purpose of the survey was to gain new, current, individual-level, gender-sensitive and intersectional data about multidimensional poverty to inform COVID-19 recovery efforts. Tonga is the first country in the Pacific to officially conduct individual-level assessment of multidimensional poverty as well as household-level assessment.
35. The eruption of the Hunga Tonga-Hunga Ha'apai volcano and related tsunami that occurred in Tonga on 15 January 2022 significantly affected most of the Tongan population and disrupted social and economic activity. The detrimental impacts of the tsunami are estimated to have caused damage equivalent to 19 percent of Gross Domestic Product (GDP)³⁷. An event of this scale inevitably influences data collected in the months following, and may overwhelm other influences. Differences that might otherwise have been visible in data may be masked by the widespread, shared experience of natural disaster.

(b) Survey design and sampling

36. IWDA collaborated with the Tonga Statistics Department (TSD) and the Ministry of Internal Affairs, Women's Affairs and Gender Equality Division (MIA/WAGED) to undertake a nationally representative survey. TSD designed the sample and undertook data collection between 17 May 2022 and 30 June 2022 from a Tongatapu-based call centre.
37. A multi-stage, stratified cluster sampling approach was used. Five strata were identified using the TSD census designations and 214 census block enumeration areas (EAs) were randomly selected proportionate to population size per strata: Tongatapu urban, Tongatapu rural, Vava'u, Ha'apai, and Eua. The remaining census strata of Niuas was excluded based on remote location and limited population size. Twelve households were randomly selected per EA, with two households identified as reserves in each EA.³⁸
38. To be eligible, respondents must have been a member of the household at the time of TSD's 2021 household listing exercise (prior to the volcanic eruption) and a member of the same household at the time of data collection (after the volcanic eruption). The perspectives of respondents who had moved to another household are not part of this dataset. Some 3.1 percent of adult household members who were unable to communicate independently on a phone represent another important group that did not participate in the data collection.
39. All eligible adults in a sampled household were surveyed individually, with the household survey used to identify all eligible household members and collect information on a limited number of questions where circumstances are reasonably similar for all household members. Survey instruments, study design, and implementation procedures were informed by global standards for Equality Insights Rapid and contextualised with TSD.³⁹ Survey modifications were minimal; the most notable change was removal of demographic questions related to biological sex. The contextualised survey was translated from English to Tongan and from Tongan to English.

(c) Demographics

40. The final dataset included 6703 individuals from 2551 households⁴⁰ For the purposes of this Working Paper, we consider results by gender, age, disability status, and location (Table 3).

Table 3.
Respondent key demographic characteristics, Equality Insights Rapid Tonga
Survey 2022

	Number of respondents	Unweighted percentage	Weighted ⁴¹ percentage
Overall	6,703	100	100
Gender			
Man	2,902	43.30	43.57
Woman	3,800	56.70	56.43
Age			
18-29	1,893	28.24	28.25
30-44	2,055	30.66	31.37
45-59	1,700	25.36	24.64
60+	1,055	15.74	15.74
Disability			
Without a disability	6454	96.29	96.47
With a disability	249	3.71	3.53
Location			
Urban	1,507	22.48	23.95
Rural	5,196	77.52	76.05

41. The ability to disaggregate data by sex and gender is critically important. Most population-based surveys focus on sex disaggregation, but identifying gender is crucial to influencing gender-specific policy making. Sex disaggregation is important when biological sex is directly relevant to the measure, such as menstruation and pregnancy. Transgender and intersex individuals may experience deeper exclusion or marginalisation linked to the divergence in their biological characteristics and their gender identity.
42. As a gender-sensitive measure of multidimensional poverty, Equality Insights surveys prioritise gender-disaggregation. As surveys address issues related to biological characteristics of female bodies such as menstruation, pregnancy, and childbirth, in developing Rapid, careful consideration was given to determining how to safely, respectfully, and inclusively, ask questions related to gender and sex. The Demographic module of the Equality Insights Rapid global survey instrument asks respondents to share their gender.⁴² Depending on perceived appropriateness of these questions in specific contexts, the survey then asks if their sex assigned at birth accords with their gender identity. In contexts where there are known third genders, those categories will be included. If a respondent indicates that neither classification of man nor woman aligns with their gender identity, or that their sex assigned at birth is dissimilar to their gender identity, the respondent will be asked if they are comfortable disclosing sex assigned at birth.
43. In Tonga, consistent with other surveys conducted by TSD, survey respondents were asked whether they identified as a man or woman, with the CATI question framed to allow a numerical response. A little more than half of respondents (56%) identified as a woman.
44. Equality Insights Rapid samples adults of all ages, to reflect the importance of age as an influence on experience generally and as it intersects with gender. This addresses a significant limitation of other multitopic surveys in regular use, including the Demographic and Health Survey (DHS) and the Multiple Indicators Cluster Survey (MICS), which only sample women of reproductive age. Multidimensional poverty measures that draw on this data do not reflect the situation of women over 50 – a cohort in many countries that has not

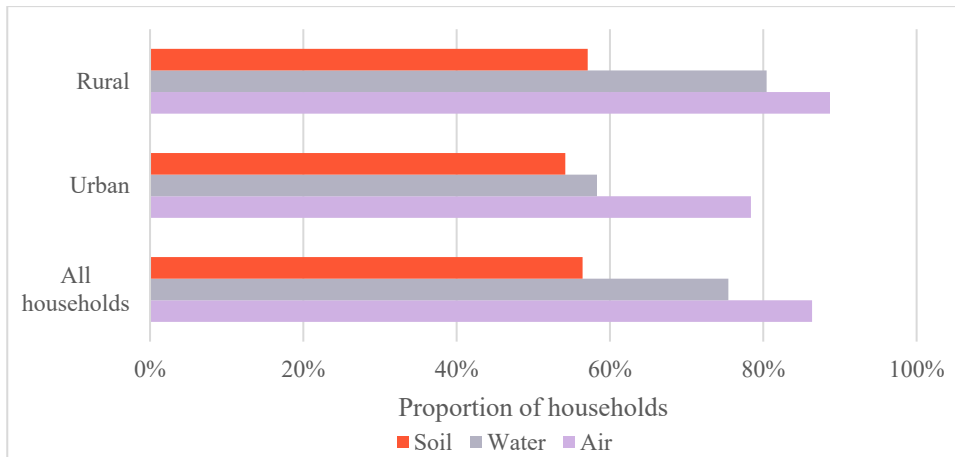
benefited from more recent action to address gender inequality and whose circumstances reflect the cumulative impact of gender inequality over time.

45. In Tonga, respondents ranged in age from 18 to 98, with a median age of 40. For reporting purposes age is presented in three categories: 18 - 29 (28% of respondents), 30 - 59 (56%), and 60 and above (16%). However, analysis and reporting by other age ranges is possible.
46. Equality Insights Rapid identifies disability using the Washington Group Short Set questions, which assess functional impairment across six key areas. For this Paper, respondents are classified as having a disability if they reported having a lot of difficulty with, or could not do at all, any of the questions. Using this definition, 3.7 percent of respondents in Tonga were considered to be living with a disability. As ability to communicate independently by phone was a requirement for inclusion, the survey may underrepresent the experiences of people with disabilities that impact communication.

(d) Results

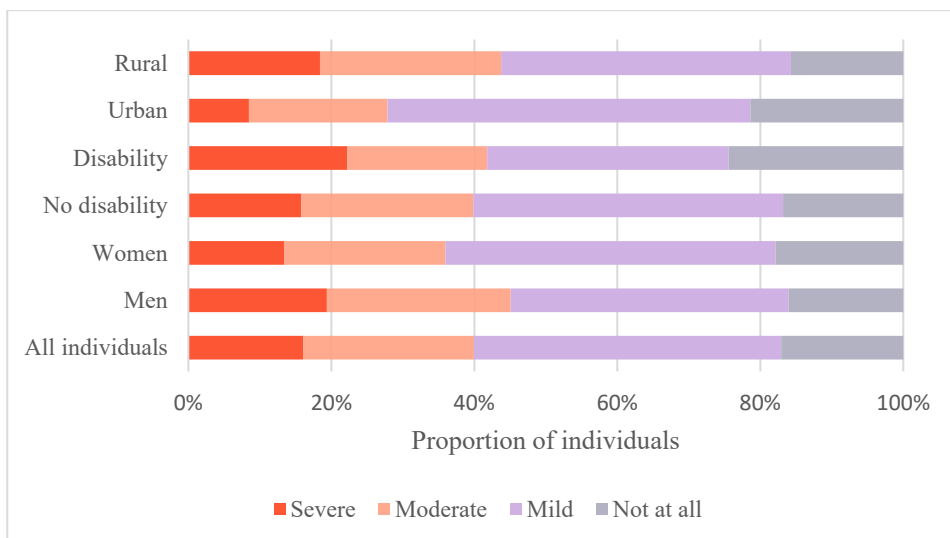
47. The report of the Equality Insights Rapid Tonga Survey 2022 will be launched in June 2023 and made available publicly at that time.⁴³ This section shares selected results to illustrate the kinds of insights that are possible, and the value of individual-level data collection.
48. Results overall pointed to the significant impact of the volcanic eruption and related tsunamis on air and water pollution as well as on water security. The widespread impact of the natural disaster is evident in the dimension-level results: some 94 percent of respondents met the threshold for either moderate or severe deprivation. No gender, age or disability difference is visible at this aggregate level; negative impacts appear population-wide in affected areas.
49. Examining question-level results provides further insights. Using the household survey questions, more than half (60%) of Tongan households reported experiencing a harmful impact on their property from natural hazards in the past year. For many households, the impact was mild (48%) or moderate (10%). Only 1.9 percent reported a severe impact on their property.
50. When asked about air, water or soil pollution at or near their home, a high percentage of household survey respondents highlighted significant problems in the past 12 months (Figure 2). Air pollution (air that smells bad or makes your eyes or throat sting) was reported by 86 percent of household survey respondents, while 75 percent identified that water pollution has been a significant problem (including water that smells, makes you sick when you drink it, or itchy when you wash in it; open drains with sewage; or pools of water where mosquitos or other disease carrying insects breed). More than half of households (56%) reported a significant problem with soil pollution (such as large amounts of rubbish or a waste disposal site; storage or disposal sites of unsecured agricultural or industrial chemicals, or other hazardous waste). A higher proportion of households from rural areas, compared to urban locations, identified a significant problem with pollution impacts in the past 12 months, especially water pollution.

Figure 2
 Percentage of households that experienced a significant problem with pollution in past 12 months, by type of pollution and location.



51. As noted earlier, collection of primary data at the individual level enables analysis that provides further insight into areas of vulnerability, to inform recovery and future preparedness. A vast majority of individuals (83%) reported that their daily activities had been impacted by natural hazards in the past 12 months. Forty percent of respondents reported being either severely (16%) or moderately impacted (24%). Forty-three percent reported being impacted only to a minor extent (Figure 3).
52. While differences between urban and rural experiences were similar to the household level findings, analysis of this question by individual demographic variables showed some groups reported greater impacts than others. Men were more likely to report severe or moderate impacts on their daily lives (45% compared to 36% of women). People with a disability were also more likely to report being severely impacted (22%). This suggests that while households may be exposed to natural hazards together, individual experiences of the event may differ within the household.

Figure 3
 Percentage of individuals within demographic groups experiencing impact from natural hazards (by extent of impact)



III. Reflections and directions

53. Inclusion of Environment as a dimension of an individual-level, gender-sensitive measure of multidimensional poverty recognises the importance of the environment as a factor influencing poverty and inequality. Primary data collection at the individual-level enables analysis of data by gender, age, disability and location to understand how circumstances vary and support action connected to lived realities.
54. Initial analysis of Equality Insights Rapid data in Tonga suggests there are differences in experience of natural hazards by gender, with men reporting more severe impacts on daily life. As noted earlier, this may reflect differences in standards of assessment or differences in experience arising from differences in interaction with the environment associated with roles and responsibilities. Due to the nature of the phone survey and the need for brevity, most environment questions were asked at the household level, which limits the ability to explore these differences. Future surveys, with fewer constraints associated with scope and modality, may uncover more differences in experience by asking all questions at an individual level.
55. The environment data reported here has been collected as a component of multidimensional poverty. Further analysis that considers individual experiences in relation to other dimensions – for example water, shelter and food – may provide further insights on gendered experiences of natural hazards and other related environmental impacts.
56. The Environment dimension of Equality Insights Rapid captures limited but important data about environmental problems, hazards and harms and their implications for people’s lives. The measure’s most important contribution to the gender and environment data landscape will be deepening understanding of the relationship between the Environment dimension and other social and economic dimensions, and the broader implications of environmental problems, hazards and harms.
57. The nature and scope of the Equality Insights Rapid data set enables data to be explored in multiple ways. Further analysis exploring interactions between water, shelter and environment in the context of the Tongan volcanic eruption will be published later in 2023.

1 Joanne Crawford, Gender and poverty as a feminist foreign policy priority: Opportunities to accelerate action, Australian Feminist Foreign Policy Coalition Issue Paper Series No. 10. February 2023.

2 Scott Wisor, Sharon Bessell, Fatima Castillo, Joanne Crawford, Kieran Donaghue, Janet Hunt, Alison Jaggard, Amy Liu and Thomas Pogge, Individual Deprivation Measure – a gender sensitive approach to poverty measurement, Melbourne, International Women’s Development Agency, 2014 Available at <https://equalityinsights.org/wp-content/uploads/2014/08/The-IDM-Research-Report.pdf>

3 Hunt, Janet, Bessell, Sharon, Crawford, Joanne, Fisk, Kylie, Nguyen, Hieu, Pham, Trang, Suich, Helen & Yap, Mandy. 2017. The Individual Deprivation Measure: Methodology Update 2017. Australian National University, Canberra and International Women’s Development Agency, Melbourne. Available at https://equalityinsights.org/wp-content/uploads/2017/12/Methodology_Update_2017_FINAL.pdf

4 Caperna, Giulio & Papadimitriou, Eleni. 2020. JRC Statistical Audit of the Individual Deprivation Measure, Joint Research Centre. EUR 30320 EN, Publications Office of the European Union, Luxembourg. Available at <https://equalityinsights.org/wp-content/uploads/2021/01/JRC-Statistical-Audit-of-the-Individual-Deprivation-Measure-2020.pdf>

5 Following completion of the IDM program, IWDA's *Equality Insights* team reviewed statistical performance of IDM items in five countries to inform item reduction for the *Equality Insights Plus* face-to-face survey. This provided a base for developing *Equality Insights Rapid*. See Melissa Meinhart and Cheryl Russell. 2022. *Equality Insights Rapid: Tool Development Report*. Melbourne, International Women's Development Agency.

<https://equalityinsights.org/resources/equality-insights-rapid-tool-development-report/>

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19 Development of the Individual Deprivation Measure (IDM) was a collaborative intellectual endeavour commencing in 2008, to which many contributed. The original research that developed the IDM was a four-year, international, interdisciplinary research collaboration led by the Australian National University (ANU), in partnership with IWDA and the Philippine Health and Social Science Association, University of Colorado at Boulder, and Oxfam Great Britain (Southern Africa), with additional support from Oxfam America and Oslo University. It was funded by the Australian Research Council (LP0989385) and partner organisations. Subsequent IDM research undertaken in Fiji was led by IWDA in partnership with the Fiji Bureau of Statistics. It was funded by the Australian Government's Pacific Women Shaping Pacific Development program in Fiji. From 2016-2020, a four-year program of work to ready the IDM for global use was undertaken in partnership by the ANU and IWDA, funded by the Australian Government.

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- 31 Fisk et. al. 2020: 56
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- 34 Crawford et al. 2021. The Equality Insights face-to-face survey was initially referred to as the ‘Insights’ survey. In developing the Rapid version of the survey, the longer version of the survey was renamed as Equality Insights Plus.
- 35 . The process of developing Equality Insights Rapid as a global tool is detailed in Meinhart & Russel 2022.
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- 37 World Bank. *Pacific Economic Update*. February 2023: 14.
<https://thedocs.worldbank.org/en/doc/b4ba519c39ea4804a03aee6fa188d894-0070012023/original/Pacific-Economic-Update-February-2023.pdf>
- 38 For further details, see Carroll, M., Greaves, A., Crawford, J., Pradela, J., 2023. *Equality Insights Rapid: Report, Tonga Survey 2022*, Melbourne: International Women’s Development Agency (forthcoming)
- 39 See Meinhart & Russell 2022.
- 40 Carroll et. al. 2023 (forthcoming)
- 41 Analysis of the Equality Insights Rapid Tonga data is weighted based on the probability of an individual to be selected. Individuals within a household have uniform probability weights, computed by using the percentage of adults in the current household who participated in the survey and the household weight. The household probability weights were computed using the probability of EA selection and the probability of household selection within the selected EA.
- 42 Björneskog L. Testing questions about sex and gender identity [Internet]. UNECE Work Session on Gender Statistics; 2019 May 15; Sweden. Available from:
https://unece.org/fileadmin/DAM/stats/documents/ece/ces/ge.30/2019/mtg1/WP32_Bjorneskog_slides_rev_ENG.pdf
- 43 The Equality Insights Rapid Tonga Survey 2022 results shared here should be regarded as preliminary until the report is launched in Tonga in early June. We ask that these not be shared publicly beyond working group participants until the report is available publicly on the Equality Insights website (expected 12 June 2023).