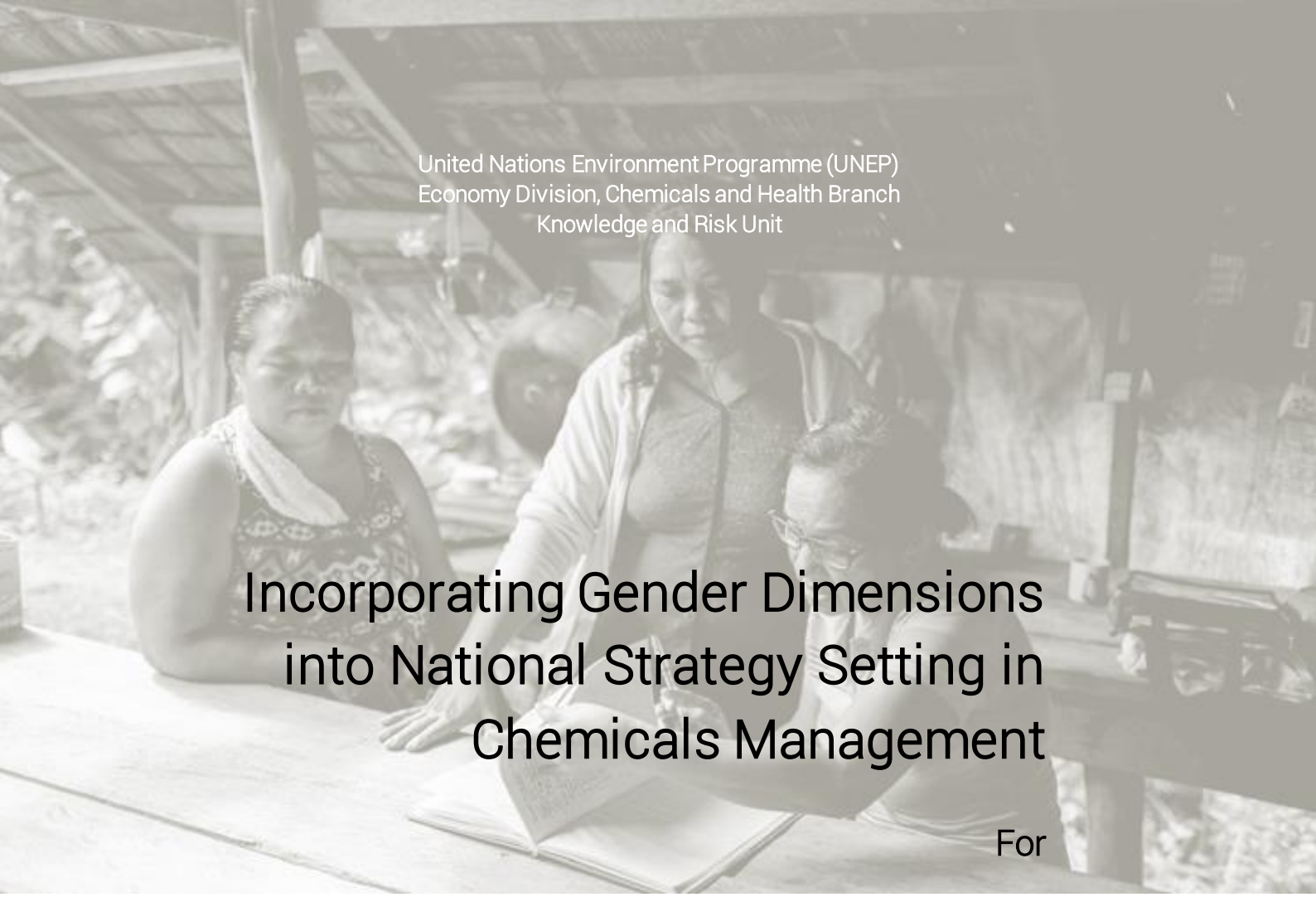

United Nations Environment Programme (UNEP)
Economy Division, Chemicals and Health Branch
Knowledge and Risk Unit

Incorporating Gender Dimensions into National Strategy Setting in Chemicals Management

For

Minamata Convention National Action Plans for Artisanal and Small-scale Gold Mining

and

Stockholm Convention National Implementation Plans

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The United Nations Environment Programme (UNEP) is the leading global environmental authority that sets the global environmental agenda, promotes the coherent implementation of the environmental dimension of sustainable development within the United Nations system, and serves as an authoritative advocate for the global environment.

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About this Document

As the world celebrates the 20th anniversary of the Stockholm Convention and the 4th anniversary of the Minamata Convention in 2021, a historical opportunity is within reach to detoxify our future.

The two Conventions strive to minimize the harmful effects of mercury and persistent organic pollutants (POPs) on human health and the environment. This joint guidance to mainstream gender considerations into the sound management of chemicals will support countries to better understand the interplay between sex, gender, and the multifaceted harmful impacts associated with exposure to mercury and POPs. It is only by bridging this knowledge gap that Stockholm Convention National Implementation Plans (NIPs) and Minamata National Action Plans (NAPs) can be optimized to address the disproportionate social, economic, health, and environmental burden that falls on those vulnerable social groups most at risk such as women, children, occupational workers, refugees, and people living in poverty. By injecting gender equality in the equation of chemicals management through gender-smart NIPs and NAPs, countries can reap development co-benefits that contribute to a global green recovery as we walk through the decade of action to meet the SDGs by 2030.

This joint guidance has been developed to support gender mainstreaming in the development of artisanal and small-scale gold mining National Action Plans in line with Annex C of the Minamata Convention on Mercury, as well as for the development of National Implementation Plans for the management of persistent organic pollutants in line with the Stockholm Convention. This document was developed based on insights from a literature review of the available resources. Relevant data, approaches, lessons learned, and good practices were examined and used to develop a first draft of the guidelines. The preliminary version of the guidelines was then tested in pilot countries that were selected based on specific criteria related to readiness and geography. The feedback received from the pilot countries, together with comments and inputs collected from resource persons and peer reviewers were then triangulated and reflected in the final version of these guidelines.

Key Findings and Recommendations

The Minamata Convention National Action Plans (NAPs) for Artisanal and Small-scale Gold Mining

Gender Context in the ASGM

- ✓ An estimated 15 million people work in ASGM globally – including 4.5 million women. Despite women making up 30% of the global ASGM workforce, their work is often undervalued and impeded.
- ✓ The involvement and role of women and men varies widely from one country to another. For example, in Peru, where up to 15% of all ASGM jobs are held by women, many are only allowed to work as waste rock collectors who earn on average less than minimum wages, and in Uganda, where up to 45% of all ASGM job are occupied by women, they earn up to 60% less for the same ASGM job than men.
- ✓ Women face discrimination at all stages of the ASGM value chain. For example, superstitions and perception of women as physically weak lead to them being relegated to mostly working in shallow pits and scavenging from waste rock dumps and tailings or pushed to more dangerous work of mercury amalgamation. On the other hand, men are more likely to work in underground extraction under dangerous conditions, resulting in higher numbers of injuries and fatalities amongst men.
- ✓ Challenges associated with the gender inequalities in the ASGM sector include i) policy, regulatory and institutional aspects, for example limited gender mainstreaming capacity within institutions, ii) socio-economic aspects, for example women's work is often constrained by their domestic responsibilities, iii) limited access to opportunities and resources, for example low literacy rates impede many women's ability to access opportunities and acquire skills, and iv) health and safety aspects, for example women are often at higher risk of mercury exposure due to the division of labour.
- ✓ Overcoming the barriers to mainstreaming gender into ASGM is possible using a variety of approaches, including: i) enabling collective action, for example through establishment of women's mining cooperatives, savings clubs and miners' associations, ii) providing services and resources, for example by creating financial products specifically targeted at women miners, and lastly, iii) design and implementation of interventions with a gender perspective, for example by organizing gender awareness workshops for policymakers and miners to promote gender-inclusive policies in the mines themselves.

Key interventions to mainstream gender into the implementation of the NAP

In the process of NAP development:

- ✓ In order to **engage stakeholders and guarantee consultative process,** i) ensure that the stakeholder advisory group includes both women and men, ii) identify and engage civil society and women support groups working on gender aspects, and iii) ensure mechanisms to encourage equal participation of women and men, such as timing, language and safe space for the expression of ideas and opinions.

- ✓ During **data collection**, i) consider the roles of women and men along the ASGM value chain and their availability in planning data collection, ii) ensure gender representation among informants to encourage openness as women may be more comfortable talking to women, and iii) allow enough time for data collection to be able to obtain detailed information on gender relations.

- ✓ While **setting goals and strategies** under NAP document, i) ensure diversity of voices representing different gender roles, levels of access to resources and decision-making, ii) ensure that the views, objections and recommendations of stakeholders, both women and men, inform the development and implementation of the project, and iii) make sure that enough time is allocated and that strategies are based on the roles of women and men at work and home.

- ✓ The **evaluation plan** should demonstrate how data on gender relevant indicators will be collected. All data should be broken down by sex and gender to measure outcomes and impacts on women and men. The results of the **monitoring and evaluation** should indicate whether and how the beneficiaries, both men and women, were affected by the intervention.

While developing strategic content of the NAP:

- ✓ In developing **technical and environmental strategies**, i) ensure that both, women and men, receive appropriate training for adapting and implementing alternative mercury-free methods, ii) ensure that options for technical improvements are accompanied by funding solutions accessible to women and men, and iii) involve women in consultations and planning for the mercury-free technology transfer by considering their current and future roles.

- ✓ In developing **policy, regulatory and institutional strategies**, i) ensure equal participation of men and women, by providing equal access and opportunity to acquire property rights and the facilitation of equitable access to minerals, and ii) build capacity building in women's organizations to give them a voice, by providing targeted training.

- ✓ In developing **health related strategies**, i) ensure women are aware of the dangers of mercury exposure, support behavioral change and take necessary precautions, and ii) ensure that women have the same opportunities as men to access tests and other health services, including access to adequate pre and postnatal care.

- ✓ In developing **socio-economic strategies**, i) advocate for the provision of childcare facilities to prevent children being brought to mining sites, ii) support women-only savings clubs to improve access to capital to invest in mercury-free technologies, and iii) ensure that community outreach programs deliver gender integrated messages and are accessible to both women and men living in remote mining communities.

The National Implementation Plans (NIPs) of the Stockholm Convention

Gender Context in the Management of POPs

- ✓ Overall and despite the noticeable progress achieved over the last two decades since the adoption of the Stockholm Convention, gender considerations in the context of POPs management remain largely understudied and underrecognized.

- ✓ While we recognize the bio-magnifying and persistent nature of POPs and acknowledge the mounting scientific evidence pointing to their probable adverse impacts on human health and the environment, we also need to walk the extra mile to understand their gendered impacts.

- ✓ The glass can be described as half empty in light of the several challenges facing gender-responsive management of POPs. While some aspects related to sex and biology were studied to some extent in terms of how males and females are exposed to POPs and how they are affected, in most cases, we know very little at best about the interplay between complex gender dynamics and the cumulative impacts associated with the exposure of women and men to these harmful chemicals.

- ✓ By applying gender lenses to unpack the multifaceted impacts of POPs on human health and the environment, it becomes clear that women and men are not affected the same way, that the socio-economic and health burden associated with exposure to POPs can shift based on gendered norms, stereotypes, perceptions and the social roles assigned to both women and men within a given social context.

- ✓ Gender-differentiated exposure to POPs could be explained by various underlying social and cultural determinants. While such prevailing norms may not be challenged overnight, by identifying entry points to mainstream gender into the strategies and action plans for the management of POPs, such assumptions could be challenged over time to uproot the drivers of gender inequalities affecting those most vulnerable to the harmful effects of chemicals and wastes containing or contaminated with POPs.

- ✓ There are potential blind-spot in POPs-centric policies and interventions, because women may not be considered as frontline users, they may not fully benefit from preventive measures, hazards warnings, training on POPs management, and other awareness-raising interventions meant to prevent the harmful effects of POPs.

- ✓ Policymakers and practitioners managing POPs can reverse the tide, bridge the gender gap and shape gender-informed transitions to more inclusive and greener economies as part of the stimulus packages in the aftermath of the COVID-19 pandemic.

Key interventions to mainstream gender into the implementation of NIP

1. Policy, regulation, and institutional frameworks

- ✓ To develop gender-responsive national legislations such as laws, bills, and decrees which provide the legal foundations for the sound disposal and management of POPs, national teams should be gender-balanced, receive gender-specific training, use gender-sensitive wording, and assign special quotas for the under-represented gender in decision-making bodies in charge of POPs governance. While doing so, countries should propose actionable measures to strengthen the science-policy interface to assess gender-related gaps in the existing legislations, to increase the political buy-in, and to introduce positive market signals and behavioural change incentives for gender-responsive management of POPs.

- ✓ To foster stakeholder's engagement in NIPs, special attention should be given to: engage women and men from all categories including vulnerable social groups and informal sectors or subsectors of the economy; create an enabling space where women, men,

children, vulnerable groups, and their representatives feel empowered to bring-in their perspectives; conduct extensive consultations with representatives of groups representing social categories most at risk such as women and children; and establish effective cross-sectoral and gender-sensitive communication channels using local languages, social media, and other tools.

- ✓ To enable sustainable and POPs-free development in SIDs and LDCs, due consideration should be given to: using gender-balanced teams to deploy technological solutions that are fit for purpose considering economies of scale and recycling in the context of blue economy; associating technology transfer with transfer of capacities that are compatible with women's caregiving responsibilities; develop gender-responsive and integrated financing schemes to close the funding gap towards POPs-free development pathways, including through the use of gender-sensitive budgeting.

2. Technical and environmental aspects

- ✓ To develop and monitor POPs inventories, countries should: seek gender balance while hiring experts and designating negotiators; collect sex and gender-disaggregated data as part of their monitoring efforts; conduct gender-sensitive POPs inventories; and adopt sex and gender-differentiated POPs monitoring mechanisms.

- ✓ While fostering safer alternatives to POPs, countries should: enable vulnerable groups such as women to access productive assets and financial services; use sex-disaggregated estimates to assess the costs of exposure to POPs and promote safer alternatives; empower women using a mix of policy and economic tools to join the R&D workforce and break the glass ceilings; enable women to fully participate and benefit as such from the adoption of safer alternatives to POPs; and raise awareness to ensure women among other vulnerable social groups are also aware of the safer alternatives.

- ✓ To foster innovations and greener technologies, countries should: close the gender gaps in wages, leadership positions and science scholarships while promoting research and development; empower women to benefit from technology transfers and graduate from low-skilled and less-paying jobs; encourage women-led start-ups and local businesses having a gender-balanced workforce while promoting innovation-based ecosystems; capture women's know-hows together with men's while combining traditional solutions with novel concepts and technological breakthroughs to increase the uptake of innovation; empower women to become agents of change and challenge pre-established gender stereotypes and perceptions; raise awareness about POPs-free technologies and innovations among women groups within industries perceived as men-dominated; and promote the use of innovations and technologies to address the gendered burden of air pollution.

- ✓ To generate knowledge and disseminate best practices, countries should: create knowledge management platforms to bridge the gap and build a growing body of knowledge among POPs' practitioners, policymakers and gender specialists at national and global levels; build institutional capacities on gender mainstreaming that are diffuse to multiple stakeholders; and ensure that technological solutions are not only used at the high end but also at the lower end of the gendered value chains using POPs.

3. Health aspects

- ✓ To reduce the health burden and the economic footprint resulting from exposure to POPs, countries should: invest in gender-sensitive and sex-disaggregated data to understand the interplay between sex/gender, exposure, and impacts; establish gender task forces to mainstream gender into research frameworks and protocols; raise awareness about the scope of exposure among vulnerable groups such as women of reproductive age and children living in economic hardship; and provide the broader picture showcasing the true cumulative cost associated with exposure to POPs.

- ✓ To strengthen the science-policy interface applicable to POPs management, countries should: establish permanent forums where scientists and policymakers can engage each other on the best available gender-sensitive knowledge and policies to curb the health and environmental burden of POPs; and enhance cooperation between researchers and policymakers to strengthen the science-policy interface, address emerging issues as well as knowledge gaps.

- ✓ To raise awareness and build human and institutional capacities (health professionals), countries should unpack the many ways through which public health could be exposed to POPs and the resulting harmful effects using gender lenses to ensure women, men, and vulnerable social groups do fully understand the scope in which they could be exposed and affected.

4. Socio-economic aspects

- ✓ To reduce exposure to POPs, countries should: conduct gender-inclusive awareness raising about the multiple sources of exposure and products containing POPs; ensure that women of reproductive age are assigned low-risk roles along the value chain to mitigate the health burden on the future generation; combine a human rights-based approach with economic incentives to promote children's education and reduce child labor practices in sectors exposed to POPs; and reduce emissions of atmospheric POPs through greener alternatives to harmful energy sources used in households.

- ✓ To enhance resilience to POPs among the most vulnerable social groups, countries should: enable women and men to access better inputs and build their technical skills to improve business performance; facilitate women's access to social security services, financial services and productive assets to boost their livelihoods; and structure occupational workers in the informal economy into social units or professional structures that can provide a set of social services and defend their interests.

- ✓ To raise awareness and build capacities (vulnerable groups), countries should: combine a twofold gender-responsive approach to raising awareness in the context of chemicals and waste while also supporting alternative livelihoods; promote content tailored to address specific gender-sensitive concerns using mobile technology and cognitive sciences; and mainstream gender-sensitive and inclusive communication channels to decode complex guidelines into simple messages that are context-specific and adapted to the target audiences using local languages.

- ✓ To access financing and promote alternatives to risky behaviours, countries should: empower women and men through financial literacy training to access traditional financing services as well as innovative forms of financing; promote gender-responsive micro-financing alternatives; and apply gender-sensitive budgeting.

Key Recommendations

1. Critical investments are needed to better understand the complex interplay between exposure to POPs and mercury and gendered norms, poverty, socio-economic status, access to health services, level of education, access to productive assets, representation in leadership positions and decision-making processes.

Different social groups within the same population could be differently affected by chemicals based on the complex interplay between exposure and gendered norms, poverty, socio-economic status, access to health services, level of education, access to productive assets, representation in leadership positions and decision-making processes. Health problems resulting from exposure to chemicals imply additional costs in the absence of social security schemes and limit the time that men and women can dedicate to paid labor thus exacerbating existing gender inequalities and sustaining the vicious cycle of multigenerational poverty.

2. Better results could be achieved by combining a human rights approach to mainstreaming gender equality into chemicals management with other complementary approaches

Gender equality is a well-recognized global priority that is often addressed from a human rights perspective. While a human rights approach founded on international obligations remains fundamental to advancing the gender equality agenda, greater results could be achieved when complementary approaches are used such as making a business case for gender mainstreaming to rally private sector, or by bridging the gender data gap to uncover the invisible drivers of gender inequality and unlock opportunities to empower women, men, and other social groups to become part of the solution towards achieving the SDGs.

3. Decoding the gender dynamics in chemicals management starts with bridging the gender data gap

While we have seen huge efforts deployed over the last years and promising results achieved to mainstream gender across MEAs in the areas of climate change adaptation, biodiversity conservation, and chemicals management, it is only by overcoming the gender data challenge that we can truly understand the gender dynamics in the context of chemicals management, understand how such dynamics drive inequalities, to design and implement a new generation of gender-smart NAPs and NIPs.

4. Gender-Smart NAPs and NIPs are not only essential to achieving SDG5, but could yield a wide range of development co-benefits across the 17 SDGs.

A new generation of gender-smart NAPs and NIPs will not only support SDG 5 on gender equality but also SDG 3 on ensuring healthy lives, SDG 8 on sustained, inclusive, and sustainable economic growth and SDG 12 on sustainable consumption and production. Even more, different social groups can be discriminately affected by POPs and mercury, thus exacerbating the existing inequalities, poverty, and vulnerabilities to climate change and environmental degradation to name just a few. Giving the interlinked nature of the SDGs, countries should strive to mainstream gender into the management of chemicals, to yield a wide range of development co-benefits across the 17 SDGs.

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Acronyms and Abbreviations

AFFECOR	Autonomisation des femmes par l'épargne et le credit communautaire responsable
AMV	Africa Mining Vision
ARM	Alliance for Responsible Mining
ASM	Artisanal and Small-Scale Mining
ASGM	Artisanal and Small-scale Gold Mining
AU	African Union
BGR	Bundesanstalt für Geowissenschaften und Rohstoffe
BRS	Basel, Rotterdam, and Stockholm
CBD	Convention on Biological Diversity
CBO	Community-based organizations
CEDAW	The Convention on the Elimination of all Forms of Discrimination Against Women
CIRDI	Canadian International Resources and Development Institute
CMMVI	Chronic metallic mercury vapor intoxication
COP	Conference of Parties
CSO	Civil Society Organisation
C&W	Chemicals and Waste
DDE	Dichlorodiphenyldichloroethylene
DDT	Dichlorodiphenyldichloroethane
DecaBDE	Decabromodiphenyl ether
DEHP	Di(2-ethylhexyl) phthalate
DFID	Department for International Development
DNA	Deoxyribonucleic Acid
DRC	The Democratic Republic of the Congo
EDC	Endocrine-disrupting chemical
EEA	European Economic Area
EMAF	Ellen Mcarthur Foundation
ESHIA	Environmental, social, and health impact assessments
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FFS	Farm Forest Schools
FGD	Focus Group Discussions
GAC	Global Affairs Canada
GAP	Gender Action Plan
GBV	Gender-Based Violence
GEF	Global Environmental Facility
GEFIEO	GEF Independent Evaluation Office
GHG	Greenhouse Gas
GiZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GOLD	Global Opportunities for Long-term Development
GRF	Gender Resource Facility
GTP II	The Growth and Transformation Plan II
GWMO	Guyana Women Miners Organization
HBCD	Hexabromocyclododecane
HCB	Hexachlorobenzene
HCH	Hexachlorocyclohexane
Hg	Mercury
HRBA	Human Rights-Based Approaches

KII	Key Informant Interview
ICESCR	The International Covenant on Economic, Social and Cultural Rights
ICGLR	International Conference on the Great Lakes Region
ICMM	International Council on Mining and Metals
ICTs	Information and communications technologies
IDRC	International Development Research Centre
IFC	International Finance Cooperation
IGF	Intergovernmental Forum on *Mining*, Minerals, Metals and Sustainable Development
IIED	International Institute for Environment and Development
IISD	International Institute for Sustainable Development
ILO	International Labour Organisation
ITU	International Telecommunication Union
KAP	Knowledge Attitudes and Practices
KEMI	Swedish Chemicals Agency
KM	Knowledge Management
LDCs	Least Developed Countries
LSM	Large Scale Mining
MEAs	Multilateral Environmental Agreements
MIA	Minamata Initial Assessment
MoMP	The Ministry of Mines and Petroleum
M&E	Monitoring and Evaluation
MNCR	National Movement of Waste Pickers in Brazil
NAP	National Action Plan
NEMA	National Environment Management Authority
NEPEM	Center for Study and Research on Women
NGO	Non-Governmental Organization
NIP	National Implementation Plan
OCDD	Octachlorodibenzodioxin
OCPs	Organochlorine Pesticides
OctaBDE	Octabromodiphenyl Ether
OECD	Organization for Economic Cooperation and Development
PAHs	Polycyclic Aromatic Hydrocarbons
PBDE	Polybrominated diphenyl ethers
PCB	Polychlorinated biphenyls
PCDD	Polychlorinated dibenzodioxins
PCDF	Polychlorinated dibenzofurans
PCM	Project Cycle Management
PEA	Political Economy Analysis
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctane Sulfonic Acid
POPs	Persistent organic pollutants
PPE	Personal Protective Equipment
PNG	Papua New Guinea
QSP	Quick Start Programme
R&D	Research and development
SAICM	Strategic Approach to International Chemicals Management
SAM	Sustainable Artisanal Mining
SEWA	Self Employed Women's Association
SDC	Swiss Agency for Development and Cooperation
SDG	Sustainable Development Goals

SDMR	Sustainable Development of Mining in Rwanda
SIDS	Small Islands Developing States
SSM	Small-scale miner
STDs	Sexually transmitted diseases
STI	Sexually Transmitted Illness
TDCPP	Chlorinated Phosphate Esters
ToR	Terms of Reference
TSD	treatment, storage, and disposal
UFMG	Federal University of Minas Gerais
UN	United Nations
UNDP	United Nations Development Programme
UNECA	United Nations Economic Commission for Africa
UNEG	United Nations Evaluation Group
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organisation
UNITAR	United Nations Institute for Training and Research
UPOPs	Unintentional POPs
US EPA	The United States Environmental Protection Agency
WECF	Women Engage for a Common Future
WEEE	Waste Electrical and Electronic Equipment
WHO	World Health Organisation
WIEGO	Women in Informal Employment: Globalizing and Organizing
WOLTS	Women's Land Tenure Security Project
ZAAMP	Zimbabwe Accountability and *Artisanal* Mining Programme
3Ts	Tin, Tantalum and Tungsten

Glossary of terms

Term	Definition/Description
Artisanal and small-scale mining	Mining conducted by individuals or groups of miners using basic methods of extraction and processing, with limited capital application and limited production.
Gender blind	Not considering whether someone is male or female when planning, not discriminating or distinguishing by gender.
Gender disaggregated	Data collected and presented separately for male and females.
Gender distributive	The balance between different gender groups.
Gender divide	The difference between women and men in a society.
Gender equality	State of equal access by women and men to resources and opportunities. The needs of both women and men are considered. It also includes equal participation and decision making.
Gender equity	"Fairness of treatment for women and men, according to their respective needs. This may include equal treatment or treatment that is different, but which is considered equivalent in terms of rights, benefits, obligations and opportunities" (International Labour Office [ILO], 2000)[1].
Gender mainstreaming	Gender mainstreaming is the public policy concept of assessing the different implications for people of different genders of any planned policy action, including legislation and programs, in all areas and levels. It involves the integration of a gender perspective into the preparation, design, implementation, monitoring and evaluation of policies, regulatory measures and spending programmes, with a view to promoting equality between women and men, and combating discrimination[2].
Gender-neutral	Policy, programme or situation that has no differential positive or negative impact in terms of gender relations or equality between women and men. When something is applicable or common to both women and men.
Gender parity	Fair balance between individual accountability and incentives. Equal distribution between women and men in every facet of life. Gender parity concerns relative equality in terms of numbers and proportions of women and men, girls and boys, and is often calculated as the ratio of female-to-male values for a given indicator.
Gender roles	Expectations about division of labour between sexes.
Gender specific	Data relevant only to a specific gender group. For example, access to menstrual sanitary products or the prevalence of safe circumcision.
Sex	Sex" refers to the biological differences between males and females, such as the genitalia and genetic differences.

[1] International Labour Office. 2000. *ABC of women worker's rights and gender equality* (p. 48). Geneva: ILO.
[2] EIGE. "What is gender mainstreaming". Available at: https://eige.europa.eu/gender-mainstreaming/what-is-gender-mainstreaming

Structure of the guide

The guide is based on gender good practices in the following:

- ✔ Extractives sector
- ✔ Mining sector
- ✔ Artisanal and small-scale mining (ASM)
- ✔ Mercury management
- ✔ Chemicals management
- ✔ POPs management
- ✔ Policy and strategy formulation

The document provides references and links to various sources and materials including from multilateral and bilateral organisations, academic research, non-governmental organisations (NGOs), private companies, governments and the media (refer to Resources Section).

Table 1 presents the various sections of the guide. The key points are as follows:

- Section A: Background and Context
  The section provides the background and context for incorporating gender dimensions into policy formulation for chemicals management, i.e. mercury in ASGM and POPs. This section provides gender focused facts and figures as well as the key issues that should be considered.

- Section B: Process-oriented recommendations
  The section provides guidance on incorporating gender dimensions throughout the process of National Action Plans and National Implementation Plans development. Accompanying tools, which provide more detailed recommendations, are presented in the Annexes.

- Section C: Content-oriented recommendations
  The section provides guidance on incorporating gender dimensions into the development of content in the NAPs and NIPs. Accompanying tools, which provide more detailed recommendations, are presented in the Annexes

Section A - Background and Context

This section discusses the gendered exposure, the health and socio-economic triggers and impacts on women and men working in chemicals management sectors, with a focus on mercury use in the ASGM sector and on POPs applications.

The sound management of chemicals has important gender dimensions. Men, women, and children are exposed to different kinds of chemicals in varying concentrations. The level of exposure to toxic chemicals and resulting impacts on human health are determined by social as well as biological factors. Social factors such as gender-determined occupational roles expose women and men differently. In agricultural communities in developing countries, men may be at higher risk of direct exposure to chemical pesticides during the application, while women (and sometimes children) may be more likely to be indirectly exposed during planting and harvesting. Women are more frequently exposed to chemicals that occur in products used within the household such as chemicals in cleaning and washing agents and garden insecticides, among others. Women use cosmetics, skin creams, and shampoos more than men and they are affected by the chemicals in these products more than men.

ASGM is the world's largest source of anthropogenic mercury emissions. Gold miners, their families, and downstream communities are highly exposed to metallic mercury and methylmercury. The gold miners suffer occupational intoxication and the global disease burden resulting from this exposure is largely unknown as the informal nature of ASGM restricts the availability of reliable data. Despite the limitations, available data indicates that mercury intoxication in the ASGM sector is a largely neglected global health problem. Based on human biomonitoring data, between 25% and 33% of ASGM miners globally (3.3-6.5 million) suffer from moderate chronic metallic mercury vapor intoxication (CMMVI). The resulting global burden of disease is estimated to range from 1.22 to 2.39 million Disability Adjusted Life Years[3]. Mercury contamination amongst ASGM communities is of major concern and it compromises human health as well as the health of aquatic ecosystems and other biodiversity.

In ASGM, gendered roles in gold processing, buying, and smelting increase the risk of mercury poisoning in men compared to women. However, women are still exposed to significant levels of mercury. In addition to exposing themselves, when women of childbearing age are exposed to mercury there is also a risk of passing it on as methylmercury to their fetuses which can result in congenital defects. Women's exposure to chemicals can cause reproductive health problems such as birth defects, low birth weight, miscarriages, or premature births, and a significant part of the chemical burden experienced by mothers can be passed on to their babies during gestation and breastfeeding[4]. Maternal exposure to mercury has long been known to result in neurodevelopmental problems and neurotoxicity in children[5].

There is an established link between poverty and the increased risk of exposure to toxic and hazardous chemicals. Extended exposure to toxic chemicals in water, food, air, and soil, as well as to chemical products, can cause or exacerbate many serious human health issues. These may include cancer, allergies, and disorders in the reproductive and immune systems as well as in the developmental process. They also constitute a health risk to women, and where it concerns women of childbearing age children may be exposed to high levels through breast milk. These

[3] Steckling N, Tobollik M, Plass D, Hornberg C, Ericson B, Fuller R and Bose-O'Reilly S. 2017. "Global Burden of Disease of Mercury Used in Artisanal Small-Scale Gold Mining". *Annals of Global Health 83(2)*

[4] UNIDO. 2015. "Guide on Gender Mainstreaming UNIDO's Environmental Management Projects". Available at: https://www.unido.org/sites/default/files/2015-02/Gender_Environmental_Management_Projects_0.pdf

[5] https://www.who.int/en/news-room/fact-sheets/detail/mercury-and-health

have a larger impact on women and future generations through them.

POPs are detected in a large number of products that we use in our daily life, they can be used in so many ways across a large spectrum of sectors, and can be found in virtually every corner of the planet. Once released into the environment, these toxic organic chemical substances can remain intact for long periods, and they become widely distributed. A key characteristic of POPs lays in their capacity to bio-accumulate in the fatty tissues of living organisms and to bio-magnify throughout the food chain. Giving their toxic nature, the prolonged exposure of living species over time to POPs can result in a wide range of acute and chronic toxic effects.

While POPs can be found virtually anywhere, not everyone is affected the same way from being exposed to POPs, hence the critical need to decode the differentiated impacts of these harmful substances based on the gendered roles assigned to women, men, children, and other social groups in their daily lives. Whether it's occupational exposure, household exposure, or any other sources of exposure affecting different social groups, it is critical to increase awareness about the differentiated consequences of accidental and chronic exposure to POPs over time.

In general terms, women can be more disproportionately impacted by exposure to POPs as a consequence of gender roles defined by the underlying social and cultural norms. Nevertheless, women can also be part of the solution to detoxify the future as agents of change. The interplay between sex, gender, and exposure to chemicals remains underexplored and often overlooked. Women can be exposed through the life-cycle of products containing POPs, during production (for instance in the textile industry where women make % of textile workers), during use (such as the use of cosmetics and care products containing POPs, despite the growing market for men's cosmetics women are still the major consumers driven by gendered norms), or at the end of a product (example of women informally working as scavengers in e-waste areas).

Because men are perceived to be more fit for manual labor, such as transporting and spraying pesticides or collecting electronic waste, men tend to be most visible at the frontlines, hence attracting further attention and benefiting from training and awareness-raising. In contrast, women's exposure tends to be overlooked, by using gender lenses, the invisible toxic burden on women can be uncovered. Women may not carry or spray pesticides but they tend to be the first ones to enter agricultural fields after pesticides were sprayed and remain there for long hours, they store pesticides in a safe place in the house, wash contaminated clothes, and clean used containers. Women may not travel for long distances to scavenge for and collect e-waste, but they tend to perform the dirtiest and lowest paying tasks such as burning cables.

This gender-based differentiation in roles and impacts, explains why it is crucial to bring-in gender considerations to the forefront of any strategies and action plans for the sound management of chemicals and waste. The first gender-specific decision on gender mainstreaming was adopted in 2017 at the triple COPs of the Basel, Rotterdam, and Stockholm (BRS) Conventions. A dedicated Gender Action Plan (GAP) is being implemented by the BRS Secretariat to ensure that women and men are equally involved and empowered to enable effective and gender-responsive management of chemicals and wastes. At its first meeting, the Conference of the Parties the Minamata Convention agreed to the use of the guidance on the preparation of national action plans[6]. The guidance, developed by the UNEP Global Mercury Partnership, contains a chapter on Gender, Child Labor and ASGM.

The present guidelines on mainstreaming gender into the management of chemicals and waste in general and POPs and mercury in particular, will provide useful insights, extract lessons learned and share good practices towards shaping a new

[6] https://web.unep.org/globalmercurypartnership/nap-guidance-document

generation of gender-smart NIPs and NAPs. Doing so, will also increase awareness within societies and communities, and increase the political buy-in among decision-makers while providing a set of practical tools to support countries in their efforts to mainstream gender considerations into the sound disposal and management of chemicals and waste.

By filling in the gaps to address the root causes and the drivers of gender inequality in the management of chemicals, these guidelines will also contribute to strengthening the crosscutting integration and mutually supportive implementation of several Multilateral Environmental Agreements (MEAs), while at the same time enabling countries to break silos. In fact, chemicals management should not be considered as a standalone intervention but rather integrated into the broader strategic landscape underpinning the implementation of the Sustainable Development Goals (SDGs) in line with national contexts and priorities.

Today more than ever before, the interlinked nature of the SDGs makes it fundamentally important to maximize synergies and additionalities in a context of financial scarcity and volatility threatening to reverse the hardly achieved development gains in the new normal post-COVID-19. Ultimately, a gender-responsive approach to chemicals and wastes management can be part of the solution to end the use of "forever chemicals" and detoxify the future.

Experience shows that when generic gender frameworks and tools are applied to increasingly specialized areas of development practices such as chemicals and waste management, these are usually not fit for purpose and may not capture the unique gender dynamics specific to POPs for instance. These gender guidelines are meant to be a practical tool to enable development practitioners, policymakers, and stakeholders involved in the management of chemicals in general and more specifically in the management, design, and implement the next generation of gender-smart NIPs and NAPs.

Sub-Section A1 Gender and ASGM

ASGM continues to grow around the world, yet the inclusion of women in ASGM initiatives and policy is lagging behind. The early academic literature that informed policy and interventions in ASGM focused on mineral extraction practices, as a result, the contributions of women in mining were historically overlooked because of the non-digging roles that women often occupied in the sector[7]. Today, however, because of an increasing knowledge base on women in artisanal mining, the advent of the Sustainable Development Goals[8], and greater nuance in the field of development, there is increased awareness of the role that women in ASM could play in alleviating poverty and reducing inequality. The disparities that exist in society between male and female rights, responsibilities, access to and control over resources, at the household and community levels, are mirrored in the ASGM sector. Therefore, to realize the full developmental potential of ASGM, addressing these disparities by mainstreaming gender is critical, particularly, given the important role women play in the sector.

The impacts of COVID-19 on ASGM may be increasing gender inequality as an influx of males push women into more marginal and vulnerable roles, increase child labour to provide the income for sick parents, lead to an increase in mercury use, reducing the opportunities to eliminate mercury, yet at the same time increasing its price. Women miners are faced with the choice of foregoing income to stay home and care for their children or bringing their children with them to an active mine site with its risks. Increased poverty and health risks are the outcomes

Element A1.1 Key global figures about women in ASM and ASGM

The wider ASM sector suffers from a lack of reliable statistics. This lack of data on the sector can be attributed to the often informal or illicit nature of ASM operations[9], the transient nature of many ASM miners, and the geographic spread of these often remote operations. Specific subsectors, such as ASGM, also lack data on employment numbers disaggregated by gender and other sector attributes important for building an evidence base for development initiatives[10].

Over the last few decades, attempts have been made to determine the number of miners operating in the ASM sector. One of the most notable attempts at filling this gap is the Delve initiative, which aims to create a database of reliable ASM statistics. The initiative estimates that 41 million people work in ASM globally, of which 30% are women[11]. In the wider ASM sector, women make up less than 10% of the workforce in Asia, between 10%-20% of the workforce in Latin America, and between 40%-50% of the ASM workforce in Africa[12].

With regards to ASGM more specifically, the sector has seen rapid growth over the last 2 decades. In 2001, gold production from the ASGM sector was estimated at 312,000 kilograms[13]. By 2018, this number had more than doubled to 669,400 kilograms[14]. During this period, rising gold prices triggered an ASM gold rush in many parts of the

[7] Hinton, J. 2011. "Gender Differentiated Impacts and Benefits of Artisanal Mining: Engendering Pathways Out of Poverty: A Case Study in Katwe Kabotooro Town Council, Uganda." PhD Dissertation, Vancouver, University of British Columbia.

[8] ASGM is now considered an important part of the Sustainable Development Goals and UNEP details how its work in the sector relates to at least 10 of the SDG's. UNEP. "Artisanal and Small-Scale Gold Mining (ASGM)".

[9] Hayes, K. 2008. "2008 Regional Workshop: Small-scale Mining in Africa - A Case for Sustainable Livelihood". *Commodities Issues Series, November 2008*

[10] The National Statistics Office Survey for ASM in Mongolia done in 2016 is a good example of how to improve data collection and dissemination in the sector.

[11] https://delvedatabase.org/

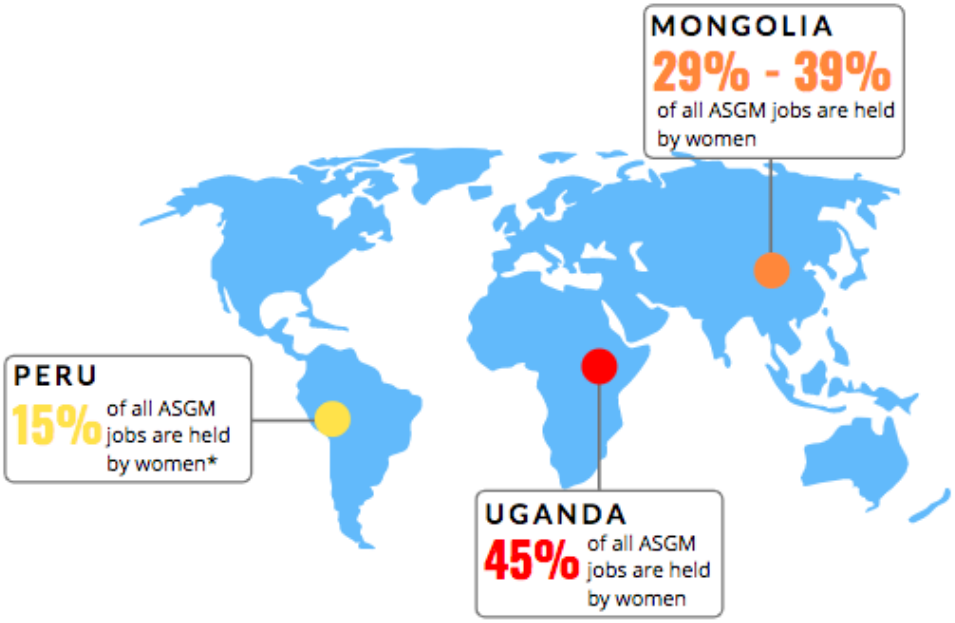
[12] Hinton, J., Veiga, M. and Beinhoff, C. 2003. "Women and artisanal mining: gender roles and the road ahead". In G. Hilson, A.A. Pub, & A. Balkema (Eds.), *The socio-economic impacts of artisanal and small-scale mining in developing countries*. Netherlands: Swets Publishers

[13] Delve Database. Gold. Available at: https://delvedatabase.org/data/minerals/gold

[14] IIED. 2018. "Global Trends in Artisanal and Small-Scale Mining (ASM)"

developing world. As of 2019, an estimated 15 million people work in ASGM globally – including 4.5 million women[15]. The participation of women varies widely between countries as demonstrated below.

Figure 1: Women in ASGM in Selected Countries



Sources: Defensoría del Pueblo. 2014. Balance de la gestión estatal frente a la minería informal e ilegal en el Perú 2012–2014; World Bank. 2019. 2019 State of the Artisanal and Small-Scale Mining Sector. Washington, D.C.: World Bank; PACT, 2018. The Economic Contributions of Artisanal and Small-Scale Mining in Uganda: Gold and Clay; NEMA, 2019. "The National Action Plan for Artisanal and Small-Scale Gold Mining in Uganda" (Draft); *NSO. 2016. Artisanal and Small-scale miners' survey summary. NSO and SDC. 2017. Artisanal and Small-Scale Miners' Survey Report—2016.*

[15] UNEP, 2019. "Towards a mercury-free future in Mongolia and the Philippines".

Figure 2: Select Country ASGM Sector Facts

PERU[16]	UGANDA[17]	MONGOLIA[18]
250,000 artisanal and small-scale miners operate in the country	**31,622** artisanal and small-scale gold miners operate in the country	**40-60,000** artisanal and small-scale gold miners operate in the country
38.7 tonnes of gold are produced annually by the ASGM sector (20%[19] of the national output)	**7 tonnes** of gold are produced annually by the ASGM sector	**7.4 tonnes** of ASGM gold were bought by the Central Bank of Mongolia in 2019 (48% of its purchases)
145 tonnes of mercury emitted from ASGM annually	**15 tonnes** of mercury emitted from ASGM annually	**Mercury is banned** in Mongolia, limiting official statistics, but it is still used in the sector as only 16%[20] of the sector is formalized

Despite women making up 30% of the global ASGM workforce, female ASGM miners consistently find their work undervalued and impeded. For instance, In Peru's ASGM sector, men often only allow women to work as 'Pallaqueras' (gold pickers) that earn on average less than the national minimum wage[21]. Ugandan women working in ASGM have been found to earn as much as 60% less than men for the same work[22]. In Mongolia, women alluvial miners perform all the same activities as men but also carry the additional burden of all domestic work[23].

Women are also saddled with health burdens in ASGM due to the roles they occupy in the value chain. These hazards include exposure to silica-rich dust because they do most of the manual rock crushing. ASGM is the largest source of anthropogenic mercury emissions in the world. Mercury is highly toxic to humans, the environment and animals. Most miners in the sector use mercury to separate gold from ore in a process called amalgamation. The mercury-gold mixture, or amalgam, is then often burned in domestic settings by women, leading to elevated mercury levels in women who participate in ASGM[24]. Inhaling mercury leads to health issues such as neurological damage, harm to the lungs, kidneys and liver.

Women's roles as mothers adds an additional layer of risk. Mercury levels in women of child-bearing age near ASGM activities are often high due to consumption of mercury contaminated fish, handling and inhalation of mercury in gold mining and amalgam processing. Maternal transfer of

[16] PlanetGold. 2019. "Peru". Available at: https://www.planetgold.org/peru
[17] NEMA, 2019. "The National Action Plan for Artisanal and Small-Scale Gold Mining in Uganda" (Draft)
[18] Tsegmid, N and Mijiddor, D. 2020. "MONGOLIA: Impacts of COVID-19 are currently low, but uncertainty in Artisanal Gold Mining Communities remains high".
[19] World Bank. 2019. "2019 State of the Artisanal and Small-Scale Mining Sector". Washington, D.C.
[20] PlanetGold. 2019. "Mongolia". Available at: https://www.planetgold.org/mongolia
[21] Solidaridad. 2018. "Female miners in Peru gain landmark recognition of key role in gold value chain".
[22] NEMA, 2019. op. cit.
[23] Purevjav, B. 2011. "Artisanal and Small-Scale Mining: Gender and Sustainable Livelihoods in Mongolia". In book: *Gendering the Field. Towards Sustainable Livelihoods for Mining Communities*
[24] Bell, L. 2017. "Mercury in Women of Child-bearing Age in 25 Countries".

mercury to the foetus often occurs and results in a high incidence of physical and mental disabilities in the children of ASGM communities[25]. Some studies have shown mercury concentrations of 5 times over the World Health Organisation (WHO) recommended limit in the hair of pregnant and nursing women of indigenous populations that live close to ASGM sites[26].

Women in ASGM are often underpaid, overworked and exposed to some of the worst health risks inherent in the sector. The next section details how this happens in practice by showing how women are discriminated against at all stages of the ASGM value chain.

Element A1.2 Women's and men's roles in the ASGM value chain – reasons and impacts of the differences

"The work inside the mine entrance is for the men...whereas chiselling, breaking, burning, and carting away loads of materials is the work given to women."[27]

- Senides Lucumi, a mineral selector from Suárez, Colombia

Research shows that the roles of women and men in the ASGM value chain are gendered. Women are also well represented in jobs that provide ancillary services to the ASGM value chain, for example: mining goods (including mercury), personal protective equipment, food, grocery shops, sex work etc. Table 2 shows the differences between women and men's roles in the ASGM value chain with brief descriptions of why the differences exist and their impact.

The reasons for the differences in the roles of men and women in the ASGM value chain can be grouped broadly under 3 categories:

1. Socio-economic reasons (i.e. values and perceptions, gendered access to resources and networks),
2. Policy, regulatory and institutional issues (i.e. non-gender responsive policies, ownership of land and mineral rights)
3. Health and environmental concerns (i.e. security, health issues)

[25] Esdaile LJ, Chalker JM. 2018. "The Mercury Problem in Artisanal and Small-Scale Gold Mining". *Chemistry*. 2018; 24(27).

[26] Singh D, Bernard C, Rampersaud P, Laing T, Balraj D, Priester M, Hentschel T, Williams P, Williams A, Davis O and Watson LC. 2013. "Guyana's Extractive Industry Sector (EIS): A Synopsis of Issues and Recommendations for the Mining Sector as a Sustainable Element of Guyana's Low Carbon Development Strategy (LCDS). CI-Guyana, Projekt-Consult GmbH and WWF Guianas, 2013.

[27] ARM, 2017. "Community Stories: Senides Lucumi, mineral selector from Suárez".

Table 2: Roles and Tasks along the ASGM value chain[28]

Prospecting and Exploration

Women Roles	Men Roles	Reasons and Impacts
Few women are involved at this stage	• Finding deposits • Obtaining licenses and exploration permits	**Reasons** • Limited access to financial resources and equipment • Difficulty in attaining ownership of land and mineral rights **Impact** • Marginalisation at this stage has knock-on effects down the rest of the value chain: women have no ownership, women cannot influence work conditions, are poorly compensated and exploited (bonded labour at worst)

Mining / Extraction

Women Roles	Men Roles	Reasons and Impacts
• Work in shallow pits, recent alluvial deposits in riverbeds and banks • Scavenging from waste rock and tailings e.g. 'Pallaqueras[29'30]	• Work in shafts and open pit excavations • Dredging and hydraulicking • Management (equipment, labour & finance) • Installing underground supports • Blasting and rock breaking	**Reasons** • Women are perceived as physically weak and in need of protection • Risk of harassment or assault makes it undesirable and unsafe for many women to participate in roles that require going underground • Superstitions e.g. women going underground makes the gold disappear **Impact** • Women are pushed to more dangerous work of mercury amalgamation • Men are more exposed to underground hazards, such as rock falls, poor ventilation, poor sanitation etc.[31]

Transportation (Ore, waste, water)

Women Roles	Men Roles	Reasons and Impacts
• Manual hauling of water and ore • Providing sacks and buckets for dewatering and ore haulage	• Manual hauling of bags from mine sites (including underground) to processing area • Pit bosses provide equipment for ore transportation	**Reasons** • Women are perceived as physically weak and in need of protection from the most physically taxing work **Impact** • Women are less likely to suffer underground injuries • Higher numbers of injuries and fatalities amongst men

[28] Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development (IGF). (2018). Women in Artisanal and Small-Scale Mining: Challenges and opportunities for greater participation. Winnipeg: IISD.

[29] https://www.solidaridadnetwork.org/news/female-miners-in-peru-gain-landmark-recognition-of-key-role-in-gold-value-chain

[30] In Ecuador they are called 'Jancheras'. Learn more about their work here on the planetGold website.

[31] In Mongolia, men were found to be involved in 2.4 times more accidents than women. See: UNFPA (United Nations Population Fund) and School of public Health. 2007. "Socio-Economic Situation of Artisanal Miners in Mongolia. Ulaanbaatar".

Mineral processing

Women Roles	Men Roles	Reasons and Impacts
• Collecting rocks • Sorting by hand • Manual ore crushing and milling • Panning and sluicing • Re-washing tailings • Amalgamation and burning (if trusted by men)	• Manual crushing with ball mills • Operating processing plant equipment • Amalgamation and burning • Cleaning waste and tailings	Reasons • Women not taught to operate equipment • Women are deemed not physically/ intellectually able enough for all jobs • Lack of trust by men Impact • High mercury exposure for women and their children (the mercury amalgam is also often burned in the home) • Increased risks of musculoskeletal disorders in women exacerbated by manual work

Beneficiation / Value Addition

Women Roles	Men Roles	Reasons and Impacts
• Not common for women	• Refining gold	Reasons • Women are deemed not intellectually able • Usually done by gold buyers, where women have low participation levels Impact • Women are left out of this more valuable work and as a result their earning potential is limited

Mineral Trading

Women Roles	Men Roles	Reasons and Impacts
• Buying and selling gold (usually at the mine site and in a limited way)	• Site and intermediary traders • Financiers (at the mine site, in local towns and cities)	Reasons • Lack of access to finance which limits production power & access to gold Impact • Without the ability to finance operations and increase their trade volume, women are stuck trading at a small scale which prevents accumulation of capital

Element A1.3 Challenges associated with gender inequality in the sector

Much like the gender imbalance present in the value chain, the gender related challenges in the wider ASGM sector can be grouped into four categories: policy, regulatory and institutional challenges, socio-economic challenges, access challenges, and health and safety issues.

Policy, regulatory and institutional challenges

In the countries where ASGM is prevalent, limited gender capacity (the structures and capabilities to translate gender equality issues into policies) within institutions can prevent the creation of the policies and initiatives required to achieve equitable employment opportunities in the sector for both men and women. National ASGM laws and policies often do not address the economic and social conditions that force women into the mines in the first placesuch as conditions for women in farming, including land ownership and access to resources. Gender equality is a cross-

cutting theme, requiring that countries build up the technical capacity of multiple institutions, not solely those built to address women's affairs.

Institutional bias in the ASGM context manifests itself in issues such as difficulty in securing loans or land tenure rights for women. For instance, in Tanzania, women must have the permission of their husband to secure a loan[32]. Even in countries such as Zimbabwe, where women can legally obtain land and mineral rights, female miners find it difficult to secure mining rights due to a combination of onerous requirements, prejudice, customary laws and a lack of knowledge of their own rights[33]. This impedes them from becoming formal owners of their own operations, leaves them outside of formal structures and the difficulty of the licensing requirements themselves can legitimize pre-existing control of sites by men[34]. Leaving women without clear routes to ownership whilst engaging in a formalisation process risks reinforcing exclusionary dynamics in the sector where, for instance, ASGM cooperatives are formed yet women have little decision-making power and cannot voice their concerns or have them attended to.

The inertia of history also often works against women in ASGM. There is a lack of appreciation of how the involvement of women in mining has evolved over centuries and how today's norms were created. For example, Lahiri-Dutt[35] describes how colonization changed resource governance and upset the pre-colonization understanding of mining as a livelihood (in which women may have probably freely participated as part of a family structure), to a formal labour structure in which the requirements for mining licenses excluded women altogether.

Lastly, when institutions fail to resolve or intervene peacefully, conflict and corruption surrounding ASGM disproportionately impacts women through violence and decreasing the already limited opportunities they have for education and income as these opportunities require stability[36].

Socio-economic challenges

> *The only place where women were not represented was inside the mine shafts themselves, a domain reserved by unwritten custom exclusively for men".*[37]

Gender norms, beliefs and values embedded in a society can cause significant harm to female miners[38]. Beliefs that women are not physically or intellectually able enough to participate in all areas of the mining value chain are often the result of a lack of education and cultural norms that encourage these beliefs. Superstitions such as 'allowing women underground will make the gold disappear' and unwritten customs amongst miners are used to perpetuate the power imbalance and push women to operate in areas of work with less remuneration and status.

Once pushed to these lower value activities, the contributions of women are often undervalued. Typically, the ore extraction

[32] Lahiri-Dutt, K. 2004. "Women and ASM—Issues and Priorities," Presentation at 4th Communities and Small-Scale Mining (CASM) Annual General Meeting, Colombo, Sri Lanka. October 12–16, 2004.

[33] Hilson, G. (2002). Small-scale mining and its socio-economic impact in developing countries. Natural Resources Forum 26(1), 3-13.

[34] Buss D, Rutherford N, Stewart J, Côté G, Sebina-Zziwa A, Kibombo R, Hinton J and Lebert J. 2019. "Gender and artisanal and small-scale mining: implications for formalization". *The Extractive Industries and Society. Volume 6, Issue 4, 2019*

[35] Lahiri-Dutt, K. 2008. Digging to Survive: Women's Livelihoods in South Asia's Small Mines and Quarries. *South Asian Survey, 15(2),* 217–244.

[36] Global Witness. 2017. "Sharing the spoils: Gender and the mining industry".

[37] IDRC, 2017. "Golden girls: The hidden role of women in Africa's artisanal mines".

[38] Nsanzimana, B, Nkundibiza, P, & Mwambarangwe, P. 2020. Promoting gender equality in the Rwandan ASM: efforts and obstacles, Canadian Journal of African Studies / Revue canadienne des études africaines, 54:1, 119-138, DOI: 10.1080/00083968.2019.1671884

work is primarily done by men and this is viewed as the "real mining"[39]. As a result, women's contributions in processing and support services are undervalued and poorly remunerated despite it being integral to the operation. Simultaneously, the time and effort to fully participate in these lower value areas is further constrained by the disproportionate domestic responsibilities that women have. This further limits their ability to make meaningful financial progress[40].

Female ASGM miners are often the primary caregivers to their children, and this can have tragic consequences. An estimated 600,000 children work in ASGM and they are often first introduced to mining when they accompany a parent to the mine site[41]. Children can be involved in numerous areas of the value chain which is dangerous as their still developing bodies are particularly vulnerable to the negative consequences of exposure to dust and chemicals (such as mercury). Girls at mine sites are vulnerable to early pregnancy, sexual exploitation and risk contracting sexually transmitted diseases (STD).

One particularly important socio-economic challenge involves Accessing assets and opportunities. This can be difficult for most ASGM miners, but the challenges are even more pronounced for women. Education continues to be a barrier in ASGM settings where the low literacy rates of women directly impact their ability to access opportunities and take on training and skills acquisition, further limiting their opportunities within the sector[42].

Even for those women with the required literacy and skills, accessing these services is difficult due to the limited consideration for the constraint's women face when attempting to obtain financing, attend training and obtain licenses. These constraints include some of the socio-economic issues outlined earlier and issues such as securing childcare for their dependents whilst they pursue these opportunities. Furthermore, often too few women focused mining associations exist which makes it difficult for female miners to pool their resources, coordinate their efforts and structure their work in a manner that suits their circumstances.

Health and Safety challenges

> *"There were no toilets, no healthcare, and no services. Sanitation was a big problem. And we were always scared of being raped or robbed," said Nakacho, who is too afraid to climb the hill to her mine shaft alone after dark. "These things happened to some of my friends."*[43]
>
> *- Mariam Nakacho, ASGM Miner in Uganda*

Women in ASGM are more vulnerable than men to disease and violence. Women are often at higher risk of exposure to mercury due to their roles in the ASGM value chain where, for instance, they spend long periods of time burning mercury amalgam – sometimes even in their homes[44]. They also suffer physical strain and exposure to disease as they spend hours in water when panning for gold.

In the remote areas that ASGM operates, there is often little recourse for the victims of gender-based violence (GBV). There is evidence of sexual violence, transactional sex and women being victims of sexual

[39] Lahiri-Dutt, K. 2012. Digging women: Towards a new agenda for feminist critiques of mining. Gender, Place & Culture, 19(2), 193–212.

[40] Oduro, A., & van Staveren, I. (2015). Engendering economic policy in Africa. Feminist Economics, 21(3), 1–22.

[41] PACT, 2015. op. cit.

[42] Global Witness. 2017. "Sharing the spoils: Gender and the mining industry".

[43] IDRC, 2017 op. cit.

[44] Heemskerk, M. 2013. "Gender Assessment of Small-scale Mining in Mongolia".

exploitation, sexually transmitted diseases and undertaking dangerous abortions[45,46].

Element A1.4 Opportunities and importance of gender mainstreaming for sector development

Overcoming the barriers to mainstreaming gender into ASM is possible using a variety of approaches and these are grouped into: 1) enabling collective action, 2) providing services and resources and lastly, 3) design and implementation of interventions with a gender perspective.

Enabling Collective Action

> *"We have to be united. We always think about doing things for ourselves, but if we work like that we won't get anywhere. We have to join forces and work in partnership."*
> *- Senides Lucumi, a Mineral selector from Suárez, Colombia*

Collective action is a theme presented throughout the literature as a path towards overcoming some of the challenges women face in ASGM. This can take several forms: female mining cooperatives, savings clubs and women only miners associations[47,48].

Solidaridad documented the importance of female mining cooperatives in Bolivia as a tool for putting women on equal footing. As one participant of a workshop noted, being part of a cooperative is not enough because the gender imbalances will persist within the organisation if it is not female led[49].

> *"Men have always discriminated against us. They have undermined our rights by not allowing us in their governance bodies and stripping our meagre income from us for being women"*
> *- Carmen Pinola from the San José de Oruro Cooperative.*

The above referenced workshop was an opportunity for women miners to congregate and have their voices heard. It is at such meetings that women have a safe environment to begin organising. Another example of this is Sharefair, an inspiring platform to help women share knowledge and develop solutions[50].

Women can also coordinate to share financial resources in the form of savings clubs. An excellent example of this is being facilitated in Africa by Autonomisation des femmes par l'épargne et le credit communautaire responsable (AFECCOR)[51], which helps establish village savings and loans associations with a focus on galvanizing the financial resources women miners need to attain economic empowerment[52].

Providing Services and Resources

Women in ASGM lack more than just individual financial resources. Providing community level resources is also important and can be an effective tool to bridge the gender divide in ASGM. For some of the required services, institutions are also required.

For instance, the creation and provision of financial products specifically for female ASGM miners could make a tremendous difference to addressing the gender gap.

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[45] Ibid.

[46] Gender Resource Facility. 2016. "The Gender Dimensions of Tin, Tantalum and Tungsten Mining in the Great Lakes Region".

[47] Women in Mining Tanzania. 2014. "TAWOMA: Supporting the Disadvantaged in Tanzania Mining Communities".

[48] Mpagi I, Ssamula N, Ongode B, Henderson S, and Robinah, H. 2017. "Artisanal gold mining: both a woman's and a man's world. A Uganda case study". *Gender & Development. 25. 471-487*

[49] Solidaridad. 2018. "Women miners in Bolivia outline challenges for gender equity".

[50] UN Women. 2016. "Promoting-Women's-Participation-in-Extractive-Industries".

[51] AFFECOR – English translation is "Artisanal mining women's empowerment credit and savings project"

[52] IMPACT, 2019. "Artisanal Mining Women's Empowerment Credit & Savings (AFECCOR)".

Financial products specifically for ASGM participants are being created and trialled in countries like Ecuador and tailoring similar products specifically for women miners is a natural next step[53].

When it comes to the health of women miners, in Papua New Guinea (PNG) the government has allocated resources to support health improvements of the ASM sector and women were included as beneficiaries. However, the structure of the interventions could be improved to respond to the specific needs of women, for example women indicated that they preferred shorter and more flexible training programs[54].

Lastly, catering to the specific needs of women on mining sites by improving access to antenatal and postnatal care for women working in often isolated ASM areas would also greatly assist women's health and ability to work safely.

Design and Implementation of Interventions and Policies with a Gender Perspective

From a national policy perspective, some success has been found by setting targets for the desired number of women in mining. This was done in Rwanda and South Africa's large-scale mining (LSM) sector has similarly been nudged to improve the representation of women in the sector, for example, by legislating that mining rights holders can purchase mining goods from majority women owned companies to fulfil their local content requirements[55].

One of the approaches to mainstreaming gender into ASGM project implementation plans is educating men and women on the benefits of equality. The NGO Pact found that arguing for gender equality as a human right had little impact on the behaviour of miners. However, highlighting the socio-economic benefits of rejecting gender stereotypes and myths made men and women more likely to accept gender equality[56]. Similarly, Solidaridad has also seen some success by hosting gender sensitization workshops for miners to promote gender inclusive policies within the mines themselves[57].

Technology is another lever for consideration. For instance, the use of technology to increase safety is being trialled by the Guyana Women Miners Organization (GWMO) using apps and drones[58]. Biometric registration is being piloted in Uganda and is already being implemented in Colombia as part of traceability efforts funded by the Better Gold Initiative. Increasing the safety of women at mine sites using technology could be one tool to making women equal members of their ASM communities. And women should be involved in the introduction of new technology that reduces or removes the use of mercury completely.

Other suggestions for improving the safety of women have come from organisations like the Asia Foundation, which recommended that alcohol be banned from mine sites (as in some cases it reduced reported GBV) and efforts should be made to facilitate the registration of migrant miners to increase accountability[59].

Another opportunity to instil gender mainstreaming is by leveraging the work being done in supply chains. Some of the

[53] The National Program for the Environmental Sound Management and Life-Cycle Management of Chemical Substances. 2019. "PRODUCT 3. Proposal for existing products that are viable to be strengthened and/or a new financial product for the ASGM sector".

[54] Lynas, D. 2018. "A good business or a risky business: Health, safety and quality of life for women small-scale miners in PNG". *Chapter in: Between the Plough and the Pick Informal, ASM in the Contemporary World*.

[55] Department of Mineral Resources. 2018. "Implementation guidelines for Mining Charter, 2018". South Africa Government Gazette. December 2018.

[56] PACT. 2019. "Training handbook for artisanal and small-scale miners in Zimbabwe"

[57] Solidaridad. 2018. "Improve the economic & social position of women in gold mines".

[58] Kaieteur News Online. 2019. "Women's Organization on mission to halt illegal mining activities".

[59] Heemskerk op. cit.

mineral certification standards and due diligence guidelines have included a gender equality component into their work[60]. Getting the miners to see the benefits of equality through the increased value of their certified output could also yield positive results.

Conclusion

This section has provided a high-level description of the challenges women face in the ASGM sector and some of the levers available that can assist in the mainstreaming of gender into ASGM. It is only through committing to this mainstreaming process and applying the requisite resources that ASGM can reach its full developmental potential.

[60] Women's Rights and Mining. 2019. "Stakeholder Statement on Implementing Gender-Responsive Due Diligence and ensuring the human rights of women in Mineral Supply Chains".

Sub-Section A2 - A Gender Context in the management of POPs

In this Sub-Section, we provide useful context and highlight the importance of gender mainstreaming into the management of POPs. By setting the scene for the design and implementation of a new generation of gender-smart NIPs, we also emphasize the mutual supportiveness between Multilateral Environmental Agreements (MEAs) to facilitate a global transition to greener economies using gender-responsive and POPs-free sustainable development strategies, while harnessing gender-sensitive alternatives towards a detoxified future. Furthermore, we provide an overview of the trends, global figures, and explore the gender roles assigned to women, men, and social groups most at risk and discuss the interplay between sex, gender, and exposure to POPs to showcase the different ways in which their impacts are unevenly distributed leading or exacerbating the social, economic, and health inequalities. We also discuss the challenges associated with gender inequality in the governance schemes related to POPs management and explore current and future opportunities for gender mainstreaming throughout the NIP process. The insights provided here should not be translated into standalone interventions but rather as an integral part of holistic and broader sustainable development strategies that could yield wider development co-benefits in contribution to the SDGs.

A bird's eye view of literature data, case studies, and voices of women and men at the frontlines shows that overall and despite the noticeable progress achieved over the last two decades since the adoption of the Stockholm Convention, gender considerations in the context of POPs management remain largely understudied and underrecognized. Today more than ever before, as countries are joining forces in the spirit of multilateralism to build back more resilient economies in the aftermath of Covid-19, there is a critical need to identify the often-invisible linkages between gender inequalities, poverty, and the increased risks associated with exposure to POPs, together with a good understanding of poverty as a social phenomenon from a gender perspective. Such linkages should not be overlooked while designing strategies and action plans for the sound management of POPs.

By applying gender lenses to unpack the multifaceted impacts of POPs on human health and the environment, it becomes clear that women and men are not affected the same way, that the socio-economic and health burden associated with exposure to POPs can shift based on gendered norms, stereotypes, perceptions and the social roles assigned to both women and men within a given social context.

Element A2.1 Trends & Key Global Figures

According to estimates, the global chemicals industry exceeded USD 5 trillion in 2017 and is expected to double by 2030 driven by the growth in chemical-intensive industries such as agriculture and electronics (UNEP, 2019). Every year, about 8.9 million deaths worldwide are attributed to pollution, out of which 94% occur in the least and middle-income countries (Suk, et al., 2016). Contrary to the perceptions, toxic pollution is not a standalone threat, but essentially a development concern at the intersection of health and the environment, potentially leading to disease and mortality. The resulting economic costs can derail nations from their development pathways especially in developing countries, with small islands developing states and least developing countries facing the greatest challenges.

In 2004, a total of 4.9 million deaths and 86 million disability-adjusted life years were attributed to the exposure and

management of harmful chemicals (Prüss-Ustün, Vickers, Haefliger, & Bertollini, 2011). In 2016, about 1.6 million lives and another 45 million disability-adjusted life years were lost due to the exposure to chemicals. In sub-Saharan Africa alone, health costs related to exposure to pesticides translates into an economic burden of approximately USD 90 billion (SAICM, 2020). In Serbia, a recent estimate of the costs associated with treating diseases assumed to be associated with exposure to POPs over 5 years suggested an approximate figure of € 68 million (Milic, et al., 2019).

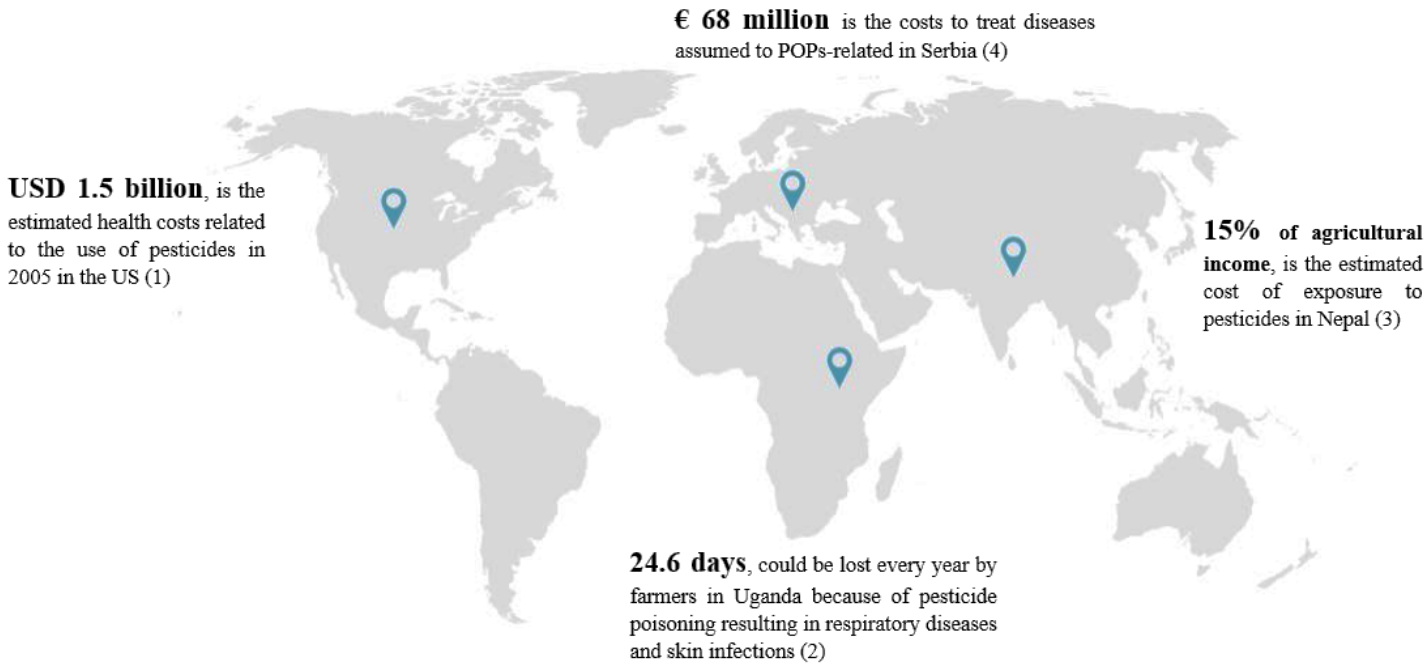
POPs can be found virtually anywhere, in the food we eat, in the air we breathe, and in a wide range of products that we use in everyday life at home, in the workplace, and outdoors. Because of their ability to bio-magnify, organisms at the top of the food chain are the ones most likely to bio-accumulate higher concentrations of POPs and are thus the most exposed. POPs can be directly introduced to the environment, released with emissions as by-productions of combustion or other industrial processes, contained in products as impurity use, or re-emitted from polluted substrates including contaminated waters, soils, waste, sewage, and other products (Kakareka, 2020).

Pesticide POPs, for instance, are mainly used as agrochemicals for pest control in the agricultural sector. They are released during different stages of the value chain from production, to transport and during their application, but most importantly during storage giving the lack of secure facilities and deteriorating packages, and in burial sites where obsolete stockpiles of pesticides can be found at the end of their life-cycle (Kakareka, 2020). While we know more about emission processes and patterns for pesticides, there is relatively limited knowledge with regards to non-pesticide POPs (Breivik, et al., 2004). PCBs are mostly found in dielectric transformers and capacitors and can be released through leakages and evaporation, other POPs such as dioxins, furans, polycyclic aromatic hydrocarbons, and hexachlorobenzene are re-released into the air as by-products of various combustions and industrial processes such as fuel combustion, forest fires, waste incineration, paper bleaching, landfills, wood preservation, and aluminum production to mention only a few examples (Kakareka, 2020).

In terms of exposure, some POPs are most frequently encountered, for instance, pesticide POPs such as DDT, industrial POPs such as PCBs, and unintentional POPs such as Dioxins which are by-products resulting from several industrial processes (WHO, 2020). Exposure to POPs, even at low levels, can have adverse consequences on human health including reproductive disorders, gene mutations leading to higher risks of cancer, misfunctioning of the immune system, neurobehavioral complications, endocrine disruption, and congenital disorders (WHO, 2020). Recent investigations have also underscored the mounting evidence associating exposure to POPs with metabolic disorders such as type 2 diabetes and obesity while highlighting the need for thorough risk assessment and adequate regulations (Ruzzin, 2012).

According to the European Environmental Agency, its 33 member countries reported decreasing emission levels of POPs between 1990 and 2017, reaching an estimated reduction of 95% for HCB, 83% for PAHs, 75% for PCBs, and 70% for dioxins and furans. The major emission sources in 2017 were reported within two main sectors namely "Commercial, institutional and households" as well as "Industrial processes and product use" (EEA, 2019).

Figure 2. The invisible costs of the "silent killers"



Sources: (1) Health costs related to the use of pesticides in 2005 in the US could further increase to USD 15 billion when taking into account fatal outcomes resulting from chronic exposure (Bourguet & Guillemaud, 2016). (2) In Uganda, the monetary costs of inaction in managing new POPs were estimated to increase from USD17.5 million to USD27.1 million over five years, while the cost of action amounted to an estimated USD 10.13 million over the same 5-year duration (NEMA, 2016). (3) In Nepal, the highest burden of pesticides use falls on the poorer (Atreya, Sitaula, & Bajracharya, 2002). (4) In Serbia, a recent estimate of the costs associated with treating diseases assumed to be associated with exposure to POPs over a 5-year period suggested an approximate figure of € 68 million (Milic, et al., 2019).

While we recognize the bio-magnifying and persistent nature of POPs and acknowledge the mounting scientific evidence pointing to their probable adverse impacts on human health and the environment, we also need to walk the extra mile to understand their gendered impacts. Indeed, POPs are often pointed in the causal pathways associated with a wide range of health issues, affecting the human population from pole to pole, irrespective of gender, age, ethnicity, religion, culture, or socioeconomic status. Nevertheless, environmental health research was reportedly biased given the focus of exposure studies on men, occupational workers, as well as male rodents in animal research models (Wahlang, 2018). In animal research models, female subjects remain underrepresented (Beery, 2018), as data from experiments conducted on animals are expected to mimic or predict the human experience, hence the need to design meaningful models to detect gender-based differences (Curry, 2001).

By looking into the current state of research on environmental health, one can notice the missing linkages to gender considerations and the need to mainstream gender into this critical field of research. Out of 552 studies examining social inequalities in environmental health, sex, and gender concepts were only mentioned in 45 abstracts and further analyzed in 11 studies (Paeck & Bolte, 2016). The explanatory approaches used and the effect modifiers considered in the risk models were mostly focused on the biological dimension, this underscores the existing gap in addressing gender considerations. The validity and utility of research findings would be even greater if not only biological but also gender considerations are systematically integrated into the research frameworks and protocols applied in the field of environmental health (Paeck & Bolte, 2016).

This highlights the need to address research limitations in environmental health studies to uncover the gender differences behind the main narrative of POPs affecting everyone. Nevertheless, this is not only the work of medical practitioners and scientists, we can only achieve better results by bringing together practitioners from the fields of biomedical and public health research, but also gender specialists. Experts need to work in cross-functional teams, talk to each other and maintain a two-way dialogue to experiment with various innovations to build gender-smart methodologies and establish novel approaches to data collections and data analysis (Bolte, et al., 2018). By decoding the mainstream narrative behind the exposure to POPs, we can make the case and shed the lights on the gender-differentiated impacts resulting from the exposure of women and men to these "silent-killers" (M.L. Alharbi, Basheer, A. Khattab, & Ali, 2018).

Element A2.2 Gendered roles, social determinants, and impacts in the context of POPs

To understand the gender-differentiated impact of POPs, we need first to understand the emission pathways of these chemicals and how women and men are exposed based on the differentiated gender roles assigned to them along with specific sectors, industries, and value chains.

Pesticide POPs

The rising demand for pesticides driven by the proliferation of pests due to various factors such as unsustainable agricultural practices and climate change, combined with the existing gender inequalities in terms of power relations, education, and livelihoods, exacerbates gender-differentiated vulnerabilities to POPs. In developing countries, there is a knowledge gap in understanding the gendered impacts associated with exposure to POPs, with data indicating that women's exposure to pesticides, as well as cases of women poisoning and injuries potentially linked to

pesticides, remain largely underestimated (London, et al., 2002).

A study in Nepal showed that "75% of females and 47% of males could not read and understand the icon of pesticides labels present in containers. Furthermore, 64% of females and 38% of males were not aware of the pesticide labels". (Atreya, Pesticide use knowledge and practices: A gender differences in Nepal, 2007)

In Tanzania's horticulture industry, while both women and men workers can be exposed to pesticides, women tend to be affected the most. This could be due to insufficient knowledge about the harmful effects of agrochemicals, as well as other factors such as poor hygiene, inadequate washing facilities, and the non-respect of the necessary precautions indicated on pesticide labels (Jonathan, Aiwerasia, Ngowi, Kishinhi, & Mamuya, 2017). This gender gap could be explained by the underlying gender dynamics based on several social determinants including relatively low levels of access to education among women, low income, and weak participation in decision making even with regards to the decision related to their health.

In Ethiopia "Formal training was (also) more common among applicators (27%) than among re-entry workers (5%). If we stratify the re-entry workers by gender, none of the 275 females (interviewed) was trained on pesticide hazards"..."Training should be given not only to pesticide applicators but also to re-entry workers particularly female once" (Negatu, Hans, Mekonnen, & Vermeulen, 2016)

Furthermore, according to studies and observations in Tanzania and Kenya, even though women usually do not spray pesticides, they were reportedly working in fields where pesticides were being sprayed or access such fields right after spraying, often working for long hours which increases their likelihood to be exposed. Women were also found to be exposed during pruning, grading, and cleaning of flowers. Symptoms potentially associated with exposure to pesticides were mostly reported by women involved in weeding, planting, and harvesting (Jonathan, Aiwerasia, Ngowi, Kishinhi, & Mamuya, 2017).

"The markets where pesticides are purchased are often several kilometers from the village, and there are key gender differences in the way that pesticides are transported from the market to the home or field. In Ghana and Mali, female participants illustrated women carrying pesticides from the store to their field on their heads, while men drew trucks, cars, or bicycles. Observation revealed that men had access to bicycles and motorcycles, which they take to their fields, while women primarily walk" (Christie, Van Houweling, & Zseleczky, 2015)

In addition to their domestic duties, women may find themselves obliged to provide for their families, such social and economic pressures may drive risk-prone behaviors. Moreover, women tend to have a low perception of the risks associated with the use of pesticides because of poor access to information, they also tend to store pesticides in places over which they have more control such as the kitchen or the bedroom, thus further exposing themselves (Jonathan, Aiwerasia, Ngowi, Kishinhi, & Mamuya, 2017).

Nearly all men in Mali stored their chemicals in the field (85 %) or storage space (9 %), while only 39 % of women stored chemicals in the field, 32 % in storage space, 21 % in the attic (or rafters), and 8 % in the kitchen. (Christie, Van Houweling, & Zseleczky, 2015)

This is a potential blind-spot in POPs-centric policies and interventions, because women may not be considered as pesticide users, they may not fully benefit from preventive measures, hazards warnings, training on pesticide management, and other awareness-raising interventions meant to prevent the harmful effects of agrochemicals (Jonathan, Aiwerasia, Ngowi, Kishinhi, & Mamuya, 2017). In other terms, the false assumption that men are the ones using pesticides feeds into the misleading risk perception. This is an aggravating factor increasing women's vulnerabilities and exposing them to yet greater risks compared to men working in the agricultural sector (London, et al., 2002).

"Women are often not invited to participate in training about the safe use and handling of pesticides organized by extension workers, who are often men. As a result, women are exposed to the negative effects of pesticides because they frequently do not know about the toxicity levels of the different chemicals being used and their impacts on health as well as the environment" (Kawarazuka, et al., 2020)

"*Previously we were spraying DDT and Malathion into our cotton crops, the men were carrying the pesticides on their backs and the women were mixing it and handing it over. Spraying pesticides had caused dangerous internal health problems to the men. Also, we are spraying the field with pesticides that flow into the river and the animals then drink this contaminated water. It caused health problems to the children as well as the farmers."*

Wudinesh Koricho, a female organic cotton farmer
Shelle Mella, Ethiopia (Pesticide Action Network UK, 2018)

Despite significant health costs of pesticide use, farmers continue using harmful chemicals. Farmers could be locked-in and entrapped in the prevailing agricultural system based on pest control technology (Wilson & Tisdell, 2000). A study from Nepal showed that while the cost of exposure to pesticides represents 15% of agricultural income, poorer households incurred the highest-burden of pesticide use (Atreya, Sitaula, & Bajracharya, Distribution of health costs of pesticide use by household economy, 2002). Household surveys showed that farmworkers may underestimate the harmful health effects resulting from exposure to pesticides (Atreya, Health costs from short-term exposure to pesticides in Nepal, 2008). Another study from Pakistan showed that farmers who previously experienced pesticide poisoning are more motivated to pay extra for integrated pest management practices that reduce reliance on pesticides. Their motivation to pay depends on other factors including levels of education, income, and perception of risk (Khan, 2009). A review of 61 papers which were published between 1980 and 2014 as well as independent datasets, estimated that health costs related to the use of pesticides in 2005 in the US amounted to USD 1.5 billion and could further increase to USD 15 billion when taking into account fatal outcomes resulting from chronic exposure (Bourguet & Guillemaud, 2016).

While many POPs pesticides may affect women and men the same way, there is a need for gender-sensitive research to further investigate maternal exposure to specific pesticides to assess their potential association with many adverse outcomes such as those related to abortion, fetal death, and congenital defects including where previous studies were not conclusive (García, 2003).

This is the case for instance of DDT. A study in Taiwan based on 9 birth cohorts in 349 townships suggests that exposure to DDT used for malaria control during early childhood could increase the risk of breast cancer in adulthood (Chang, El-Zaemey, Heyworth, & Tang, 2018). Another study in California, suggests that maternal exposure

to DDT while their daughters were in the womb, increased 4 times the likelihood for their daughters to be diagnosed with breast cancer during adulthood (Cohn, et al., 2015). In South Africa, mothers who lived in households sprayed with DDT for malaria control were found to have 5 to 7 times higher serum concentrations of DDT and DDE (Gaspar, et al., 2017)

"(These) results suggest that gender-sensitive educational programs should be implemented to increase the awareness of safety amongst farmers, and protective measures should be encouraged to reduce exposure to pesticide risks in China". (Wang, Jin, He, & Gong, 2017)

Table 3. Examples of gender roles related to the use of pesticides

	Women	Men
Roles	• Women are more likely to control the production and output of the subsistence. • When living alone women are the main applicators of pesticides. • Women transporting pesticides are more likely to carry pesticides on their heads in baskets. • Women fetch the water to be used for mixing the pesticides.[61] • Women clean men's pesticides contaminated clothes after application. • Women sometimes clean and reuse the mixing of buckets and drums for fetching and storing water. • Women are equally responsible for daily activities in the land after pesticide use. • Mothers and children tend to spend relatively more time in the households sprayed, often more than once over time, with DDT for malaria control.	• Men have more decision-making power over the production and output of the household's cash crops. • Men are considered the main applicator of pesticides. • Men are more likely to transfer pesticides using some type of vehicle (truck, car, motorcycle, bicycles, etc). • Men tend to reuse the mixing of buckets and drums for other activities around the land, maintaining and storing spare equipment. • Men are equally responsible for daily activities in the land after pesticide use.
Reason	• Pesticide application is not considered a women's job. • Women are not taught to operate vehicles, are not encouraged to get driving licenses besides the stigma related to the use of certain transportation (e.g., in some contexts there is a belief	• Pesticide spraying is considered a man's job. • Perceived invulnerable masculinity puts men in charge of riskier activities.

[61] https://www.frontiersin.org/articles/10.3389/fagro.2020.00007/full

	that a girl can lose her virginity by riding a bike). • Pesticide application is not considered a woman's responsibility. • Washing clothes is perceived as women's work. • Securing water for the household is considered a woman's job.	
Impact	• Not considered a primary user of pesticides, women could have limited access to pesticide training. • Women are exposed to higher risk during the transportation of pesticides. • Women are exposed to the negative effects of pesticides because they frequently do not know about the toxicity levels of the different chemicals being used and their impacts on health as well as the environment. • If women were more aware of the hazards, they could influence their husbands to adopt safer practices around pesticide application.	• Men are more likely to receive training about the safe use of pesticides. Because of the training they receive: • Men are more likely to have access/ wear protective gear during spraying. • Men are more likely to wash their hands and take a bath after spraying pesticides. • Men are more likely to change their clothes after spraying pesticides

Industrial POPs: E-waste

While efforts were made to address exposure to POPs such as phthalates found in toys and other childcare articles, further attention needs to be given to other exposure routes such as through electronics and electrical equipment (Greenpeace, 2008). Inadequately managed Waste Electrical and Electronic Equipment (WEEE), or e-waste, can pose serious threats to the environment and human health, hence the role of e-waste statistics to understand the full picture. Out of 53.6 million metric tons generated in 2019, less than 18% was properly documented and recycled according to official figures (Forti, Baldé, Kueh, & Bel, 2020). In China's Guiyu, where 70% of the world's e-waste ends up, only 25% is recycled in formal centers (Li & Achal, 2020). Available data suggest that exposure to POPs could be associated with local e-waste recycling activities (Wu, Yang, Song, Gao, & Huang, 2016). For example, in the case of recycled products containing polybrominated diphenyl ethers (POP-PBDEs), mostly found in the plastic of certain electrical and electronic equipment, it is a challenge for developing countries to effectively manage these POPs due to insufficient monitoring and dismantling capacities as well as the prevailing practices of open burning and dumping of hazardous wastes (Sindiku, et al., 2012).

Estimates suggest that the global electronics industry employed about 18 million women and men in 2010 (ILO, 2019). Most of the workers in the solid waste management and recycling industry are informal waste pickers in developing countries, a large share of which are presumably women, with only 4 million being formally employed out of the 19 to 24

million estimated workers in this sector (ILO, 2013). The processing of e-waste became a source of income for many families living below the poverty line in developing countries. Products at the end of their lifecycle are dismantled and manually sorted into fractions, with children and women routinely involved in this process (Ghosh, Baidya, Debnath, & Biswa, 2014). Despite the lack of substantive engendered data, women and children tend to be at the lower end of the recycling economy doing the lowest-paid and dirtiest jobs. Furthermore, women can be paid less while performing the same tasks as men (Lines, Garside, Sinha, & Fedorenko, 2016), making them more likely to be exposed to the hazards and adverse health effects associated with e-waste.

In Lagos Nigeria "about 30% of the most laborious jobs of e-waste scavenging are done by women, with a large share done by children" (WECF, 2017)

Landfill pickers report that women can earn around MNT 10,000 per day (US$ 4) and men around MNT30,000 per day (US$ 12). (UNEP, 2019)

"Although little e-waste literature in China or India takes a gendered perspective, evidence from broader studies of informality show that women are more likely to work in lower-paid, more hazardous activities associated with e-waste dismantling and recycling, or be paid less for the same work as men" (Lines, Garside, Sinha, & Fedorenko, 2016)

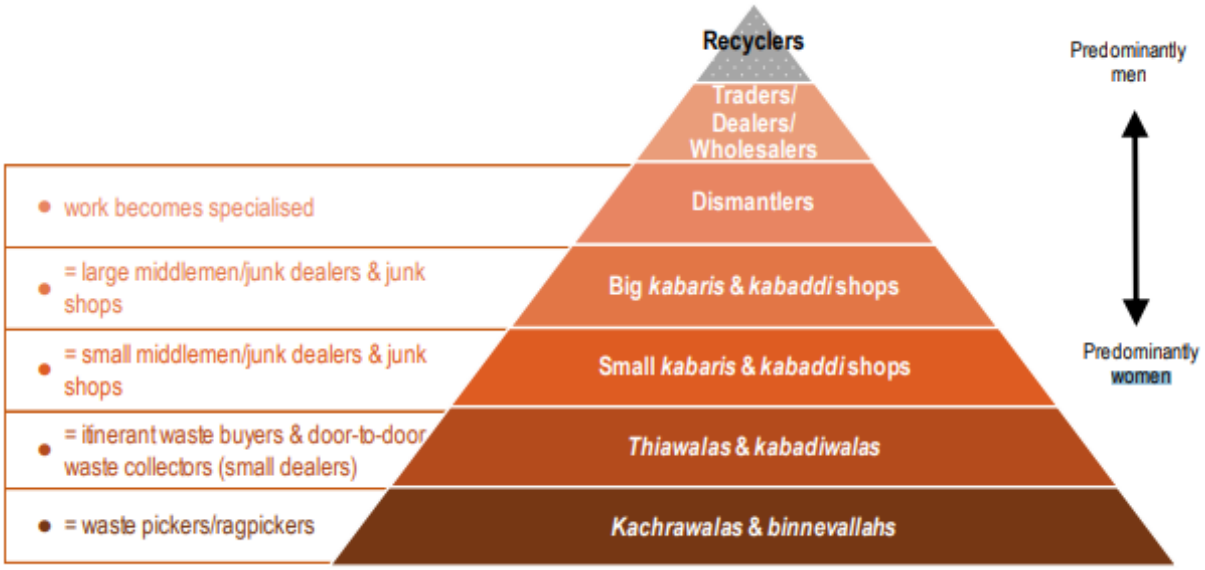
From a gender perspective, e-waste can be seen as a problem of recognition giving a poor understanding of the working conditions of the poorest workers. While women can benefit from flexible working hours in e-waste sites to care for their families and still earn some income, they often find themselves disproportionately exposed to the triple burden of mortality, fertility, and intergenerational health complications reaching future generations (McAllister, Magee, & Hale, 2014). Along the e-waste value chain, women, similar to other vulnerable social categories such as immigrants, Roma, jobless people and those with specific needs, children and elderly, tend to be socially and economically marginalized, exposing themselves to hazardous waste and putting their health at greater risks (ILO, 2014).

"Flexible hours can make waste (including e-waste) inclusive of women who have other care responsibilities and/or when cultural or others factors constrain them to income-generating activities in or near the home" (Lines, Garside, Sinha, & Fedorenko, 2016)

In La Paz Bolivia "there are approximately 330 people working independently, either as individuals or in family groups; 10 percent of them are engaged in collecting e-waste. Generally, its members/workers include migrants from the countryside, the unemployed, the disabled, widows, children, and older people. Sixty-seven percent are women and 95 percent are from the indigenous Aymara and Quechua communities and live in precarious socioeconomic circumstances in peri-urban areas" (ILO, 2014)

Research focusing on workers dismantling e-waste, mostly mobile phones and computers, in a scrap metal yard in Ghana, suggest that the dismantling of electronics is associated with serious environmental and social hazards. It showed that e-waste workers experience poor working conditions, being in daily contact with dangerous chemicals, thus exposing themselves to significant health risks giving the lack of proper tools and protective equipment. E-waste processing in this site was found to be men-dominated, with women are seen selling food and water in the area (Schneider , 2019), in a previous investigation children as young as 5 years old and most boys were reported to carry much of the work (Greenpeace, 2008).

Figure 3. Informal e-waste sector hierarchy in India



Source: ILO E-waste in India (Geneva, 2019)

E-waste workers tend to work in hierarchies based on their experience. In Ghana, those who have been on the site for longer tend to occupy the highest positions, they teach newcomers and coordinate their work, while novices do usually start by burning cables or by going around the neighborhoods as scavengers (Schneider, 2019). The e-waste industry can also attract migration waves from both rural and urban areas, which creates many challenges in a very complex system that is rooted in socio-economic injustices and underlying gender dynamics.

"In informal waste 'recycling,' men were observed to be doing jobs of melting plastics without any protective gear nor filters in the 'factory.' However, women were sorting the plastics in the room next door, which was equally filled with the smoke from the smelter". (WECF, 2017)

"Women and children are frequently involved in the lowest-paid jobs of both solid and e-waste management and do not reap the same profits from their work as men". (ILO, 2019)

According to studies conducted in 6 cities worldwide which focused on those who make a living by extracting value from solid waste, results showed that the informal waste and valorization economies are mostly dominated by women who tend to perform low-paying tasks upstream the value chain as pickers, sorters, and traders. While policy interventions may try to shift the flows of solid waste from informal to formal, the resulting socio-economic repercussions should be clearly understood as women are most likely to bear a greater share of the burden (Gunsilius, Chaturvedi, & Scheinberg, 2011). Not only are women more represented in the informal sector compared to the formal one, but higher incomes may drive more interests and competition from men while increases in workload could make it harder for women to combine heavy workloads with domestic work at home.

"The professionalization of some waste activities is displacing women"..."Collecting gender-disaggregated data about the labor force throughout the waste sector will enable changes and trends, such as women's displacement, to become more

visible. Commitments towards equal employment opportunities could be incentivized to prevent women from being excluded from this increasingly desirable job sector". (UNEP, 2019)

In Vietnam, women recyclers living in e-waste recycling sites were found to have higher POPs levels by examining breast milk samples, indicating an increased exposure to low-chlorinated PCBs and high-brominated PBDEs, which could be possibly explained by inhalation and ingestion of dust. Furthermore, infant intake from breast milk was found to be close or even higher than the maximum acceptable dose referred to as reference dose by the US EPA (Tue, et al., 2010). In Bangladesh, an assessment of maternal-child exposure found low levels of POPs in samples of human cord blood and stressed the need to monitor new POPs to which exposure could be increasingly driven by industrialization and poorly regulated management of waste and recycling. (Leung, et al., 2018)

"A study on the informal e-waste management sector revealed that the e-waste refurbishing, collection, and recycling sectors in Nigeria are dominated by adult and child male workers. There are hardly any women working in refurbishing and repair operations itself. Nevertheless, women make up a significant share of the workforce among the waste picker communities on dumpsites, where women and girls are estimated to make up around 30% of the workforce. (Osibanjo, nd)

Quoting from an article - "Of course, it isn't healthy, said Lu, a woman who was rapidly sorting plastic shards from devices like computer keyboards, remote controls, and even computer mice. She and her colleagues burned plastic using lighters and blow-torches to identify different kinds of material. But there are families that have lived here for generations ... and there is little impact on their health. Several migrants said that while the work is tough, it allows them more freedom than working on factory lines where young children are not permitted to enter the premises and working hours are stringent".

A female worker in China's Guiyu (CNN, 2013) .

In China, POP-PBDE were screened in milk, placenta, and hair samples collected from women of reproductive age working in e-waste recycling, results indicate that primitive recycling of electronic waste increases exposure to POPs among local residents with related health consequences posing potential threats to infants as well (Leung, et al., 2010). In South China, levels of Dechlorane Plus, one of the new POPs recently proposed for listing under the Stockholm Conventions, were higher among occupationally exposed workers in comparison with urban residents in an e-waste recycling region. Serum concentrations were significantly higher among women, further investigations to assess whether men may have a higher metabolic potential compared to women, or whether there is gender-specific patterns influencing the uptake and excretion are yet to be conducted (Yan, et al., 2012). An earlier study examined the exposure of e-waste workers to polybrominated diphenyl ethers among workers, it indicates that occupational exposure can lead to elevated levels of these chemicals among workers dismantling electronic waste (Qu, et al., 2007).

"The inequality of the gendered labour market is also reflected in the health hazards that affect female workers at the bottom of the e-waste value chain" (ILO, 2019)

"I didn't realize that there is an easy and safe way of dismantling e-waste until I participated in the training. I am happy that there is a TSD (treatment, storage, and disposal) facility for e-waste and there are new techniques being taught to us"

Charina Davin, female e-waste dismantler Manila, Philippines (UNIDO, 2020)

In Canada, an assessment of co-factors of exposure to flame retardants in e-recycling facilities showed that polybrominated diphenyl ethers topped the list of the 39 chemicals detected in the air. A very interesting finding was the higher exposure associated with specific tasks such as dismantling, crushing, and bailing, as well as with specific products such as cathode ray tubes, computers, and TV screens. To extrapolate these findings using gender lenses, further investigations would be crucial to understand the gender roles assigned to women and men in the e-recycling industry, to potentially uncover any gender-differentiated exposure based on who performs which specific tasks, and who manipulates which specific products (Gravel, et al., 2019).

"We don't want to get stuck in our associations," "When we look at the national leaders [of the MNCR], we only see men."
Participant at the Third National Women Waste Pickers' Congress

"We have to get involved in politics to better achieve our rights."
Participant at the Third National Women Waste Pickers' Congress

Along the e-waste value chain, there is much to be done to minimalize the environmental footprint and reduce the toxic burden on some of the poorest and most vulnerable populations. While policymakers should establish an appropriate enabling environment by setting up adequate legislation and legal frameworks, electronics producers should eliminate the use of hazardous substances in their products, and track the entire life cycle of their goods (Greenpeace, 2008).

Similar to other sector-specific transitions towards a greener economy, a gender-sensitive transformation towards green jobs in the field of POPs management across industries and economic sectors where these chemicals are used can support social inclusion and provide better job opportunities and livelihoods for women as well as for other vulnerable social groups. For instance, the recycling of waste in European countries can create higher-income jobs when compared to landfilling and incineration (EEA, 2011). There is also a need to channel more e-waste flows from informal to formal sectors to create jobs for low-skilled workers (Annamalai, 2015), and raise awareness among women, children, and other vulnerable social group working along the e-waste value chain to reduce their exposure to harmful chemicals including POPs.

*Madhuben, a traditional waste recycler picking up waste from the roadside in Manechowk area in Ahmedabad says, "**I used to pick up the waste from Manekchowk area, one of the oldest and busiest commercial areas in the city. I used to get the e-waste also. At that time I did not know what e-waste was. But I still picked it up as it fetched better money. After collection, I would break it up which used to cause skin rashes and breathlessness, incurring expenses on treatment. But still, I picked up the e-waste because it fetched money. As a member of SEWA, I became part of e-waste program by undertaking the training on its hazards, disposal and recycling practices. I feel very proud as not only my health problem has decreased but I am also contributing in***

saving our environment. I also feel to be a Change Agent by convincing my other bens (sisters) to be a part of this initiative." (GIZ, 2016)

This being said, for such a transition to an inclusive green growth model to succeed, there is a critical need to understand the risks it entails. If women and other vulnerable social categories are not empowered to fully participate in the formal economy, these will be further excluded, hence the importance of understanding the local contexts, its social structures, power relations, and the underlying gender dynamics (Benson, et al., 2014). Due consideration should be also given to the gender-specific dynamics and interlinkages between social inequalities and power structures in the informal e-waste sector, in order to have a better understanding of how women, men, and other social groups are affected in different ways from the social, health and economic impacts associated with exposure to e-waste (Lines, Garside, Sinha, & Fedorenko, 2016).

By doing so, policymakers and practitioners managing POPs can reverse the tide of informality to shape gender-informed transitions to more inclusive and greener economies. Examples of supportive measures include setting specific quotas for women-owned small businesses, adopting flexible working hours to allow women to fulfill other domestic and care responsibilities, and enabling women to receive specific training related to financial literacy, technical skills, health, and safety (Benson, et al., 2014).

Table 4. Gendered roles in the landscape of waste management in Bhutan, Mongolia, and Nepal

City	Gender	Policy and governance	Formal Operational levels (waged)	Informal Operational levels (unwaged)
Ulaanbaatar Mongolia	Women	- (Mostly) Organizers known as "kheseg leaders" at the sub-district level (khoroos).	- (Traditionally) Street sweepers. Since the position became professionalized and the salaries increased, women have been losing these jobs; - Head of several of the private sector small-enterprise recycling operations, as well as "green art" companies.	- (Mostly) Waste pickers at the landfills[62];
	Men	- (Largely) Managers at the highest levels;	- (Exclusively) Waste collection truck drivers and loaders; - (Exclusively) landfill operators; - (Mostly) managers of the private waste collection business that have contracts with the city; -(Mostly) Managers in the municipal departments responsible for overseeing waste management.	- (Mostly) Street pickers who also live on the streets; - (Almost exclusively) run Small-scale enterprises "Junk shops";
Kathmandu Nepal	Women	- Limited participation in political, administrative, and economic leadership.	- Collect money for waste services; - (Mostly) fill the role of the street sweeper; - (Mostly) head of small-scale enterprises, such as composting; - (Mostly) Create crafts from waste materials;	- (Mostly) Waste pickers at landfills; - (Predominantly) Waste pickers at the transfer station are women;

[62] [62]: no firm data are available, but reports indicate that most of the pickers are women. They are also mostly poor, recent rural-urban migrants, who live near or at the landfills.

	Men	-(Largely) high decision-making positions at the national and municipal levels.	-(Exclusively) truck drivers, loaders, and mechanical maintenance workers; -Monitor and oversee the landfill and are landfill operators; -(Mostly) Managers, advisors, supervisors, and other similar positions.	-(Exclusively) Waste collectors by bicycle are exclusively Indian men; - Scrap dealers that sell goods from street pickers.
Thimphu Bhutan	Women	- (limited role and little participation) political, administrative, and economic leadership levels.	- (Mostly) Street sweepers are mostly women; - Gender parity among waste pickers that work with contracts; -Gender parity especially within public administration.	- (Mainly) Waste pickers; - Recycling in the sense of weaving baskets or making flowers is typically seen as being a female activity; - Both men and women.
	Men	- High decision-making positions both at the national and municipal levels and also on boards of directors.	- (Mostly) Office cleaners; -(Exclusively) Waste collection truck drivers and handypersons; -(Predominantly) Managers in both the public and private sectors; - (More men than) Boards of directors; - (Mainly) Social entrepreneurs in the waste sector; -(Mainly) head of some higher technological recycling (e.g. plastic for road construction).	- (Mainly) run second-hand/repair shops; - (Mainly) runs scrap.

Source: Adapted from UNEP 2019, Gender and waste nexus Experiences from Bhutan, Mongolia, and Nepal

Industrial POPs: Cleaning Products

Occupational exposure among professional cleaners remains an important health issue. Various investigations of occupational health risks in the cleaning industry indicate that professional cleaners can be exposed to different chemicals and tend to report greater health hazards compared to the general working population based on the tasks assigned to them and their working conditions. This is the case for instance of POPs found in cleaning products, such as perfluorooctane sulfonate incorporated as surface-active agents (Meesters & Schröder, 2004) and Perfluorinated alkyl acid (EC, 2017). The screening of 105 professional cleaning products used in Switzerland showed more than 132 different chemicals including surfactants, glycol ethers, and solvents. Such mixtures enable simultaneous exposures to irritant, corrosive and harmful substances that may lead to several health hazards (Gerster, Vernez, Wild, & Hopf, 2014).

"Results of the pilot study showed that impacts on women were significantly higher as compared to men, due to the higher exposure of women to cleansing agents. This higher level of exposure can be attributed to a gender-role typical division of household labour, in which women perform more household cleaning, have a more predominant role in choosing cleansing products, and are thus exposed to more advertising for these products" (Sauer, et al., 2019).

In Belgium, higher mortality rates among professional cleaners due to respiratory cancer and other respiratory diseases could be the result of their exposure to chemicals such as POPs in cleaning products. Men working as professional cleaners experienced higher mortality risks when compared to non-manual men workers. Although the same conclusion is valid for women in comparison to non-manual women workers, comparing the mortality risk between women and men working as professional cleaners shows greater mortality rates among men than women when compared to the respective sex in the non-manual workers' category (Van den Borre & Deboosere, 2018). While there is no simple explanation to this, the answer is likely complex and factors-in several underlying gender dynamics.

In traditional households, women's additional income tends to complement the salaries earned by men as the main breadwinner. This could explain why more female cleaners left their job when experiencing health problems in contrast with their male counterparts for whom it might have been more financially challenging to stop working. The specific composition of cleaning products used in industrial settings where male cleaners tend to be employed could lead to higher exposure to some chemicals (Van den Borre & Deboosere, 2018). Other plausible explanations could be related to the awareness level among men to the health hazards of cleaning agents, or by the adherence to the traditional gender roles assigned to men, such as invulnerability, resulting from exaggerated masculine traits (Sauer, et al., 2019).

Giving the multiplicity of micro and small companies in the cleaning industry, due consideration should be given to reach out to, inform and train professional cleaners about good practices in manipulating and managing cleaning products. Costs related to awareness-raising and training could be incentivized and reimbursed.

Industrial POPs: Toys

"A recent test of toys bought in more than 16 countries, including Nigeria, showed that in toys made of recycled e-waste plastics, high levels of hazardous chemicals such as flame retardants and phthalate plastic-softeners were found" (WECF, 2017)

Toys and other children's products are part of a wider pool of consumer goods such as personal care products, furniture, and food containers, that expose infants and children to harmful chemicals including POPs such as phthalates and brominated flame retardants. Significant amounts of dioxins and furans were found in children's toys and chair clips, in levels comparable to e-waste residues and waste incineration ash (Petrlík, Behnisch, & DiGangi, 2018). Polybrominated diphenyl ethers can be found in most products made out of recycled plastic despite existing legal restrictions. This situation could be explained by legal gaps in regulations or their lack of enforcement (Becker, Edwards, & Massey, 2010).

Children can be greatly exposed to high daily intakes of POPs such as chlorinated phosphate esters (TDCPP) found in polyurethane foam used in baby products (Stapleton, et al., 2011). The mouthing behavior observed for infants and toddlers can lead to greater exposure to polybrominated diphenyl ethers compared to inhalation, dermal contact, and oral ingestion (Chen, et al., 2009). A community survey in Lebanon showed that most households purchase inexpensive plastic toys and modeling clays with only 17% of parents being aware of the associated health hazards (Korfali, Sabra, Jurdi, & Taleb, 2013). Another survey of products from 26 countries found POPs such as octabromodiphenyl ether (OctaBDE), decabromodiphenyl ether (DecaBDE), and hexabromocyclododecane (HBCD) in recycled plastic used in children's products. Its findings suggest that recycled plastic from e-waste contains toxic flame retardants that contaminate new plastic used in children's toys and associated products (DiGangi, Strakova, & Bell, 2017). Another study found that incidental ingestion of toys' plastic could be a significant if not the main source of children's' exposure to brominated flame retardants (Fatunsin, et al., 2020).

From a gender perspective, the pink doll versus the blue truck divide shows the gendered toy industry and points to the existing gender stereotypes which could suggest possible differences in the ways boys and girls are exposed to POPs in toys and other children's products. Nevertheless, more research is needed to uncover the underlying gender dynamics and examine for example whether toys marketed for boys contain high levels of POPs compared to toys marketed for girls and vice versa. In two observational studies, no association was found between the mouthing frequency and gender but rather with the age category of children (Groot, Lekkerkerk, & Steenbekkers, 1998), (Tulve, Suggs, Mccurdy, Hubal, & Moya, 2002).

More investigations are needed to address the knowledge gap regarding the exposure of children to harmful chemicals in toys, larger samples are needed in order to cover the wide geographical scope of the worldwide mass production of toys (Ionas, Anthonissen, Dirtu, & Covaci, 2012). Furthermore, there is a data gap regarding exposure to some POPs, such as brominated dioxins, in the absence of sufficient regulations to control their use and monitor their impacts especially on vulnerable social categories including children and women of reproductive age. By drafting and enforcing gender-responsive legislation, policymakers can mitigate consumer exposure for instance to Polybrominated dibenzo- p-dioxins and dibenzofurans used in children's toys, care products marketed for women, and kitchen utensils (Petrlík, Behnisch, & DiGangi, 2018).

The screening of 126 chemicals used in plastic toys in a recent study identified 31 chemicals of concern given their high hazard quotients and cancer risk. While these findings suggest that plastic toys could represent potential health risks, it underscores the critical need for gender-sensitive research to investigate the composition of materials used in plastic toys, to better assess the associated risks

for girls and boys through a mouthing exposure model, and to develop screening methods that quantify acceptable chemical thresholds in toys. Similar efforts should be deployed to actively explore the use of healthier and more environmentally friendly alternatives (Aurisano, Huang, Canals, Jolliet, & Fantke, 2020).

As we strive to build back better and transition towards circular economies, concerns related to the use of recycled plastics containing hazardous chemicals in new toys are yet to be fully addressed. Recycled materials are most likely a major source of exposure to flame retardants and plasticizers re-used in toys and children's products (Ionas, Dirtu, Anthonissen, Neels, & Covaci, 2014). Hence the urgent need for Governments and private sector actors to apply stricter-restrictions and design safer products such as by using the principles of green chemistry and other eco-friendly alternatives.

Industrial POPs: Textiles

Besides accounting for more greenhouse gas emissions per year than all international flights and maritime shipping combined (EMAF, 2017), the textile industry is also a significant source of exposure to hazardous chemicals affecting occupational workers but also the end consumers of its products.

Organic pollutants can be present in the raw materials used in the textile industry and may be released at the processing stage into the air or water. Natural fibers such as cotton and wool, for example, may contain pesticide residues including pentachlorophenol and other organochlorine pesticides. Synthetic fibers such as polyester and acrylic, on the other hand, may contain impurities such as phthalate esters. Finishing processes such as de-sizing, scouring, bleaching, printing, dyeing, finishing, coating, washing, and drying, may also produce organic pollutants such as dioxins which could be found in textile effluents (Le Marechal, Križanec, Vajnhandl, & Valh, 2012). The use of colorants with complex chemistry may represent a non-negligible source of dioxin and dioxin-like POPs in textiles (Križanec & Le Marechal, 2006).

Wastewaters released by the textile industry can be a significant source of exposure to POPs (Le Marechal, Križanec, Vajnhandl, & Valh, 2012). These chemicals may be removed from textile wastewaters by using different recycling approaches such as membrane processes, biological and physicochemical treatments (Musteret & Teodosiu, 2007). While many investigations focused on chemicals in textile wastewaters, POPs residues can also be found in textile products sold on the market, thus pointing to clothing products for instance as potential sources of exposure to harmful chemicals through skin contact besides being a source of environmental pollution through laundering and household wastewater (Avagyan, Luongo, Thorsén, & Östman, 2015). This shows that addressing concerns regarding exposure to POPs in the textile industry is not just about textile producing countries, it can happen anywhere in the world, in any place where clothes are used and washed.

For instance, perfluorinated compounds such as PFOA labeled as emerging POPs giving their potential immunotoxicity (Corsini, Luebke, Germolec, & DeWitt, 2014), are used for soil and water repellence in carpets, furniture textile and weatherproof jackets. Phthalates such as DEHP are another example, they are used as plasticizers, softeners, and solvents in many textile products such as T-shirt prints, shower curtains, jeans, and backpacks. Flame retardants such as DecaBDE are also found in clothing products (KEMI, 2013). In a rapidly evolving textile industry, it is hard to assess which chemicals are covered by which regulations. In the EU for instance, while certain brominated flame retardants are restricted such as polybrominated biphenyls, others are not (Cobbing & Ruffinengo, 2013). This being said, both

textile workers and end consumers can be exposed to POPs used in textiles, hence the need to understand the gender roles played by women and men along the textiles value chain to uncover their differentiated exposure to such harmful chemicals. As shown in a recent review, occupational workers in the textile industry may face higher risks to develop cancer (Singh & Chadha, 2016).

While several persisting challenges to achieve gender equality are reported in the garment industry, we need to understand how the social determinants of gender inequality exacerbate the exposure of workers and end-users to POPs from a gender perspective, in order to develop meaningful gender-response management strategies and action plans.

Women tend to be found in low skilled and low paying jobs such as sewing machine operators, in contrast with a high proportion of men and high skilled and better-paid jobs. Discouraged from assuming leadership roles and expected to fulfill other domestic duties, women are significantly underrepresented in supervisory and managerial positions. Sexual harassment is also widespread and remains largely underreported. This could be explained by the underlying negative cultural norms, driving fears among the victims as well as a tendency to "normalize" such behaviors. Another key element to consider is the prevailing stereotypes and perceptions about the aspirations of women and men, their skills, and attitudes. For instance, men could be perceived as troublemakers and face discrimination during recruitment, the same applies to pregnancy-based discrimination against women. While the gender pay gap reduces the earning capacity of working mothers, long working hours increase the burden on women who have additional caregiving responsibilities in their households and communities. Moreover, women are most likely to be employed using shorth term contracts, hence the tendency among pregnant women to receive no maternity leave benefits (Janssen & Rossi, 2018).

The fact that women represent the majority of garment workers, is probably not a coincidence and could be attributed to the existing cultural stereotypes. Such gender dynamics may explain the extra burden on women working in the textile industry in contexts of poverty and economic hardship, in comparison to their men counterparts, which could in return exacerbate their exposure to POPs and other harmful chemicals.

Industrial POPs: Beauty and care products

"Lindane is still widely used as head lice treatment registered as Gamaxene. In the last couple of years, there were many cases of pesticides and lindane poisoning among women and young girls". (WECF, 2017)

As thousands of chemical compounds are used in the formulations of thousands of tons of cosmetic and care products that are produced and consumed every year, it wouldn't be exaggerated to say that very little is known about the potential health and environmental hazards associated with exposure to beauty and care products what are manipulated on a daily basis. These chemicals can escape conventional water treatment processes and bioaccumulate in the environment, while little is known about their potential impacts (Juliano & Magrini, 2017). Phthalates can be found in several products such as perfumes, hair sprays, nail polish, body washes, skin cleansers, and baby products. A study in Canada showed that Diethyl phthalate was the most encountered and the phthalate to which toddlers and infants were mostly exposed (Koniecki, Wang, Moody, & Zhu, 2011).

"Workers in the beauty industry, who are predominantly women of color and immigrant women, can also face occupational health hazards from chemicals in professional cosmetic

products and ad-hoc workplace safety standards". (Zota & Shamasunder, 2017)

This is also the case of potential new POPs such as organic UV filters, which can be found in several products including sunscreen agents, creams, body lotions, and shampoos, and which behave similarly to POPs in terms of their bioaccumulation and persistence in the environment (Kameda, Tamada, Kanai, & Masunaga, 2007). Such pollutants could be released through swimming, bathing, and wastewater, and could be widely spread in aquatic environments and found in places such as river and lake sediments (Kaiser, Wappelhorst, Oetken, & Oehlmann, 2012).

Exposure to chemicals used in beauty products such as phthalates was reported to be a health disparity concern. In one study in the US, women in the age category 18-34 tend to buy more than 10 beauty products per year, which makes them vulnerable to toxic chemicals if these products are used during critical periods such as during pregnancy. Equally interesting, are the rational and ethnic differences regarding health risks associated with skin lighteners, hair straighteners, and feminine hygiene products. In contrast with white women, women of color from different socio-economic backgrounds were found to have higher levels of chemicals in their bodies arising from the use of beauty products (Zota & Shamasunder, 2017).

"Differences in diethyl phthalate exposures between African American and white women were no longer statistically significant after douching practices were accounted for, which suggests that vaginal douching may contribute to racial/ethnic disparities in phthalates exposure". (Zota & Shamasunder, 2017)

Despite the growing market for men's personal care products, the market size of the cosmetic and personal care industries suggests that most women use more beauty and care products than men. Thus, it is assumed that the higher burden of beauty still falls on women, considering that it can be used as a norm to discriminate against those women who deviate from how they should look like (Leibu, 2014). By using more products, women could face greater exposure to several chemicals including POPs. This should be further investigated through gender-sensitive research to further uncover the interplay between sex, gender, and exposure to POPs found in cosmetics and care products.

POPs and air pollution

Several compounds are addressed through the Protocol on POPs to the UNECE Convention on Long-range Transboundary Air Pollution (or LRTAP). Pesticide POPs like DDT, industrial POPs like PCBs, and by-products such as dioxins and furans are hazardous air pollutants. Air remains the main route for long-range atmospheric transport of several POPs including transboundary flows to areas with no emission sources, hence the importance of monitoring POPs levels in the atmosphere. For instance, dioxins and furans can be released into the air from different sources including the incineration of wastes, paper manufacturing, metal production, and refining processes. Despite the progress achieved in air monitoring and emissions modeling, the lack of emission inventories and issues related to data comparability are yet to be fully addressed (Hung, et al., 2013). More research is needed, including in remote areas, to better understand transport patterns and exposure to atmospheric POPs.

A study of long-term temporal trends of POPs in the atmosphere in Africa which monitored 20 POPs in 9 countries between 2008 and 2019, shows that while overall the concentration levels of several POPs are decreasing, others remained stable or even increased in some locations which could be explained by sustained local emissions due

to open burning of waste (White, et al., 2020).

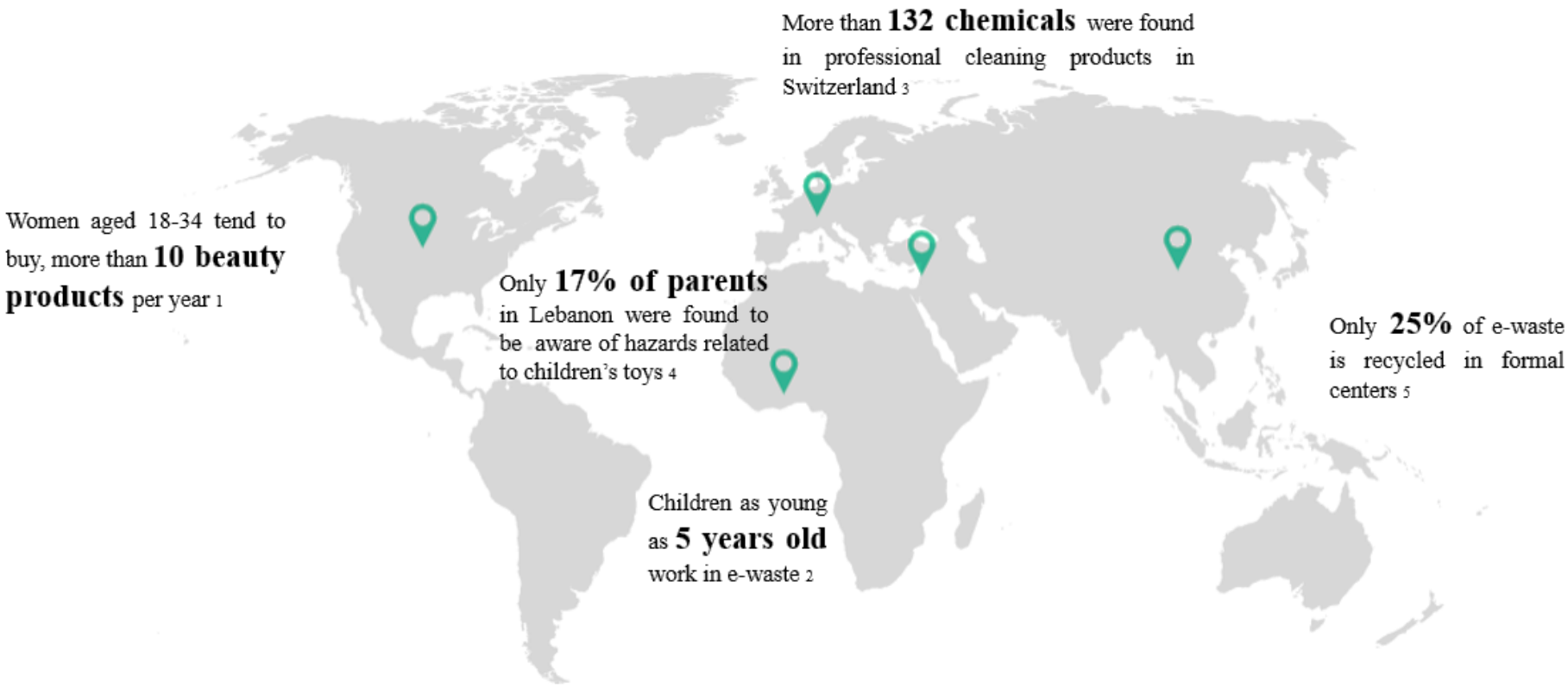
Seen with gender lenses, air pollution is a serious gender issue. In 2013, about 5.5 million lives and US$225 billion of labor income were estimated to be lost due to exposure to outdoor and household air pollution (World Bank, 2016). This shows not only the health burden but also the economic footprint associated with air pollution which may disproportionately affect women. In Peru, a study suggests that air pollution can reveal gender-based inequalities in care, women tend to work less during high pollution weeks because they have to stay with their children who are unable to go to school (Montt, 2018). In one study in Korea, the adverse effects of outdoor air pollution on the cognitive function appeared to affect elderly women more than men (Kim, et al., 2019).

"Empirical evidence shows women more often than men deal with household waste by burning waste in open fires in homes and yards, thus releasing and being exposed to furans and dioxins (unintentional POPs") (WECF, 2017)

Women are also disproportionately affected by indoor pollution emanating from different sources including unhealthy energy sources used to cook in the household, and the spray of pesticides such as DDT for malaria control. One study in sub-Saharan Africa suggests that biomass burning explains up to 10% of the PCDD concentrations in rural and background atmosphere (Lammel, Heile, Stemmler, Dvorská, & Klánová, 2013).

While the unevenly distributed burden associated with the exposure to atmospheric POPs can be explained as the result of the complex interplay between sex and gender, through differentiated exposure patterns and biological responses, more research is needed to better understand localized gender norms and develop context-specific gender-informed responses to pollution management.

Figure 4. Gender-Smart NIPs: on the path to "detox the future"



Sources: (1) In the US, women of color from different socio-economic backgrounds were also found to have higher levels of chemicals in their bodies arising from the use of beauty products such as skin lighteners, hair straighteners, and feminine hygiene products (Zota & Shamasunder, 2017). (2) In Ghana, children were found to carry out much of the work at the scrap yards filled with TVs, monitors and computers, using basic tools with bare hands (Greenpeace, 2008). (3) In Switzerland, these chemicals were found in professional cleaning products such as surfactants, glycol ethers and solvents (Gerster, Vernez, Wild, & Hopf, 2014). (4) In Lebanon, not many parents are aware of the health hazards associated with inexpensive plastic toys and modeling clays used by their children (Korfali, Sabra, Jurdi, & Taleb, 2013). (5) In China Guiyu, where 70% of the world's e-waste ends up, about a quarter only is formally recycled (Li & Achal, 2020).

Element A2.3 Health implications associated with exposure to POPs

Despite many POPs being banned, these chemicals are still present in the environment and continue to threaten human health. There is an increasing body of medical research conducted to uncover the possible associations between exposure to POPs, often indicated in terms of high concentrations in body samples, and a wide range of adverse health effects encompassing future generations. Nevertheless, most research efforts focused on small subsets of POPs within specific geographies, and need to be replicated in larger studies. Some investigations did however attempt to further explore the linkages between POPs, as a risk factor to human health, and gender, diets, lifestyles, education and income levels, and other socio-economic factors.

Based on an analysis of the available literature, one could say that from a biological standpoint women and men do both suffer hugely from their exposure to POPs. However, this could be further nuanced through sex-specific considerations by capturing the extra burden related to the adverse effects of POPs on maternal health, and the risk it entails to the health of newborns and future generations. This being said, by digging deeper, the vulnerabilities and risks associated with exposure to POPs seem to have less to do with sex and biological factors and appear more interlinked with gender aspects related to a large array of social, cultural, and economic determinants behind the prevailing perceptions, stereotypes, and roles assigned to women and men in a given context, in a given society.

Diets, lifestyles, and socioeconomic factors

Studies conducted in Barcelona and Crete showed that maternal diets that are higher in fat were associated with higher serum concentrations of lipophilic POPs in maternal blood, with plausible impacts on anogenital distances in children suggesting that prenatal exposure to POPs could be a contributing factor to the alteration of physical properties of the reproductive system (Papadopoulou, et al., 2013). In the Arctic, it is likely that diets relying on marine food, as well as factors related to socioeconomic status, lifestyles, and food insecurity, can increase exposure to POPs and lead to higher risks (Bank-Nielsen, Long, & Bonefeld-Jørgensen, 2019). Raising awareness remains key to limit the exposure of youth to traditional marine food contaminated by POPs, improving thus maternal health while ensuring healthy future generations (Skaarup Knudsen, Long, Pedersen, & Bonefeld-Jørgensen, 2015). In California, serum levels of POPs collected from women of reproductive age were associated with fish consumption, while factors such as ethnicity, country of origin, household annual income were found to be associated with an increased intake of POPs found in residential dust (Whitehead, et al., 2015).

Healthier diets during the pregnancy of Hispanic mothers were associated with lower exposure to POPs (Gross, et al., 2020). A study explored exposure to POPs among black women of reproductive age in the US, its results showed that older age was associated with higher levels of organochlorine pesticides, suggesting an earlier exposure probably through drinking water, alcohol, and tobacco (Orta, et al., 2020). Another study investigating the association between serum levels of POPs and smoking among Koreans according to gender indicates that women smoking less than 15 cigarettes per day were most likely to have high levels of POPs compared to women who never smoke, while the same could be said for men as well (Moon, Lim, & Jee, 2017). In Greece, levels of exposure to several POPs were assessed in pregnant women using hair, serum, and amniotic fluid samples, showing higher concentrations among smoker pregnant women, and indicating PCB levels inversely

proportionate to the age of pregnancies (Barmpas, et al., 2020).

In the US, research investigating the possible linkages between high levels of POPs and socio-economic factors such as gender, race, and ethnicity suggest that more than 1/10 of the US population could possibly have high levels of POPs, this was most frequently the case of non-Hispanic blacks, followed by non-Hispanic whites, and less frequently among Mexican Americans (Pumarega, Gasull, Lee, López, & Porta, 2016). A study conducted in Catalunya suggests that while both women and men with lower education showed higher unadjusted POP levels, these were also higher among women belonging to less affluent social classes (Gasull, et al., 2013). This shows that women with low social status could be more vulnerable to POP compared to men from the same social class.

"I only used endosulfan once. Besides being prohibited now by the co-operative, it's polluting and it's bad for your health - you could get a worker poisoned. We've had the experience with some neighboring farms using endosulfan and the workers got poisoned, they had to be taken to hospital and given stomach rinses - a serious problem!"

Bernardo López, male farmer, Nicaragua

"Please stop using endosulfan - it's killing people and all the fauna! It's perfectly possible to control borer on a large farm without endosulfan, using very good sanitary controls and applying Beauveria fungus."

Alfonso Gómez, La Palmera estate manager, Colombia
(FAO, 2014)

Reproductive health

Chinese women having high serum levels of PCBs and DDTs were found potentially at risk to suffer from primary ovarian insufficiency as an example of the reproductive burden associated with exposure to POPs (Pan, et al., 2019). With regards to fertility and reproductive outcomes in Sweden, serum concentrations of POPs among women aged 29 years and more were associated with lower fecundability and a higher likelihood of infertility (Björvang, et al., 2020). Another study indicated that estrogenic POPs can be associated with longer lactation periods among Mexican American women (Weldon, et al., 2010). Studies that examined the burden of exposure to POPs during fetal, childhood, and adulthood on male reproductive health, pointed to several adverse effects on sperm quality and reproductive hormone levels (Vested, Giwercman, Bonde, & Toft, 2014).

Metabolic Health

A growing body of evidence suggests that PoPs, such as PCBs, OCPs, and DDE, do possibly contribute to type 2 diabetes (Rylandera, Sandanger, Nøst, Breivikcd, & Lund, 2015); (Henríquez-Hernández L. , et al., 2017). In Algeria, a case-control study shows that higher levels of POPs were detected in the plasma of diabetic individuals, suggesting that exposure to POPs could be potentially associated with a higher risk to develop type 2 diabetes, with organochlorinated pesticides posing greater risks in comparison with PCBs (Mansouri & Reggabi, 2020). In Spain, the levels of certain POPs were found to be higher among diabetic people, suggesting their potential role as a risk factor in the development of diabetes (Henríquez-Hernández L. , et al., 2017).

A number of studies examined the disruptive effect of POPs on endocrine glands, pointing to the probable causal relationship leading to the alteration of their functions which can result in a wide spectrum of disruptions affecting puberty, sleep, reproductive system, metabolism, and even cancer (Lauretta, Sansone, Sansone, Romanelli, & Appetecchia, 2019).

Women exposed to endocrine disruptive chemicals were found more likely to have early menopause (Grindler, et al., 2015).

In the US, serum levels of some POPs had gender-specific associations with hypertension, PCDDs and PCDFs tend to be associated with hypertension among women while PCBs tend to be associated with hypertension among men (Ha, Lee, Son, Park, & Jr, 2009). In another study, although there was no strong evidence of a positive association, high serum levels of POPs mainly among younger women were positively associated with mammographic breast density, suggesting that early life exposure is a potential risk factor (Rusiecki, et al., 2020).

In Sweden, a large scale study was conducted in an attempt to assess potential causal pathways between exposure to POPs and liver dysfunction biomarkers, its results suggest that several POPs such as PCBs, OCDD, and pesticides could have adverse effects on liver functions (Kumar,et al., 2014). In Korea, exposure to PCBs could be significantly associated with adverse effects on the metabolic health of children, including diastolic blood pressure and triglyceride levels (Lee, Park, Hong, Ha, & Park, 2016).

In the Netherlands, an explorative study examined the association between POPs levels in DNA alterations in men, its preliminary findings indicate aberrant DNA methylation among men exposed to POPs through the consumption of contaminated eel (Dungen, Murk, Kampman, Steegenga, & Kok, 2017). Another study with the same focus, suggests that exposure to POPs is associated with epigenetic changes, with men experiencing DNA hypomethylation in contrast with DNA hypermethylation among women (Lee, Cho, Lim, & Jee, 2017).

Even though short-term studies were not conclusive regarding the contribution of POPs to cardiometabolic disorders following the intake of fatty fish by individuals experiencing overweight and obesity, more investigations are needed over the long term to assess the potential causal relationship between exposure to POPs and cardio-metabolic disorders (Dusanov, et al., 2020).

Maternal & children's Health

"Many of our women are getting breast cancer, and I remember thinking, is this a high number? Is this normal?" ... "I was really blown away by all the toxins we are exposed to. At the same time, I also learned they were toxins in breastmilk" ... "I learned they have done research about it and they found it from flame retardants" ... "I have breastfed my first child I taught I was giving him the best thing I could possibly give him, going back to work and still breastfeeding, and I taught what did I feed him?!"

Karen Kerr Stone, Female Lieutenant, fire department
San Francisco, USA
Hot toxic seat, HBO documentary

Various health effects associated with exposure to POPs were reported in pregnant women and their newborns in the arctic region (Bank-Nielsen, Long, & Bonefeld-Jørgensen, 2019). Alaska's native women were also found to be exposed to POPs, further research is needed to explore the possible causal relationship between exposure to POPs and breast cancer (Rubin, et al., 2006).

Fetal exposure among Hispanic families was confirmed as POPs were detected in newborn dried blood spots (Gross, et al., 2020). By examining the colostrum of 36 women in preterm labor in China, 10 were found to be exposed to DDT and another 2 to dieldrin (Wang, Yu, Zhang, Cui, & HaoSun, 2008). Another study in Mexico showed that children were exposed, reaching risk levels in some cases, with measurable levels of some POPs detected in plasma and urine samples (Trejo-Acevedo, et al., 2009).

Furthermore, exposed children with concentrations of POPs such as DDE, DDT, HCB, HCH, and PCBs detected in maternal blood, infant blood, breast milk, and cord blood were found to be more likely to suffer from possible neurodevelopment alterations (Verner, Ayotte, Muckle, Charbonneau, & Haddad, 2013).

The exposure pathways to POPs in daycare centers hosting children from low- and middle-income families showed differences based on the type of chemicals and the medium of exposure. While POPs levels were higher indoor compared to outdoor air, exposure for instance to organochlorine pesticides was mostly attributed to dietary ingestions, and PCBs were mostly inhaled (Wilson, Chuang, & Lyu, 2002).

In the US, research exploring the potential association between POPs levels in maternal plasma and fetal growth according to infant sex and maternal ethnicity, suggests that maternal exposure to mixtures of specific POPs could possibly reduce fetal growth even at low exposure levels (Ouidir, et al., 2020). Another exploratory study in the US compared the levels of some POPs in breast milk samples from obese and normal-weight lactating women, its results revealed no significantly higher risk of transmission while highlighting the adverse effects of POPs on breastfeeding (Gautam, Rogge, Acharya, Keesari, & Almekdash, 2020).

Figure 5. Getting to know the "forever-chemicals" known as POPs

US - Women exposed to endocrine disruptive chemicals were found more likely to have an early menopause (Grindler, et al., 2015).

US-Mexico - Estrogenic POPs can be associated with longer lactation periods among Mexican American women (Weldon, et al., 2010)

US- High serum levels of POPs mainly among younger women were positively associated and mammographic breast density, suggesting that early life exposure is a potential risk factor (Rusiecki, et al., 2020).

Spain - Levels of certain POPs were found to be higher among diabetic people, suggesting their potential role as a risk factor in the development of diabetes (Henríquez-Hernández L. , et al., 2017)

Algeria - Higher levels of POPs were detected in the plasma of diabetic individuals, suggesting that exposure to POPs could be potentially associated with a higher risk to develop type 2 diabetes (Mansouri & Reggabi, 2020)

Sweden - Serum concentrations of POPs among women aged 29 years and more were associated with lower fecundability and a higher likelihood of infertility (Björvang, et al., 2020).

Netherlands – Aberrant DNA methylation among men exposed to POPs through the consumption of contaminated eel (Dungen, Murk, Kampman, Steegenga, & Kok, 2017)

Greece - Maternal diets that are higher in fat were associated with higher serum concentrations of lipophilic POPs in maternal blood, with plausible impacts on anogenital distances (Papadopoulou, et al., 2013).

China - Women having high serum levels of PCBs and DDTs were found potentially at risk to suffer from primary ovarian insufficiency (Pan, et al., 2019)

Korea - Women smoking less than 15 cigarettes/day were most likely to have high levels of POPs compared to women who never smoke, the same applies to men (Moon, Lim, & Jee, 2017)

Element A2.4 Gender-responsive management of POPs: challenges and opportunities

The glass can be described as half empty in light of the several challenges facing gender-responsive management of POPs. First and foremost, while some aspects related to sex and biology were studied to some extent in terms of how males and females are exposed to POPs and how they are affected, in most cases, we know very little at best about the interplay between complex gender dynamics and the cumulative impacts associated with the exposure of women and men to these harmful chemicals.

"*I used to pick up the waste from Manekchowk area, one of the oldest and busiest commercial areas in the city. I used to get the e-waste also. At that time, I did not know what e-waste was. But I still picked it up as it fetched better money. After collection, I would break it up which used to cause skin rashes and breathlessness, incurring expenses on treatment. But still, I picked up the e-waste because it fetched money. As a member of SEWA, I became part of the e-waste programme by undertaking the training on its hazards, disposal and recycling practices. I feel very proud as not only my health problems have decreased but I am also contributing to saving our environment. I also feel to be a Change Agent by convincing my other bens (sisters) to be a part of this initiative*".

Madhuben, traditional female waste recycler from Ahmedabad, India
Promoting women's Participation in e-waste Recycling, GIZ report

In terms of data availability, there is a huge need for quality data that is sex-disaggregated but also gender-sensitive. Given the large number of POPs that are used in a wide array of products, it is very difficult to see the full picture and understand the extent to which human health and the environment are affected by these hazardous chemicals, let alone going another step further to uncover the possible ways in which the underlying gender dynamics in a given industrial or geographic context, could shift the burden of exposure to POPs towards women or men and exacerbate the associated harmful impacts. This situation could become even more complex in the future with the listing of additional new-POPs and POPs-like chemicals under the Convention as environmental health research is desperately trying to keep up with the speed in which new chemicals are found, integrated into complex formulations, and used across a wide spectrum of products, industries, and geographies.

Second, even in situations where some data exist which is generally the case of the most studied POPs such as pesticides, it could remain siloed and not accessible. It is thus critical to establish effective communication and knowledge management channels such as the SAICM knowledge platform and create cross-functional teams with the right pool of expertise where POPs specialists work together with environmental health researchers and gender experts. The extra mile that is needed here is to go one step further to decode the technical jargon of POPs, to turn its acronyms, exposure pathways, and harmful effects into a language that is understood by all especially those most at risk including women, children, and other vulnerable social groups such as occupational workers, refugees, minorities and people facing economic hardship or discrimination.

A growing body of knowledge suggests that women tend to be affected more than men from their exposure to POPs, this could be explained by social and cultural norms, as well as economic factors. Women are more likely to have a higher intake of traditional food, have a lower household income,

experience food insecurity, and suffer from economic hardship putting themselves at risk to provide for their families. Now, if we can't see the full picture, we may not be able to understand how the underlying social and cultural norms in a given context influence exposure to POPs, how being a woman or a man and how behaving the way a woman or a man are expected to behave in a given society, may exacerbate vulnerabilities to POPs among the most susceptible social groups.

The glass could be also seen as half full, with many opportunities to be seized to detox the future of women, men, and future generations. While there is an increasing consensus about the harmful effects of POPs on human health, the pace of today's technological advances, non-tech innovations, and scientific discoveries could enable gender-sensitive research and support the investigations needed by the international community in its race to unpack the gender narrative for more effective management of POPs. The same applies to developing alternatives to POPs, such as through the principles of green chemistry, agroecology, and the use of biopesticides.

By unpacking the gender narrative, the dividend could be twofold. When women are exposed to POPs, the adverse effects transcend the transgenerational barrier going beyond women's health and maternal health to become a health issue for future generations as well. This is why awareness-raising, exposure history, dietary patterns are critical information for women of reproductive age, but also those most exposed women working at the frontlines in the manufacturing industry and agricultural sector (Wahlang, 2018).

To conclude, gender-differentiated exposure to POPs could be explained by various underlying social and cultural determinants. While such prevailing norms may not be challenged overnight, by identifying entry points to mainstream gender into the strategies and action plans for the management of POPs we can challenge such assumptions over time and uproot the drivers of gender inequalities affecting those most vulnerable to the harmful effects of chemicals and wastes containing or contaminated with POPs.

Section B - Gender considerations in the planning and design of policy and strategy documents for the management of chemicals

Overview

The purpose of this section of the guide is to provide guidance in integrating gender during the development process of NAPs and NIPs. Much of the information in this section is also relevant to other national policy or strategy-setting exercises in chemicals management and beyond.

Supported by the UNEP Chemicals and Health Branch, countries working to comply with the Minamata and Stockholm Conventions, are required to develop and implement NAPs for ASGM (for parties where the activity using mercury is more than insignificant), and NIPs for POPs, respectively, to achieve sound chemicals management. Considering the interplay between sex, gender, and the multifaceted impacts resulting from exposure to chemicals such as mercury and POPs, it is crucial for countries to mainstream gender considerations into the design and development of their NAPs and NIPs.

We examine through gender lenses the national processes to develop policy and strategy documents in the fields of ASGM and POPs management. These processes will be deconstructed into key relevant milestones, including Context analysis, Project design, Stakeholder Involvement, Consultations, Data collection, Data Validation, Prioritization, Endorsement, Resource Allocation, Monitoring and Evaluation, and Knowledge Management. The gender gaps will be then examined and meaningful entry points identified for gender mainstreaming into the planning and design of gender-responsive policies and strategies. This should be done in an inclusive and participatory manner, with inputs from the different stakeholders.

Gender mainstreaming goes beyond simply having a specific women's component in a project or program. Good gender mainstreaming entails engaging both women and men to address gender inequality and promote their respective advancement[63]. Gender mainstreaming should be embedded in all the steps of policy planning and strategy setting to ensure that follow-up interventions advance women's equal participation and reduce gender inequalities. Gender-responsive processes guided by best practices in mainstreaming gender in chemicals management and other relevant sectors[64] should become the norm. This is to ensure that existing gender inequalities are not exacerbated as a consequence of gender-blind interventions.

Figure 3 below illustrates the steps of the process to develop NAPs and NIPs. This section provides guidelines and key gender aspects at each step. Also, the section refers to a set of Tools in Annexes (1.1 - 1.8) and (2.1 - 2.4) that provide further recommendations on key gender aspects in the process of NAPs/NIPs development.

Figure 6: The main steps in the process of developing national planning and policy strategy documents in chemicals management

[63] UNIDO. 2015. op. cit.

[64] Ibid

Element B1 Context analysis

Purpose

The purpose of this section is to provide guidance on:

- Recognizing gender dimensions in context analysis before starting the NAPs/NIPs development processes;
- The establishment of a gender-inclusive coordinating mechanism that will facilitate the context analysis as well as the rest of the steps in the development of national policies and strategies for chemicals management, i.e. policy planning process, strategy development and implementation.

Overall issues being addressed

The main issues being addressed in context analysis include:

- Legal, cultural and societal;
- Environmental and health protection;
- Labor and roles;
- Resources and access;
- Decision making;
- Political economy analysis.

Context analysis with a gender lens provides information on the risks and challenges to be anticipated in interventions rather than working from assumptions. It helps to unpack the gender dimensions in the chemicals management sector and informs how to best integrate them through the steps in the strategy-setting (refer to Fig. 3). The strategies should aim to address some of the gender challenges and enhance equality.

Key gender aspects

Key gender aspects in context analysis and setting up a coordinating mechanism are summarized below (further detailed examples are provided in Annex 1.1).

Legal, Cultural and Societal:

- Identify how policies, laws and regulations have affected the gender context.
- Determine if the legal frameworks are gender-neutral, blind or responsive.
- Examine the predominant norms and values for different social groups.
- Identify historical and current gender issues associated with the chemicals sector (mining, agriculture, waste, health, textile, cosmetics, toys, etc.).
- Identify barriers that impede women or men's engagement in the area of chemicals management.

Environmental and Health protection:

- Examine how policies, laws and regulations related to environment and health protection against chemicals related pollution affect and cover the gender context.

Labor and Roles:

- Examine the division of labor among women and men including household and caregiver roles.
- ***Access to resources and control over productive assets:*** Examine women and men's access to resources such as access and control of land, access to education, to financial services and to environmentally sound technologies.

Decision making:

- Examine women's ownership and management of organizations and enterprises and their participation in political and community spheres.
- Examine what structures exist at community, local and national levels to represent women.

Political Economy Analysis:

- Examine how power affects the position of different stakeholders and their ability to act
- Examine social, political and economic factors and their effect on the motivations and behaviors of women and men.

Establishment of a coordinating mechanism

- Ensure there is gender equality in the working group. For the technically relevant institutions, efforts should be made to have both women and men representatives.
- Make sure to include institutions concerned with women and children's issues such as the government bodies responsible for gender, women and children's affairs.
- Include both women and men in leadership roles in the coordinating mechanism i.e. working group.

Box 1: Case Study - Gender Gaps in Ethiopia's Artisanal Mining Sector[65]

Ethiopia has a sound legal framework. It has ratified the UN Convention on the Political Rights of Women and the Convention on Elimination of All Forms of Discrimination against Women. It has also endorsed the Sustainable Development Goals. The country has also adopted the principles of the Beijing Platform for Action and the African Charter on Human and Peoples' Rights. These commitments are supported by the Ethiopian Constitution which promotes equal participation of women and men in political, social and economic spheres of life and underpins the National Policy of Women. Several other policies and laws have been enacted or amended to increase women's minimum age for marriage to 18 years; afford women a share of assets following a dissolution of union; criminalize domestic violence, rape, female genital mutilation, abduction and early marriage; and create violence-free working environments.

Despite the sound legal framework for gender equality under the law, Ethiopia is facing challenges in terms of de facto gender equality. This is particularly the case for the ASM sector, even though Ethiopian government prioritized it as part of its national reform agenda and its commitment to develop the extractive sector through the Growth and Transformation Plan II (GTP II). The most salient gender issues identified include: women's lack of involvement in high-level positions in ASM groups; women's unequal participation in decision making and access to mining licences; women's exposure to environmental pollution; women's limited participation in community development activities and skills development initiatives; and gender stereotyping. In addition to those issues, limited accountability on gender mainstreaming hinders the effective integration of gender in all areas and all levels of the ASM sector. Gender-blind mining policies and laws have been identified as the key obstacles to the achievement of de facto gender equality in the ASM sector.

Element B2 Project design

Purpose

The purpose of this section is to provide guidance on integrating gender in the design of NAPs and NIPs projects and setting objectives for the different aspects of strategy development. It addresses the common gender barriers in project design when attempting to develop chemicals management projects that promote and benefit women and men equally.

Overall issues being addressed

The main issues being covered under project design include:

- Overall design of the project;
- Purpose and goal;
- Planning and activities ;
- Selection of beneficiaries and implementation areas;
- Elaboration of a results framework;
- Gender assessment.

Project design and objective setting facilitate the understanding of the development problem amongst stakeholders and role players. It leads to the articulation of the NAP/NIP, its purpose, intended outcomes and long-term impacts. The objectives and goals, and their respective targets

[65] Just Governance Group. 2019. "Dispatches". Multiples: December 2019, No. 28.

provide a framework for monitoring the progress of the implementation and evaluation. The NAP/NIP design should acknowledge the roles and needs of women and men and address gender inequalities to enable equal participation and contribution of women and men[66]. The strategies and measures developed for implementation should aim to reduce the negative impacts of chemicals on both women and men. Result statements do not have to mention gender explicitly, however gender equality dimensions must be reflected in objectives, indicators at both outcome and output level, in baselines, targets, means of verification, assumptions and risks, as well as in the project's theory of change.

Key gender aspects

The key gender aspects to be considered in project design for NAPs/NIPs include the following (please refer to Annex 1.2 for more detailed guidance; for guidance specific to NAPs refer to Annex 2.1):

Project Design

- Building the project design should include the findings of the gender context analysis.
- Ensure strong stakeholder engagement in design and analysis, including women groups and government departments responsible for women and gender.
- Determine the level of financial resources required for gender-responsive design, implementation, monitoring and evaluation activities.
- Determine the problem in which the gender perspective is reflected. For example, for an objective that is intended to address poor uptake of mercury-free or POPs-free technologies by occupational workers, a gender aspect to be considered might be the limited capacity of women to adopt these technologies because of low access to education.
- Use human rights frameworks or other industry guidelines to inform gender issues and ensuring women's rights in project design.

Project Purpose and Goal

- Ensure that the purpose and goals aspire to reduce inequality and give women equal rights to resources, ownership and control over such resources and productive assets.
- Set goals and "SMART" (Specific, Measurable, Achievable, Relevant and Time-bound) indicators, that consider the strategic needs of both women and men in host communities involved in chemicals management.
- The objectives and related targets should consider the gender dimensions of eliminating or reducing chemical use. For example, by including targets like the "reduction in the number of women burning mercury in the household", or "reducing the number of pregnant women in high-risk occupations within the industries and economic sectors exposed to POPs". All targets at outcome and outputs level should be gender-disaggregated.
- Women and men in communities are affected differently by chemicals management activities therefore the objectives and targets should reflect this.
- Objectives should ensure that gender equality is promoted through policy provisions such as by setting gender-balanced targets for the equal participation of women, empowerment initiatives benefiting the under-represented gender, etc.

Project Planning and Activities

- Seek gender parity while setting project management unit.
- Ensure a gender-balanced leadership and decision making in project planning and implementation, this includes technical teams in various government bodies tasked with developing and implementing the NAP/NIP.
- Align project activities with national and regional gender protocols which can be used as benchmarks.

[66] UNIDO. "Gender Mainstreaming the Project Cycle."

- Build capacity on gender issues among partners and beneficiaries.
- Develop and integrate mechanisms to ensure gender-balanced representation and women's participation in project activities.
- Capture the voices of women and men and develop gender-sensitive communication plans.

Selection of Beneficiaries and Implementation Areas

- Mainstream gender equality into the selection of beneficiaries to mitigate existing gender inequalities.
- Promote meaningful participation of different stakeholder groups especially women by fostering conditions that allow for open and unhindered expression of views.

Results Framework

- Elaborate impact, outcome and output statements with gender-specific language and content.
- Develop gender-specific targets or performance indicators that track gender results and impacts.

Gender Assessment

- Apply tools that assess if women and men have been included in the project design. Such tools include the Continuum Tool (presented below) and the UNEP Gender Marker (discussed in Element B8).

Box 2: The Gender Equality Continuum Tool[67]

The Gender Equality Continuum Tool helps project designers and implementers to integrate gender into programs and policies. It is useful as a Gender Assessment Tool as well. The tool guides program designers and implementers to move from "Gender Blind" to "Gender Aware" by examining gender considerations and adopting an approach along the Continuum. Gender Aware allows program staff to consciously address constraints and opportunities and plan gender objectives. The tool can be useful in assessing gender mainstreaming throughout the policy planning and strategy setting process, with the goal being to transform gender relations and promote equality.

Box 3: Examples of gender mainstreaming in project design

The Organization for Economic Cooperation and Development (OECD) issued guidance on applying a gender lens to due diligence and responsible mineral supply chains; this could be used to guide project design with regards to ensuring the rights of women throughout the supply chain[68]. The human rights framework (CEDAW)[69] or other human rights-based approaches are options for inclusion into project design as was done by the Mongolian Sustainable Artisanal Mining (SAM) Project[70].

[67] "Gender and SBCC Implementation Kit".

[68] OECD Secretariat. 2019. "Stakeholder Statement on Implementing Gender-Responsive Due Diligence and ensuring the human rights of women in Mineral Supply Chains. "

[69] Orozco, D and Parks, R. 2018. "Closing the Gender Gap in Extractives: What Has Been Done and What Have We Learned?". f

[70] Singo, P and Levin, E. 2016. "What Mongolia's artisanal miners are teaching us: The link between human rights and ASM formalisation".

Element B3 Stakeholder Engagement

Purpose

The purpose of this section is to provide guidance on gender mainstreaming in stakeholder mapping and involvement during the NAP/NIP development processes.

Overall issues being addressed

The main issues being considered in stakeholder mapping and involvement include:

1) Identifying the different stakeholders, the main stakeholders being:
    - Government entities;
    - Stakeholders active along the ASGM value chain, industries and economic sectors using and/or exposed to POPs;
    - Stakeholders providing services;
    - Academia and research entities;
    - NGOs;
    - Impacted communities.
2) Determining the roles stakeholders play in the chemical management landscape

Stakeholder mapping identifies and categorizes key stakeholders relevant to the chemicals management sectors by the interests they represent and the influence they have in inhibiting or supporting the planned objectives. Development of an engagement and communication plan is essential for the success of planned initiatives and managing expectations.

Awareness of gender dimensions in the engagement of stakeholders is essential to ensure equitable participation and involvement. Women's active engagement as stakeholders is often limited by traditional and cultural roles as well as women's domestic and economic roles. Restrictions in patriarchal societies do not allow women to have a voice in decision making, furthermore engagement efforts are often largely facilitated by men. A stakeholder engagement plan should mainstream approaches that overcome the related gender challenges and identify engagement approaches that allow for disadvantaged stakeholders to participate. Examples include determining the best way to communicate with women, engaging with women focus groups and the use of participatory techniques to capture gender specific information such as gender matrices, seasonal calendars, and community mappings[71]. For example, in social contexts where the status of women improves with age, elderly women are respected within their community and can better represent women's perspectives and voice their concerns.

Key gender aspects

The key gender aspects to be considered in stakeholder mapping and involvement for NAPs/NIPs include the following (please refer Annex 1.3 for more detailed guidance, for guidance specific to NAPs refer to Annex 2.2):

Government stakeholders

- Identify government entities responsible for women and gender at national and subnational levels;
- Identify women and men gender champions in relevant government institutions;
- Identify regional and international institutions safeguarding women's rights and equality;
- Ensure the stakeholder advisory group includes both women and men.

Stakeholders along chemical sectors value chains and other relevant economic sectors

- Ensure that the stakeholder profile is inclusive of women and people knowledgeable about gender issues.
- Identify the key actors in the chemicals sector, related industries and value chains as well as their gendered incentives, abilities and opportunities.
- Unpack what roles different genders play along value chains, within industries and across sectors exposed to mercury, POPs and other chemicals.
- Map how women and men are affected throughout the industries, economic

[71] Ezekiel, N. "Gender in Stakeholder Engagement".

sectors and value chains exposed to chemicals.

Stakeholders providing services

- Identify civil society and women support groups working on gender aspects.
- Identify private sector organizations providing services to women and men in the ASGM value chain, and across the industries sectors using and/or and exposed to POPs.
- Identify other actors in the baseline carrying out similar work on chemicals and gender that provide an opportunity for synergies and joint efforts.

Impacted communities

- Identify what gendered impacts have occurred amongst the most vulnerable social groups including indigenous people, downstream communities, women, youth, children, elderly, refugees, migrants, minorities and other communities most at risk.
- Ensure that there are gender-inclusive mechanisms adapted to the local context to encourage equal participation for both women and men, in terms of timing (hours of the day, season, etc.), language, as well as safe and enabling spaces for expression of ideas and opinions.

Academia and research entities and NGOs

- Identify NGOs, CBOs, and VIOs, and other CSOs working on gender aspects.
- Identify researchers and academia working on gender issues.
- Identify civil society influencers to support gender advocacy and outreach.
- Ensure stakeholders engagement mechanisms are inclusive of academic institutions working on gender and civil society groups engaged in gender-sensitive advocacy.

Element B4 Consultation

Purpose

The purpose of this section is to provide guidance on gender mainstreaming in consultations conducted during the development of NAPs and NIPs.

Overall issues being discussed

The main issues to be considered in stakeholder consultation include:

- The stakeholders to be engaged;
- The consultation processes;
- The results of the consultation.

Gender inclusive consultations cater for different stakeholders according to needs, roles, availability and contexts. The process ensures that women and men are well informed, actively participate and contribute in development processes. Activities in the field of chemicals management have different impacts on the environment, economic, social and health conditions of communities. While these impacts tend to disproportionately fall on women and children, consultation processes typically tend to overlook women's participation due to limitations arising from socio-cultural barriers and household roles. Gender-inclusive processes for the development of NAPs and NIPs should be adapted to the realities on the ground, considering the availability and constraints of both men and women stakeholders.

Key gender Aspects

The key gender aspects to be considered in stakeholder consultation during NAPs/NIPs include the following (please refer Annex 1. 5 for more detailed guidance; for guidance specific to NAPs refer to Annex 2.3):

Consultation stakeholders

- Ensure diversity of voices representing the different gender roles, levels of access to resources and decision making.
- Social groups and population sub-categories identified being most at risk from exposure to chemicals, following the following the information revealed by the baseline situation described taking into account the conclusions of data collection step, such as indigenous communities, occupational workers, women, youth and

children should be included to map out different gendered impacts.
- Engage with women associations and working groups.
- Ensure that women and gender champions in communities, government and the private sector are engaged in consultations.
- Engage other actors working on gender dimensions in chemicals management including civil society, international development and the private sector.

Consultation process

- Establish culturally appropriate engagement methods for each stakeholder group, for example in some cultures it may be appropriate to engage women and men separately
- Ensure the stakeholder consultation process is ongoing and iterative throughout the project cycle, starting as early as possible
- Develop terms of reference that are specific on gender mainstreaming to guide the consultation teams.
- Support dedicated community consultation to capture the voices of a wide range of community members to capture the views of affected people on various aspects.
- Take into consideration the constraints of women and men to attend consultations in terms of time, place and roles.

Result of Consultation

- Ensure that the views, objections and recommendations of both women and men stakeholders are duly considered to inform project development and implementation.
- Make sure that the gaps and challenges associated with gender dimensions are identified.

Box 4: Negative Impacts of Gender-Neutral Processes

In Ethiopia, compensation and resettlement processes, because of exploration activities are typically negotiated with male leaders, with women having little say on issues that directly affect them. This can include uprooting of crops for household consumption, disturbance to the family unit because of relocation and use of the compensation. This is an example of the negative impacts of gender-neutral processes during consultative processes that exclude the needs of women and vulnerable persons[72].

Box 5: Rethinking Gender in Waste Recycling project, Minas Gerais - Brazil

Women waste pickers in Latin America are facing multiple levels of daily discrimination while providing for their families. Therefore, voices are rising from women waste pickers to address gender division and relations within their value chain and bring gender issues to light within their organizations. In 2012, The National Movement of Waste Pickers in Brazil (MNCR), Women in Informal Employment: Globalizing and Organizing (WIEGO), the NGO INSEA, regional waste picker movement RedLacre, and the Center for Study and Research on Women (NEPEM/ UFMG) of the Federal University of Minas Gerais (UFMG) launched several meetings with women waste pickers from various cooperatives to contribute to the design of a pilot project in the state of Minas Gerais, Brazil.

[72] Just Governance Group. 2019. op. cit.

The participatory process helped identify the following points as priorities in terms of gender empowerment:

- The dissemination of survivors' stories to counter the impact of gender-based violence on women's self-esteem and their perceived ability to serve as leaders.
- Access to essential services such as day-care, legal counselling, and mental health care.
- Capacity building in terms of public speaking, governing and advocacy, and managing worker-owned cooperatives, will allow women to affirm themselves as leaders and actors of change in their communities and step into the leading position in the MNRC.

In 2013, as a result of this participatory process, Rethinking Gender in Waste Recycling project was implemented to address gender inequality present within women waste pickers' private and public spheres. The project was designed to provide them with the practical tools needed to challenge the gender hierarchies they face at present at home, at work, and as leaders within their representative organizations. Based on lessons learned, the project published several toolkits related to gender mainstreaming in the waste management sector namely Women Waste Pickers Toolkit and From Theory to Action: Gender and Waste Recycling: A Toolkit for Teachers, Researchers, and Practitioners. Also, as a result of the project, women waste pickers are mobilized more than ever and demand the mainstreaming of gender in the agenda of the national movement while maintaining strong ties with academia and research institutes, through the Women's Studies Research Center. Currently, a second phase is ongoing.

Element B5 Data Collection

During the process of data collection, special consideration should be given to sex and gender disaggregated data. By compiling and analysing such data, useful insights can be generated to better understand the different ways according to which the interplay between sex, gender and impacts associated with exposure to chemicals influences the distribution of the resulting burden at socio-economic, health, and environmental levels.

Purpose

The main purpose of this section is to provide guidance on mainstreaming gender during data collection in the NAPs and NIPs development processes.

Overall issues being discussed

The main issues to be considered in data collection include:

- Planning for data collection;
- The process of data collection;
- Type of data collected.

Gender disaggregated data collection is important in identifying and addressing barriers, realities and monitoring how gender is affected by chemicals management interventions. Gender disaggregated data unpacks the different needs, constraints and opportunities for beneficiaries. The data provides evidence on how a given intervention affects each group, development outcomes and opportunities to adapt the program towards the unique needs of women and men[73]. To better understand women and men's differentiated vulnerabilities to the multifaceted impacts of chemicals, it is very important to collect sex and gender disaggregated data.

Tools for data collection include literature reviews, expert observations, ethnographic observations, key informant interviews, focus group discussions, household surveys, assessments of Knowledge Attitudes and Practices (KAP), community and social mappings, seasonal calendars, informal interviews, life history and capturing of voices. Supporting the use of ICTs in the post-Covid-19 world can be of huge benefit to close the gender gap in the digital divide and empower the under-represented gender to be fully involved in all sorts of participatory processes to boost citizen engagement and leave no one behind.

[73] USAID. 2017. "Why it is Important to Sex-Disaggregate Data in Quality Improvement".

Key Gender Aspects

The key gender aspects to be considered in data collection during NAPs/NIPs development include the following (please refer Annex 1.4 for more detailed guidance; for guidance specific to NAPs refer to Annex 2.3):

Planning for Data Collection

- Define the role of sex and gender-disaggregated data collection in activities planning.
- Identify specific quotas to collect data about the under-represented gender (for example during household surveys, a quota of 30% could be assigned to women-headed households assuming that women are the under-represented gender, the same is valid in contexts where men are the under-represented gender)
- Identify communities targeted for data collection and categories of women and men in selected communities potentially impacted by the chemicals sector.
- Plan to collect data on women's roles and participation.
- Allocate adequate time for data collection to be able to get information on gender relations.
- Consider women and men's roles and their availability in planning for data collection.
- Formulate data collection tools to interrogate gender specific impacts, gaps and opportunities.
- Collect data through women and men actors within the value chains, industries and economic sectors using and/or exposed to chemicals and build their capacities to collect consistent and reliable data.
- Refer to Ministries of Gender/Women/Social Affairs, UN Agencies and NGOs as important sources of primary and secondary data.
- Ensure that there is gender expertise available to support data collection that captures the gender perspectives.
- Ensure a gender-balanced representation amongst informants and enumerators to encourage openness as women may be comfortable speaking with women.

Types of data collected

- Use sex and gender disaggregated secondary data from reliable sources.
- Collect a mix of qualitative and quantitative data.
- Collect seasonal and migration data at multiple points in time to accommodate migration patterns and often gendered seasonal participation driven by the seasonal needs of women.
- Integrate voices and life stories to help unpack evidence from quantitative data.

The Process of data collection

Box 6: Gender Mainstreaming in Data Collection

1. **Willingness of women to participate:** It is important to collect data in ways that shed light on women's willingness or even capacity to change. This is especially important considering changes that are perceived as detrimental to women's economic opportunities and livelihoods. For example, there is fear of being marginalized or earning less income among women miners in Zambia due to how the formalization promoted by the Africa Mining Vision (AMV) might change their operating environment[74].
2. **Seasonal participation** is often gendered, driven by the seasonal needs of women, e.g. in PNG women resort more to ASGM at the beginning of the school calendar to raise money for school fees[75]. It is also important to have **women only key informant interviews** to encourage

[74] Hilson G, Hilson A, Siwale A, Maconachie R. 2018. "Female Faces in Informal 'Spaces': Women and Artisanal and Small-scale Mining in sub-Saharan Africa". 2018. Africa Journal of Management, Volume 4, 2018 - Issue 3: Managing Africa's Informal Economy: Research, Practice and Advocacy

[75] Lynas, D. 2018. op. cit.

openness and conducting interviews with women associations and women working groups as was done in Papua New Guinea[76].

Gender-disaggregated data & Sex-disaggregated data

Sex-disaggregated data are data that are broken down by sex. However, gender-disaggregated data go well beyond sex-disaggregation to capture the specific and different socio-economic realities women and men face. Also, the existing gender concerns and differentials are taking into consideration when identifying the types of data to be collected and/or how data questions are formulated.

Element B6 Data validation

Purpose

The purpose of this section is to provide guidance on gender mainstreaming while validating the data collected during the processes of NAPs and NIPs development.

Overall issues being discussed

The main issues being considered during validation include:

- The stakeholders to be involved in the validation;
- The validation process (including the results).

Stakeholder validation in project development can be done through presenting findings and proposed interventions for stakeholders to confirm if their development narrative has been properly understood and elaborated. Participants should be adequately informed and provided with an environment that allows freedom to provide unbiased feedback.

Key Gender Aspects

The key gender aspects to be considered in validation for NAPs/NIPs include the following (please refer Annex 1.6 for more detailed guidance):

Validation Stakeholders

- Ensure the full participation of stakeholders, with special considerations for women.
- Ensure that women and men from communities impacted by chemicals management activities are fairly represented.
- Ensure that the policy makers responsible for women and gender issues and civil society organizations working on gender issues are involved.

Validation Process

- Develop strategies for dealing with obstacles hindering gender inclusivity during validation.
- Use participatory methods to encourage participation and feedback.
- Ensure that adequate time is allocated and that the venues suit both women and men's roles at work and home.
- Ensure that the process is inclusive and reaches out to different groups regardless of gender biased social norms or other identity markers.
- Harness the potential of ICTs to enable a wider and gender-balanced participation.
- Draw from lessons in the country and elsewhere on how to effectively engage women in validation of chemicals management strategies. Consider lessons from gender initiatives implemented in other sectors, particularly those that may have a link with chemicals management.

Element B7 Priority Setting

[76] Javia, I and Siop, P. 2010. "Paper on Challenges and Achievements on Small scale mining and Gender. Papua New Guinea".

Purpose

In this section, we will provide useful guidance to mainstream gender aspects in the prioritization of NIPs and NAPs interventions and the formulation of action plans.

Overall issues being discussed

- The gender-differentiated footprint of chemicals remains mostly invisible due to the scarcity of sex and gender-disaggregated data, therefore gender issues may not be seen as priorities.
- Some of the social groups most affected by the impacts associated with exposure to mercury and POPs, tend to be overlooked and may not necessarily benefit from early interventions.

Once the required information and data are collected and validated, countries need to prioritize the interventions included in their NIPs and NAPs to develop their Action Plans. Considering all sorts of limitations facing effective implementation of chemicals management interventions, be it financial, technical, institutional, or technological, there is a need to prioritize what needs to be done first and to which the available budget and resources should be allocated. By triangulating factors such as the urgency of the issue, the scale of its impacts, and the cost of inaction such priorities can be identified. While doing so, gender issues should not be overlooked. By mainstreaming gender considerations into the previous steps of the NIPS and NAPs development processes, at this stage, a clear picture should be available to set up priority interventions based on sex and gender-disaggregated data. In situations where such data is not available, it is hard to translate the assessments of impacts associated with exposure to mercury and POPs into gender-informed decisions that prioritize disproportionately affected social groups and those populations most at risk.

Key gender aspects

- Develop multi-dimensional impact assessments based on the feedback loop featuring the complex interactions between sex, gender, exposure, vulnerabilities, and adaptive capacities to identify optimized solutions for enhanced resilience and tackle the social, economic, and ecological outcomes resulting from the exposure to mercury and POPs.
- Assess not only costs related to chemicals-related poisoning and sickness but also costs related to maternal health and the costs associated with the invisible health burden passed on to the future generations.
- Prioritize interventions in areas where the cost of inaction is higher.
- Prioritize interventions benefiting those social groups most at risk including women, children, and vulnerable subpopulation categories such as refugees and people living below the poverty line.

Element B8 Resource allocation and gender-sensitive budgeting

Purpose

The purpose of this section is to provide guidance on gender mainstreaming in resource allocation during the development of the NAP/NIP. It provides suggestions on key gender issues to consider in resource allocation and gender-sensitive budgeting.

Overall issues being addressed

The main issues being addressed in resource allocation are concerned with:

- Resource allocation planning;
- Enhancing women's participation;
- Ensuring women's access and influence.

Allocation of resources for the different interventions embedded in NAPs and NIPs should not exacerbate existing gender inequalities, patterns of marginalization and exclusion of women. Adequate resources should be earmarked to support mainstreaming gender in the various strategies, implementation of activities and measurement of results. Gender-responsive resource allocation includes provision for full participation of women throughout policy planning and strategy setting, gender institutional capacity

building, technical training and access to equipment for women, gender capacity building amongst stakeholders and tools for inclusion of disadvantaged groups such as translation and visual materials. Resource allocation demonstrates a commitment to implementing gender-focused initiatives. From a gender perspective, questions such as "how do we overcome budget constraints?" and "which approaches to ensure that sufficient financial resources are allocated in a gender-sensitive way for the design and implementation of NIPs and NAPs?" should be given due consideration using gender-sensitive-budgeting measures that could be reflected for instance in the draft guidance for NIPs on the calculation of action plan costs, including incremental costs and action plans for specific POPs.

Key gender aspects

The key gender aspects to be considered in resource allocation for NAPs and NIPs include the following (please refer Annex 1.7 for more detailed guidance; for guidance specific to NAPs refer to Annex 2.4):

Planning for resource allocation

- Identify priorities for resource allocation to advance gender mainstreaming while making sure that resource allocation does not exacerbate gender inequality.
- Identify institutional gender capacity gaps and allocate resources to address them.
- Allocate specific resources to gather and analyze sex and gender disaggregated data.
- Evaluate the need for resources for policy and regulatory review.
- Allocate resources for M&E to measure gendered impacts of the interventions.

Enhancing women's participation

- Allocate resources for activities that improve women's status and diversification of their activities.
- Allocate resources to provide daycare support for women who have their children while working.
- Budget for equitable participation of women in meetings, considering their home care roles.

Ensuring women' access and influence

- Allocate financial and human resources to enable women and men to access productive assets and services, such as fair markets, finances, technical skills and technology, education and training.
- Use gender-sensitive budgeting to allow women and men to mobilize into interest groups, mainstream women advocacy efforts and create opportunities for influencing women's mobilization and collective action locally, nationally and regionally.

Box 7: Examples of prioritizing women's interventions in resource allocation

The Mthandazo Women's Mining Centre—the first exclusively women owned mining centre in Zimbabwe—has 34 members. Located in Gwanda District of Matebeleland South Province in Zimbabwe, the Centre received mining equipment from the UNDP in partnership with the Ministry of Women Affairs, Gender and Community Development.

The Centre includes a mini-gold processing plant, smelting facility and brings together women miners, most of whom are engaged in mining operations, providing employment to scores of people. It enables the women to benefit from reduced rates as they own the facility. It addition, the women share profits and benefit from the residual gold recovered from processed sands.

> Through the Centre, the women are able to network, share their experiences, access gold markets and improve their mining operations[77].

Box 8. Case Study – GEF's interventions to finance POPs-free development pathways

SIDS and LDCs received about 35% of the total resources programmed by the GEF to implement the Stockholm Convention over the 2014-2018 period under its 6th replenishment cycle (GEF, 2019). Under GEF-7, the SIDS/LDC program uses a flexible approach to co-financing and supports public-private partnerships to pursue sustainable low and chemicals-free development strategies. Homegrown and locally appropriate solutions are encouraged in different areas such as to ensure cleaner health care waste management, address e-waste through life cycle management, and promote best available techniques and environmental practices to reduce UPOPs releases (GEF, 2019). The GEF also focuses on gender mainstreaming in line with its gender policy following a "do-good" instead of a "no-harm" approach. In a recent evaluation, out of 57 projects in the chemicals and waste focal area, 29 were rated as gender-sensitive, 27 as gender-aware and one project as gender mainstreamed. No projects were found to be gender blind, nor gender-transformative (GEFIEO, 2018). Another interesting finding is that multi-focal area projects tend to outperform single focal area projects in terms of their gender responsiveness, which confirms that better gender mainstreaming results could be achieved using integrated approaches in the gender-environment nexus.

According to the performance of project funded by the GEF under the C&W Focal Area in GEF-6, while gender aspects are mainstreamed into projects design and interventions, the available results so far suggest that with regards to advancing gender equality, chemicals management projects are trapped in the middle and that more efforts are needed to deliver transformative gender outcomes. While we emphasize that more is needed, we should also be aware that prevailing gender norms can only be challenged in the long run one step at a time. Gender mainstreaming tools into chemicals management such us these guidelines should be adopted on a step-by-step approach. The gender mainstreaming process in chemicals management should be user-friendly and not overwhelming not to discourage users from putting it into good use.

Element B9 Monitoring, and Evaluation

Purpose

The purpose of this section of the guide is to provide guidance on key gender aspects in the process of planning and implementing M&E frameworks in NIP and NAP projects.

Overall issues being addressed

The main issues being addressed in M&E include:

- The hierarchy of M&E as follows:
    - Mid-Term Reviews and Final project evaluations as part of the implementation process are done by the entity accountable for implementation and in charge of reporting to the line government authority and the national coordinating group.
    - Internal reviews of specific projects and aspects of the NAP/NIP by line government authorities as part of their oversight role which can be used for reporting to the national coordinating group.
    - External evaluation of the whole NAPs/NIPs by an independent entity, to be used by the national coordinating body to report to the

[77] UNDP. "Women empowerment: Mining a fortune".

highest responsible authority in the country. The authorities can in turn use this for reporting as required by the relevant UN convention.

- A recommended M&E approach, which is the use of a logical framework (logframe) with the following features:
    - Impacts - which set out the high-level objectives of the NAPs/NIPs to indicate the desired long-term impacts of the project.
    - Outcomes - which set out the mid-level objectives of the NAPs/NIPs to indicate the outcomes desired to be achieved as a direct result of its outputs during the life of the project.
    - Outputs - which set out the short-term objectives of the NAPs/NIPs to indicate the outputs desired to be achieved as a direct result of its inputs in the short-term.
    - Inputs - which are the resources put towards each element of the NAPs/NIPs and will allow donors and investors to determine the return on investment (therefore able to adapt resource allocation and priorities).
    - Indicators - These are set for impacts, outcomes, and outputs to show that progress is being made towards the objectives of the NAP/NIP.

The questions to focus on at this stage of the NIPs and NAPs development processes include the following: "which gender considerations to focus on during the process of reporting, monitoring, and evaluation?" and "what are the tools and resources that can be used to build gender-responsive M&E plans during the design of NIPs?".

Gender aspects should be integrated in the results framework to measure the progress achieved and identify potential bottlenecks hindering the project from achieving its results. The gendered M&E frameworks allow for the collection of information on progress, challenges, and lessons learned which could be used to inform the design of future projects and interventions. It also allows for internal learning, which facilitates informed adjustments that can lead the project to achieving its goals.

Sex and gender-disaggregated result measurements provide evidence on how women and men have been impacted in the development and implementation of NAPs and NIPs. Using sex disaggregated data, high level impact reporting can be linked to the Sustainable Development Goals (This is not only related to SDG 5 on Gender Equality and Empowerment of Women and Girls, but also to the other SDGs considering that gender mainstreaming is the glue to cement the interlinkages between the SDGs and remains essential to delivering the 2030 agenda.).

Key gender aspects

The key gender aspects to be considered in developing an M&E framework for NAPs/NIPs projects include the following (please refer Annex 1.8 for more detailed guidance; for guidance specific to NAPs refer to Annex 2.4):

- The M&E framework should have clear outcomes and outputs to evaluate and monitor all gender targets for gender equality and inclusivity.
- Use of gender tracking tools such as the UNEP Gender Marker to assess gender mainstreaming in the results framework is encouraged. The gender marker is a coding system that determines how well gender is incorporated into a project with respect to the context, implementation logframe and budget (refer to Figure 4)[78].
- A participatory approach to M&E with fair representation of men and women should be considered.
- The M&E framework should consider important issues that determine how

[78] Tsang, V. 2016. "Gender Marker Two-Pager Series (1) The Basics: All you need to know about the Gender Marker". Prepared by UNEP Gender & Safeguards Unit, 12 September 2016.

women participate in chemicals management.
- The monitoring plan should demonstrate how the data for gender targets will be collected. All data should be disaggregated by sex and gender to measure the results and impacts on women and men.
- Results from the M&E should inform if and how the beneficiaries have been impacted by the intervention, and this should be presented in a gendered way.
- Both women and men involved in chemicals management across relevant sectors should be engaged to participate in the M&E process.

Figure 5: Coding matrix for the UNEP Gender Marker (adapted from the UNEP Gender Marker Guidelines)[79]

Code	Meaning	Criteria
0	Gender-blind	Gender relevance is evident but not at all reflected in the project document.
1	Gender partially mainstreamed	Gender is reflected in the context, implementation, logframe, **OR** the budget.
2a	Gender well mainstreamed	Gender is reflected in the context, implementation, logframe, **AND** the budget.
2b	Targeted action on gender	The principle purpose of the project is to advance gender equality.
N/A	Not applicable	A gender analysis reveals that the project does not have direct interactions with and/or impacts on people, therefore, gender is considered not applicable.

Box 9: Examples of Gender Mainstreaming in Monitoring and Evaluation

1. Innovative approaches to mainstreaming gender in M&E
   In the DRC, the NGO IMPACT implemented an M&E system, in the ASGM sector, that measures impact on women's empowerment, peace and security using indexes such as the Women, Peace and Security Index and the SGDs. (See IMPACT Webinar)

2. Promoting gender mainstreaming in M&E in Ethiopia
   In order to promote gender equality and women's empowerment in the ASM sector, the Ministry of Mines and Petroleum (MoMP) has taken very concrete actions to incorporate gender equality considerations in indicators, implementation plans, and monitoring and evaluation across the ASM sector and the GTP II in general. Several interventions have been started, including strengthening of MoMP gender competence around legal and policy frameworks, building gender capacity and understanding among key MoMP decision-makers and parliamentarians, and promoting women groups engagement in policy and legal reviews[80].

[79] Figure 5 from UNEP Gender marker. Tsang. 2016. op. cit.
[80] Just Governance Group. 2019. op. cit.

Element B10 Knowledge Management

Purpose

In this section, we will provide useful guidance to develop gender-sensitive Knowledge Management (KM) strategies and platforms to disseminate best practices and lessons learned related to mainstreaming gender into the sound management of chemicals through the case of mercury and POPs.

Overall issues being discussed

- There is very little data about how sex and gender considerations shifting the tide of the burden associated with exposure to chemicals.
- Despite multiple initiatives being undertaken around the world to mainstream gender into chemicals management, these tend to operate in silos and their findings are not necessarily accessible to build a knowledge base in other contexts.
- Even in situations where data and knowledge do exist, financial and connectivity challenges make it difficult to engage and communicate with meaningful stakeholders to adopt best practices into local realities.

Considering the lack of data at the gender and chemicals nexus, it is of critical importance that countries build on the growing body of knowledge to extract lessons learned and capitalize on good practices and international benchmarks with regards to mainstreaming gender into the design and development of policies, strategy documents and action plans in the area of chemicals management, such as NAPs and NIPs. By breaking silos and working across borders through south-south and triangular cooperation schemes, by leveraging the expertise and resources of the private sector through public-private partnerships, there is just so many countries can do to engage in a steady learning curve as efforts are being deployed worldwide to bridge the gender knowledge gap in the field of chemicals management. Such a technical field being often portrayed as complex, the underlying gender dynamics, the entry points for gender mainstreaming, and the disproportionate burden unevenly falling on those already suffering from gender inequalities are yet to be fully explored.

Key gender aspects

- Develop KM platforms that connect a wide spectrum of stakeholders and covers the numerous industries, economic sectors, and value chains using chemicals and communities being impacted by chemicals.
- Develop communities of practices to disseminate state of the art tools for gender mainstreaming into chemicals management such as gender-sensitive budgeting guidelines for NIPs and NAPs, gender-sensitive research protocols for environmental health assessments, gender-informed costs of inaction, etc.
- Facilitate context-specific learning platforms on gender and chemicals using ICTs for a broader reach and lower costs using webinars, broadcasts, online caravans, etc.

Box 10. Case study – SAICM Knowledge Portal

Funded by the GEF through the "Global Best Practices on Emerging Chemical Policy Issues of Concern" project implemented by UNEP, this knowledge platform is a repository of resources that aims to connect people working for a safer environment while at the same time being a go-to-space for information and events related to chemicals. Users of the platform can explore a wide array of topics to bridge the knowledge gaps on chemicals with regard to aspects such as the SDGs, gender mainstreaming, and circular economy. The platform also enables stakeholders at local, national, regional, and global levels to create and share knowledge, and experiment with pilot solutions such as the Quick Start Programme (QSP).

With regards to gender mainstreaming, for example, the QSP project conducted a survey of dangerous practices including children's and women's exposure to chemicals in tea and coffee plantations in Uganda, as a result, a policy brief was developed for the minister of gender, labor, and social development on "inventory of dangerous chemicals, processes and endpoint discharges". In Rwanda's northern and western agricultural regions, where women accounted for about 80% of pesticide application defeating the common perception that this was a men's job, the project delivered farm training targeting pesticide users was largely attended by women. In Argentina, the project provided advice on chemical safety to mothers and (indirectly) to their children (SAICM, 2015).

The platform is executed by the Secretariat of the Strategic Approach for International Chemicals Management known as SAICM. It enables a wide spectrum of stakeholders to join forces for cooperative risk reduction interventions on a number of emerging policy issues in contribution to SDG 12. These include a large scope of chemicals encompassing global contaminants such as POPs and mercury along globalized value chains and international waters such as chemicals in products, lead in paint, hazardous substances in the life cycle of electronics and electronic products, highly hazardous pesticides, endocrine-disrupting chemicals, environmentally persistent pharmaceutical products, and nanotechnologies and manufactured nanomaterials.

Section C - Gender Dimensions of Action Plans in the context of chemicals management

The gender dimensions of developing strategies for chemicals management, for example through NAPs and NIPs, can be considered from both a process perspective and a content perspective. Section B described in detail the general considerations for the process of developing strategies. This section provides guidance on the gender dimensions of strategic content of NAPs (refer to Subsection C1) and NIPs (refer to Subsection C2).

Gendered questions to be asked

- ✓ In selecting entities and individuals to participate in the formulation and implementation of strategies (including at leadership level), has gender parity been considered?
- ✓ What areas should be covered, and are they gender inclusive?
- ✓ How is the participation of women ensured and is it equitably resourced?
- ✓ Is there baseline data and is it disaggregated by sex, gender and other vulnerable groups?

Sub Section C1 Gender dimension of strategic content of NAPs

This section of the Guide supports gender mainstreaming in the development of NAPs in accordance with the provisions of the Minamata Convention. This guidance builds on and should be used in conjunction with the UNEP *"Guidance Document - Developing a National Action Plan to Reduce and, Where Feasible, Eliminate Mercury Use in Artisanal and Small-Scale Gold Mining"*[81]. This Guide also cross-references the following:

- *The UNEP Gender Marker*[82];
- *Estimating Mercury Use and Documenting Practices in Artisanal and Small-scale Gold Mining (ASGM)*[83];
- UNEP and UNITAR *Handbook for Developing National ASGM Formalization Strategies within National Action Plans)*[84];
- UNITAR *Socio-economic ASGM Research Methodology*[85].

The section is organised into four areas of focus for NAP development, namely:

- Policy, regulation, and institutional frameworks;
- Technical and environmental aspects;
- Health aspects;
- Socio-economic aspects.

These areas of focus are aligned to the provisions of Annex C of the Minamata Convention by encompassing and detailing the strategies recommended by Annex C for development of a NAP to guide the reduction of mercury emissions and releases from ASGM into the environment[86] (refer to Table 3). The strategies target specific challenges related to ASGM and mercury emissions and releases.

Table 6: The strategies from Annex C of the Minamata Convention mapped by the areas of focus to be covered by the NAPs

NAP area of focus	Relevant NAP strategies (based on requirements outlined in the Annex C of Minamata Convention)
Policy, regulation, and institutional frameworks	✔ Facilitation of ASGM formalisation by having the appropriate policies and legal instruments ✔ Management of mercury trade to limit its diversion to use by ASGM ✔ Involvement of stakeholders in the NAP implementation process ✔ Development of institutions with the appropriate soft and hard infrastructural arrangements to support mercury reduction
Technical and environmental aspects	✔ Strategies for the reduction of mercury emissions and releases from ASGM ✔ Identifying and promoting the use of mercury free processing technologies ✔ Development and dissemination of improved occupational health and safety practices ✔ Improvements in mechanisation for more efficient and viable ASGM operations ✔ Development of trainings to improve the skills of miners and capacity building in the use of newly introduced processing methods

[81] 81 UNEP. 2017. Guidance Document: Developing a National Action Plan to Reduce and, Where Feasible, Eliminate Mercury Use in Artisanal and Small-Scale Gold Mining

[82] Tsang. 2016. op. cit.

[83] O'Neill, J. D. and Telmer, K. 2017. Estimating Mercury Use and Documenting Practices in Artisanal and Small-scale Gold Mining (ASGM). Geneva, Switzerland: UN Environment

[84] UNITAR and UNEP. 2018. Handbook for Developing National ASGM Formalization Strategies within National Action Plans. UNITAR & UN Environment, Geneva

[85] UNITAR, 2018. Socio-economic ASGM Research Methodology

[86] Minamata Convention op. cit.

	✔ Dissemination of information on the business case (and other benefits) for more efficient processing technologies
Health aspects	✔ Reducing the exposure of ASGM miners and communities to mercury ✔ Gathering of health data to monitor impacts of mercury on miners and communities ✔ Training of health care workers to improve service delivery to miners and host communities ✔ Development of programs to raise awareness about the health impacts of mercury and limiting exposure
Socio-economic aspects	✔ Prevention of exposure to mercury of vulnerable populations, particularly children and women ✔ Provision of information to ASGM miners and affected communities ✔ Building the resilience of miners and host communities to economic shocks (e.g. the COVID-19 pandemic)[87] ✔ Strategies for accessing finance and alternative livelihood strategies

This section (i.e. Elements C1.1-C1.4) provides examples of key gender aspects that should be considered in developing strategies and interventions to address the relevant ASGM challenges. Please refer to Annex 2, which contains accompanying tools and checklists for each strategy.

Element C1.1 Policy, regulatory and institutional frameworks

Purpose

The purpose of this section is to provide key gender aspects for the following strategies:

a. Facilitation of ASGM formalisation by having the appropriate policies and legal instruments;
b. Management of mercury trade to limit its diversion to use by ASGM;
c. Involvement of stakeholders in the NAP implementation process;
d. Development of institutions with the appropriate soft and hard infrastructural arrangements to support mercury reduction.

The sub-elements below (i.e. Sub-element C1.1.1-C1.1.4) provide specific examples of the challenges being addressed by the strategies, and examples of the key gender aspects to be considered in addressing these challenges (refer to Annex 2.5 for more details on the challenges and examples of key gender aspects).

Sub-element C1.1.1 Facilitation of ASGM formalisation through appropriate policies and legal instruments

Challenges to be addressed

Some of the challenges being addressed by formalising the ASGM sector include:

- Lack of institutions with the appropriate soft and hard infrastructural arrangements to support mercury reduction. This is sometimes reflected in the limited involvement of the local authorities in management of the ASGM sector;
- Informal operations of the ASGM sector, some with criminality involved;
- Lack of unambiguous and appropriate legal provision, which might be contributing to limited access to resources.

Key gender aspects

[87] The COVID-19 pandemic, also known as the coronavirus pandemic, is an ongoing pandemic of coronavirus disease 2019 (COVID-19), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Learn more here.

The key gender aspects to be considered in the initiatives and interventions facilitating ASGM formalisation include:

- Ensure that the capacity building of institutional frameworks (including local authorities) includes gender competencies and caters for inclusivity. This will enable delivery of technical assistance in ways that address the issue of women having lower levels of literacy.
- Ensure that women and men are involved in the development of adequate policies, regulations and programs on understanding environmental hazards and how to prevent them. Women's associations and women groups could support the involvement of women. This guarantees that both the practical (i.e. addressing immediate requirements) as well strategic (i.e. for systemic change) needs of women and men are addressed.
- Consider policy level targets for equal participation of men and women, supported by appropriate policy and regulatory provisions and programmes. This should include issues of property rights for both women and men, and facilitating fair access to minerals through mining rights application procedures that respond to women's needs, like lower levels of education etc.
- Align strategies with relevant national policies and legal instruments on gender equality and women's empowerment, as well as with regional and international protocols on gender to ensure good practices.

Sub-element C1.1.2 - Management of mercury trade to limit diversion to ASGM

Challenges to be addressed

Some of the challenges to be addressed when trying to manage mercury trade so that mercury is not diverted to ASGM include:

- Illegal mercury supply/trade, sometimes associated with strong criminal syndicates;
- Inadequate legal framework to address the poor management of mercury;
- Mercury availability through regional flows, resulting from poor regional cross-boundary collaboration.

Key gender aspects

The key gender aspects to be considered in addressing the challenge of mercury being diverted to ASGM include ensuring that:

- Consider interventions to protect vulnerable women from being exploited by mercury traders. For example, women may be caught in debt traps that result in them depending on mercury traders for inputs on credit in exchange for the gold produced, resulting in them not getting a fair price for their gold.
- By designing legal provisions take into account the experiences of both women and men by consulting them during the development of policy and legal frameworks for mercury management. This should include aspects of cross-border collaborations to address illicit flows of mercury.

Sub-element C1.1.3 Stakeholder involvement in NAP implementation

Challenges to be addressed

Some of the challenges faced in trying to involve stakeholders in the NAP implementation process include:

- Existing communication gaps between the ASGM community and key institutions. This may be due to the limited organisation and informality of the ASGM sector, hence there is no platform for broad and inclusive engagement.
- Inadequate capacity in regulatory and support institutions; one of the impacts being poor involvement of downstream and indigenous communities affected by ASGM operations.

Key gender aspects

The key gender aspects to consider in stakeholder involvement in the implementation of NAPs include:

- Consider interventions that support capacity building of good governance in

women's organisations to give them a voice. This will improve their capacity to advocate for their needs, for example in accessing training and information, which could be done through establishing communication channels dedicated to women.

- The national NAP coordination group should provide a safe space for women to voice their opinions and enhance capacity. This may mean having a gender subcommittee through which issues of gender are coordinated for the NAP process, and the women miners associations should be a part of that committee.

Box 11: Policy and legal provisions for formalization

- ✓ Flexible formalization approaches: **Mongolia has three forms of formalization** that cater for the different capacities of ASM actors[88].
- ✓ Strategies should try to align with **regional and global protocols;** for instance, the *Protocol to the African Charter on Human and Peoples' Rights on the Rights of Women in Africa* and international protocols like *The Convention on the Elimination of All Forms of Discrimination against Women (CEDAW)*[89].

Box 12: Tanzanian Women in Extractives

Women's voices

In open letters to political leaders, the **Tanzania Women in Extractives** expressed their wishes. This included: being consulted, wanting to participate in mining, getting fair prices for their minerals, capacity building, being respected and not being subjected to gender-based violence, access to social infrastructure, self-determination and demanding their rights. See:

- https://womeninminingtz.blogspot.com/search/label/Women%20Quotes
- https://womeninminingtz.blogspot.com/search/label/Women%20Stories

Box 13: Legal frameworks marginalising women in formalisation

In Ghana, **women comprise 15 percent of the legal and 50 percent of the illegal artisanal mining workforce**. They are **disproportionately disadvantaged by the existing legal framework**. The laws, policies and reforms that govern a formalized artisanal mining sector should be gender-sensitive, consider the needs and interests of women, and recognize their vulnerabilities in the sector. This will ultimately enhance the monitoring of human and gender rights in the sector, particularly with reference to sexual abuse, violence, and women's health issues[90].

[88] Singo, P and Levin, E. 2016. op. cit.
[89] Convention on the Elimination of All Forms of Discrimination against Women.
[90] Eshun, M. 2016. "Not Just Counting Their Numbers, But Making Women Artisanal Miners Count".

Element C1.2 Technical and environmental aspects

Purpose

The purpose of this section is to provide key gender aspects for the following:

a. Strategies for the reduction of mercury emissions and releases from ASGM;
b. Identifying and promoting the use of mercury free processing technologies;
c. Development and dissemination of improved occupational health and safety (OHS) practices;
d. Development of trainings to improve the skills of miners and their capacity building in the use of appropriate technologies;
e. Improvements in mechanisation for more efficient and viable ASGM operations;
f. Dissemination of information on the business case for more efficient processing technologies;

The sub-elements below (i.e. Sub-element C1.2.1-C1.2.6) provide specific examples of the challenges being addressed by the strategies, and examples of the key gender aspects to be considered in addressing these challenges (refer to Annex 2.6 for more details on the challenges and examples of key gender aspects).

Sub-element C1.2.1 Strategies for reduction of mercury emissions and releases from ASGM

Challenges to be addressed

Some of the challenges that need to be considered in developing and implementing strategies for the reduction of mercury emissions and releases include:

- Prevalent and unregulated use of mercury use in processing gold with mercury, which results in widespread emissions and releases to the environment;
- Poor mercury use practices in gold processing with mercury in the ASGM sector, including the worst practices e.g. whole ore amalgamation, open amalgam burning, burning amalgam in and near homes/residential areas, and cyanidation of mercury-containing tailings.

Key gender aspects

The key gender aspects to consider in initiatives to reduce mercury emissions and releases from ASGM include the following:

- Ensure that both women and men participate fully in activities to reduce mercury emissions and releases. For example, ensure equal access to equipment and training on mercury free methods.
- With respect to eliminating the worst practices, ensure that both women and men receive the correct training suited to adaptation of methods for responsible mercury use.

Sub-element C1.2.2 Identification and promotion of mercury free processing technologies

Challenges to be addressed

In identifying and promoting mercury free processing technologies the following challenges should be addressed:

- Limited availability of mercury free processing methods and equipment;
- Limited knowledge and skills on using mercury free processing methods and the benefits;
- Pressure from mercury suppliers to continue to use mercury.

Key gender aspects

It is important to consider the following gender aspects when identifying and promoting mercury free technologies:

- Implement capacity building interventions in local institutions to research mercury free processing methods that are easily adopted by women and men in ASGM. This should be supported by training programs to improve the skills of both women and men in using these methods;
- Promote greater use of mercury-free technologies, by ensuring that women are made aware of the improved efficiencies of new processing methods which can result in better gold recoveries and higher grades, thus increasing their incomes.

Having access to finance initiatives targeting women will support them to transition to mercury free techniques, reducing their dependence on the credit provided by mercury dealers and other predatory financiers.

Sub-element C1.2.3 Development and dissemination of improved OHS practices

Challenges to be addressed

Examples of challenges that need to be addressed in developing and disseminating improved OHS practices include:

- Poor occupational, safety and health standards at ASGM sites.
- Limited understanding by responsible authorities, of the relevant OHS hazards, including those presented by mercury.

Key gender aspects

Development and dissemination of improved OHS practices need to consider the following key gender aspects:

- Consider the needs of both men and women in upgrading OHS practices. This should also consider the special needs of women, for example, personal protective equipment (e.g. one piece overalls are not suited to women).
- Have interventions that target the roles that specifically involve women as these may be overlooked. For example, women are known to burn mercury amalgam in the home, it is therefore important to understand how and why this happens and develop specific messages to raise their awareness about the health hazards.

Sub-element C1.2.4 Development of trainings to improve miner's skills and capacity in using appropriate technologies

Challenges to be addressed

Some of the challenges being addressed by developing training programs to improve the skills of miners in applying new technologies include:

- Limited skills to use mercury-free technologies;
- Lack of incentives for miners to change to mercury free technologies, which contributes to low uptake of the technologies.

Key gender aspects

In trying to improve the skills of miners to use appropriate mercury free technologies, a key gender consideration is the needs of both men and women in the mechanized processing facilities and the introduction of mercury free methods. This should consider gender sensitivity, disincentives and incentives for behaviour change. For example, improved incomes and equal access to mineral deposits and productive assets for women would be an incentive to adopt new mercury-free technologies.

Sub-element C1.2.5 Improvements in mechanisation for efficient and viable ASGM operations

Challenges to be addressed

In improving mechanisation for efficient and viable ASGM operations, the following challenges will need to be addressed:

- Limited access to equipment, which may be due to limited finances for the acquisition of equipment.
- Limited knowledge and skills to use mechanical equipment.

Key gender aspects

The key gender aspects to consider when trying to improve efficiency and viability of ASGM through mechanisation include:

- Ensure that options for technical advancement are accompanied by financing solutions accessible to both women and men. For example, consider hire purchase schemes with concessionary interest rates, centralised processing facilities, and supporting savings clubs for equipment buying.
- Build the capacity of both men and women to operate equipment. Training programs should be structured for the appropriate levels of education, and the scheduling should consider the needs of women, e.g. caregiving etc.

- Build the capacity of women and men in financial management of their ASGM operations.

Sub-element C1.2.6 Dissemination of information on efficient processing technologies

Challenges to be addressed

Some of the challenges that dissemination of information on efficient processing technologies is trying to address include:

- Lack of incentives for miners to change to mercury free technologies.
- Limited capacity of responsible authorities and other stakeholders to promote efficient processing technologies. These stakeholders may not have the knowledge or finances to develop and implement awareness raising programs.

Key gender aspects

In addressing the challenges associated with disseminating information on mercury free technologies, the following key gender aspects should be considered:

- Ensure that the needs of both women and men are considered in designing incentives to transition to mercury-free methods. This may include security interventions to protect women from mercury dealers and getting them out of debt and bondage traps.
- Provide relevant authorities and stakeholders with 'train-the-trainer' programs tailored for both women and men miners. This will build their capacity to promote efficient technologies and advocate for the business case. They will also be able to support capacity building of both women and men miners so that they are fully capable to manage or administer newly formed mining associations, cooperatives etc. These organisations may be needed to support the formalization process, which is at the core of the mercury reduction approaches.

Box 14: Lack of recognition of women miners and not being consulted

Women's voices

Women gold miners in PNG highlight the need to be recognised:

"...We have been neglected for a long time, even our parents were neglected. It is only now we are being recognised and recently there has been some change. We need to be recognised, I have had enough of working in rivers ... if I could do something else ... or if there was machinery we could use to help us so we don't need to work so hard, I could keep going..."[91]

Element C1.3 Health aspects

Purpose

The purpose of this section is to provide key gender aspects for the following:

a. Reducing the exposure of ASGM miners and communities to mercury;
b. Developing a public health strategy including the gathering of health data on the impacts on miners and communities;
c. Training of health care workers to improve service delivery to miners and host communities;

[91] Lynas, D. 2018. op. cit.

d. Developing programs to raise awareness about the health impacts of mercury and limit exposure.

The sub-elements below (i.e. Sub-element C1.3.1-C1.3.4) provide specific examples of the challenges being addressed by the strategy and examples of the key gender aspects to be considered in addressing these challenges (refer to Annex 2.7 for more details on the challenges and examples of key gender aspects).

Sub-element C1.3.1 Reducing exposure of ASGM miners and communities to mercury

Challenges to be addressed

Some of the challenges related to reducing the exposure of ASGM miners and communities to mercury include:

- Worst practices in mercury use, for example open burning of amalgam, burning amalgam in and near homes/residential areas, whole ore amalgamation, and cyanide leaching of mercury bearing gold tailings. This results in increased exposure to mercury vapours and methylmercury through the food chain.
- Lack of reliable laboratories for mercury testing. This is important in managing exposure to mercury.

Key gender aspects

The gender aspects to be considered in addressing some of the challenges related to the reduction of exposure of ASGM miners and communities to mercury include:

- Ensuring that both women and men are supported to use cleaner gold extraction methods. This may mean better handling of mercury (e.g. stopping the worst practices), and/or introduction of mercury free methods. This applies equally to women and men working in gold buying and smelting.
- There should be affirmative action in removing women from work that has a high risk of exposure to mercury, particularly pregnant and breastfeeding women. This goes hand in hand with ensuring that women have equal access to mercury exposure testing and treatment services.
- Ensuring that women (as primary caregivers) are aware of the dangers of mercury exposure, and supporting behaviour change and taking necessary precautions. For example, for women who are pressured to take and burn amalgam in their homes, provide safer ways of recovering their gold such as use of retorts. Another example, is helping to keep children away from the ASGM sites by providing child care facilities.

Sub-element C1.3.2 A public health strategy including health data on impacts of ASGM and mercury exposure on miners and communities

Challenges to be addressed

Some of the challenges to be addressed by the development of a public health strategy on impacts of ASGM and mercury exposure on miners and communities include:

- Lack of a strategic approach to management of health issues associated with ASGM and mercury.
- Lack of health data, for example on the current and historical health impacts of mercury exposure, and health seeking behaviours of miners and host communities.

Key gender aspects

In the development of a public health strategy, the following key gender aspects need to be considered:

- Ensure that the public health strategy has clear objectives that address the strategic needs of both women and men. This strategy should be grounded in a good data collection plan for a baseline and ongoing monitoring. Women and men must be consulted in the development of the strategy, so that issues like the health seeking behaviour of both men and women miners are well understood to inform appropriate outreach strategies.
- In the M&E framework of this strategy, include indicators and targets that measure gender equality performance,

including disaggregated data where appropriate. This will ensure outcomes such as equal implementation of health monitoring for both women and men.

Sub-element C1.3.3 Training of health care workers to improve health services delivery to miners and host communities

Challenges to be addressed

The training of health workers is a key strategy in addressing the challenges related to improving health service delivery to miners and ASGM communities. The challenges to be addressed in this regard include:

- Limited capacity of health workers and facilities in dealing with mercury health impacts including detecting and treating mercury poisoning;
- Exposure of vulnerable populations in and around mine sites to mercury emissions and releases.

Key gender aspects

The key gender considerations when addressing the challenges related to training of health workers for improvement of health services delivery include:

- Implement capacity building that improve the competencies of health workers to deal with detection of mercury poisoning in both women and men.
- Ensure that women get the same opportunities as men in accessing testing and other health care facilities. This may mean affirmative action to respond to the unique practical needs of women, such as the exposure to mercury of breastfeeding children and foetuses in pregnant women.
- Ensure that there are measures to address the high incidents of injuries to men to safeguard their health (The Asia Foundation found that men in their study have 2.4 times more injuries as women in ASM sites[92]).

Sub-element C1.3.4 Developing programs to raise awareness about health impacts of mercury and limit exposure

Challenges to be addressed

Some of the challenges to be addressed by awareness raising programs on the health impacts of mercury include:

- Lack of communication programs with appropriate messaging for miners and community members; one of the results being limited awareness of the health risks and impacts of exposure.
- Limited awareness of alternative gold processing methods.

Key gender aspects

The key gender aspects to be considered while addressing these challenges include:

- Ensure that programs are developed to raise the awareness of both women and men about the health risks of exposure to mercury.
- Ensure that both women and men miners and their communities are involved in designing and implementing these awareness raising programs. The programs should also include information about how to pursue other livelihood options for both women and men. This may include women only programs to provide inputs, skills etc.
- Relevant authorities and other stakeholders must develop communication programs on all health initiatives with key messages relevant to women and men miners. This may mean targeted messaging for women and men to address their special circumstances, e.g. literacy levels, reproductive responsibilities, their role in bringing children to ASGM sites.

[92] Heemskerk op. cit.

Box 15: Women have specific risks of exposure to mercury because of their reproductive roles

Women's voices:
Women miners from PNG: *"....I know I shouldn't burn the mercury on the stove at home, but the days are long and I am bending and panning all day, I get home tired. I get up early to get my housework done and my children to school, then I travel by truck to river, it is a long way. I spend long hours lifting, shoveling and throwing stones, it's a long day and by the time I get home I am exhausted. If the day is too long I bring home the gold and do it [the amalgamation] at home so I can sell it to pay for food.*

I get up at 6 am to do my housework and get my children ready for school. I then work until 3 or 4 pm collecting concentrate. I then need to amalgamate it. Sometimes I am still on site at 6 pm. I am too tired at the end of the day so I take it home and burn it at home...."[93]

Element C1.4 Socio-economic aspects

Purpose

The purpose of this section is to provide key gender aspects for the following:

a. Activities for the prevention of exposure to mercury of vulnerable populations, particularly children and women;
b. Activities to provide information to ASGM miners and affected communities;
c. Interventions to build the resilience of miners and host communities to economic shocks that might drive risky behaviour;
d. Strategies for accessing finance and alternative livelihood strategies.

The sub-elements below (i.e. Sub-element C1.4.1-C1.4.4) provide specific examples of the challenges being addressed by the strategy and examples of the key gender aspects to be considered in addressing these challenges (refer to Annex 2.8 for more details on the challenges and examples of key gender aspects).

Sub-element C1.4.1 - Activities for the prevention of exposure to mercury of vulnerable populations

Challenges to be addressed

Initiatives to prevent exposure to mercury of vulnerable populations will need to address the following challenges:

- Exposure of vulnerable populations in and around mine sites to mercury emissions and releases. This may be related to encroachment of ASGM activities into community settlements and an increasing risk of exposure for vulnerable peoples.
- Mothers with children and orphaned children seeking livelihoods.

Key gender aspects

Some of the key gender aspects to be considered in addressing the challenges associated with exposure to mercury of vulnerable populations include:

- Ensure that child-bearing women are assigned low risk roles in the mining operations (while also ensuring such risk reduction measures are not used as an excuse to limit women's income by limiting their roles).

[93] Lynas, D. 2018. op. cit.

- Develop community outreach programs that have messaging that is gender inclusive.
- Develop local governance interventions to protect communities (particularly vulnerable people) near rush mining sites from unacceptable behaviours that increase the risk of exposure to mercury.
- Address the issue of child labour that may be linked to how women participate in ASGM and the children's contribution to family livelihoods. Align strategies with international protocols such as the ILO conventions on child labour[94]. Solutions should include strategies for keeping children in school and provision of childcare facilities for women to prevent children being brought to mining sites.

Sub-element C1.4.2 Activities to provide information to ASGM miners and affected communities

Challenges to be addressed

Some of the challenges related to provision of information to ASGM miners and affected communities are:

- Low levels of awareness of miners on the effects of mercury on human health and the environment;
- Mining communities are often in isolated areas and not included in formal social structures to access to social services.

Key gender aspects

In addressing these information provision challenges, the following key gender aspects should be considered:

- Ensure that community outreach programs have messaging that is gender inclusive. For example, the messaging should include information that is relevant and useful to women miners and community members.
- Use messaging platforms that are accessible to both women and men living in remote mining communities. This may include local social and cultural events.

Sub-element C1.4.3 Interventions to build the resilience of miners and host communities to economic shocks that might drive risky behaviour

Challenges to be addressed

Some of the challenges to be addressed by interventions looking to build the resilience of miners and host communities to economic shocks, and thereby reducing the likelihood of risky behaviours with respect to mercury used in ASGM, include:

- Inefficient and non-viable mining operations
- Limited livelihood options for women and children

Key gender aspects

In addressing these challenges some of the key gender aspects to be considered are:

- Support the provision, to both women and men, of technical services to improve mining and processing efficiencies and therefore viability of ASGM operations.
- Support alternative livelihood development for both women and men. This should ensure that the interventions targeting women are appropriate for their circumstances, for example, working from home or near home so they have healthy balance with their reproductive roles and other needs. It may also include improving the access and control over assets for livelihood strategies.
- Support social network development for both women and

[94] The Convention on the Worst Forms of Child Labour (Article 7(2)(c)) obliges countries to ensure access to education (or training according to age) for children removed from the worst forms of child labour.

men. For example, supporting the formation or strengthening women's miners associations, savings clubs etc.

Sub-element C1.4.4 Strategies for accessing finance and alternative livelihoods

Challenges to be addressed

The challenges to be addressed by strategies for access to finance and alternative livelihoods include:

- Low financial literacy and financial exclusion make it difficult for miners to save and diversify from mining by investing in other livelihoods.
- Limited finances make it difficult for miners to transition to mercury free technologies.
- Lack of finance because traditional financial institutions consider ASGM too high-risk for affordable credit.

Key gender aspects

The key gender aspects to be considered when addressing the challenges of accessing finance and alternative livelihoods include:

- Ensure that both women and men benefit equally from access to finance interventions.
- Support women only savings clubs to improve access to capital to invest in mercury free technologies.
- Introduce de-risking measures that target both women and men. For example, credit guarantee funds should be inclusive of both women and men, and can increase the lending appetite of banks. This could go further and use an affirmative action approach for women to improve participation; for example financial literacy training to counter the challenge of low literacy levels in women.

Box 16: Overcoming gendered access to finance

In Indonesia, in the village of Tewand Pajangan in Central Kalimantan Province, a collective of women panners called " Pamuan Jaya Panners" partnered with a Bali-based gold buyer and ethical jewellery company committed to buying responsibly mined gold. A financial support model was agreed upon, with the gold buyer buying mercury free processed gold at 20% higher than market value, as well as providing interest free capital loan at the outset to cover operating costs of equipment needed for mercury free gold processing. The terms of loan repayment were set at 10% deduction from gold payment every month. This model has helped the women miners overcome challenges with gendered barriers to accessing capital[95].

[95] Witni, V., Paul, B., Nijhawan, A., 2020. "Access to Finance for Artisanal and Small-Scale Miners: Imagining Alternatives and Creating Opportunities. Use-Case #1: Downstream Buyer Support for Women Miners in Indonesia". Canadian International Resources and Development, School of Public Policy and Global A airs, University of British Columbia. Vancouver: Canada.

Sub Section C2 Gender considerations for the implementation of gender-responsive action plans for an effective management of POPs

In this Sub-Section, we identify entry points to mainstream gender into the implementation process of gender-smart National Implementation Plans (NIPs). Policymakers and development practitioners working in the field of POPs management can follow the guidance provided here, in their efforts to mainstream gender considerations into their interventions

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Stockholm Convention	Key areas	Strategic interventions
Article 3, Article 5, Article 6, Article 10, Article 12, Article 13	Policy, regulation, and institutional frameworks	• Interventions to create an enabling legal environment to regulate (reduce or eliminate) the production, use, import, and export of POPs (intentional and unintentional). • Interventions to foster stakeholder engagement in the implementation of NIPs interventions (action plans). • Strategies for sustainable and POPs-free development, particularly in the case of SIDS and LDCs.
Article 5, Article 6, Article 9, Article 10, Article 11, Article 12, Article 13 Article 15 Article 15	Technical and environmental aspects	• Interventions to develop and monitor POPs inventories including new sources, stockpiles, and wastes, contaminated sites. • Interventions to identify and promote safer alternatives to POPs. • Interventions to foster innovations and greener technologies. • Interventions to generate knowledge and disseminate best (most effective in achieving a high level of protection of the overall environment including human health) available techniques and best environmental practices (to reduce release or eliminate sources).
Article 9, Article 10, Article 11, Article 12, Article 13	Health aspects	• Interventions to reduce the health burden and the economic footprint resulting from exposure to POPs. • Interventions to develop environmental health research to monitor the health impacts of POPs. • Interventions to strengthen the science-policy interface applicable to POPs management.

		• Interventions to raise awareness and build human and institutional capacities (environment protection and health professionals) to monitor POPs.
Article 10, Article 11, Article 13	Socio-economic aspects	• Intervention to reduce exposure to POPs. • Interventions to enhance resilience to POPs among the most vulnerable social groups. • Activities to raise awareness and build capacities (vulnerable groups). • Interventions to cope with high risks driven by behavior changes. • Strategies to access financing and promote alternatives to risky behaviors.

Element C2.1 Policy, regulatory and institutional frameworks

Entry points should be identified to develop gender-responsive legal frameworks for the management of POPs. In order to do so, interventions working to address legal gaps could be good windows of opportunity and be used as entry points to mainstream gender considerations into the policy, institutional and legal frameworks underpinning an effective implementation of the Stockholm Convention through gender-smart NIPs. To do so, we will go through some of the key legal challenges facing the sound management of POPs. We will also discuss entry points to mainstream gender considerations into various interventions undertaken by countries to set up enabling environments to regulate the use, production, import, and export of POPs, and to foster stakeholder' engagement in NIPs. We will also unpack the main narrative to look at the specific challenges faced by SIDS and LDCs, and the opportunity for these countries to develop sustainable development strategies that are POPs-free but also gender-responsive in line with domestic SDG targets.

Interventions to create an enabling legal environment to regulate the production, use, import, and export of POPs

There are different gaps and loopholes in the existing national policies, legislative and regulatory frameworks regulating the production, use, import, and export of POPs. In the case of e-waste for example, even though different forms of e-waste policies, legislations, or regulations are applicable to 71% of the global population, additional efforts are needed to ensure that legal frameworks are enforced and effectively operationalized towards building adequate collection and recycling infrastructures (Forti, Baldé, Kueh, & Bel, 2020).

An equally important aspect is that legislative and regulatory processes may take significant timeframes to be approved and enforced and thus may hinder the deployment of timely legal responses. POPs regulations and policies may not be agile and dynamic enough to evolve in a way that addresses rapid developments such as following amendments to the Stockholm Convention or significant changes in national circumstances, or emerging threats such as increased exposure to POPs from secondary sources that are transported across boundaries driven by a changing climate.

Giving the increased adoption of new technologies in an increasingly connected

world where products are shipped and flown from pole to pole, it would be safe to assume that legal frameworks tend to be lagging behind the pace with which traditional POPs but also new chemicals exhibiting POPs-like characteristics are being developed by the many industries using such chemicals. For instance, in a globalized market, regulators can face serious challenges in enforcing regulations related to the use of toxic chemicals such as POPs in toys and children's products (Becker, Edwards, & Massey, 2010). POPs are incorporated into a wide range of products spanning multiple economic sectors, which makes it even more difficult for legislators and policymakers to develop multisectoral legislations and ensure effective cross-sectoral coordination and compliance mechanisms.

Another key element to consider is that legal measures are often developed in legal silos without necessarily using blended packages of legal and economic measures such taxes, fees, tradeable permits, extended producer responsibility, "pay as you through" and deposit- refund schemes (SAICM, 2020), which may provide superior results.

While ICTs can play a key role in accelerating legislative and regulatory processes, there are still more men using the internet than women, with women internet users accounting for 12% less than men users worldwide. This gender gap in the use of the internet is even wider-reaching 25% in Africa (ITU, 2017). With more women being offline, men are likely to benefit more from the use of ICT tools as a form of citizen engagement, weakening women's connectivity, and online participation.

Entry Points:

- ✓ Gender-sensitive wording can be used while developing national legislations such as laws, bills, and decrees which provide the legal foundations for the sound disposal and management of POPs. The focus here should be on providing a legal basis for a gender-sensitive management approach throughout the life cycle of POPs.

- ✓ The legal teams in charge of drafting and enforcing POPs legislation and regulations should be gender-balanced, to make ensure that the perspectives of women, men, and other social groups are equally brought to the table and reflected in the legal texts

- ✓ Special quotas should be assigned to the under-represented gender in the decision-making bodies in charge of POPs governance at national and subnational levels

- ✓ Legislators, regulators, and policymakers should benefit from specific training to unpack how the socio-economic burden of POPs is unevenly distributed among women, men, and vulnerable groups and to walk the gender mainstreaming talk by proposing possible entry points for gender considerations.

- ✓ Strengthen the science-policy interface to reassess the existing legislations and address any potential gaps (Teran, Lamon, & Marcomini, 2012). While doing so, scientific data should be sex-disaggregated using gender-sensitive research protocols to enable policymakers to make gender-informed decisions while pursuing legislations at the climate-chemicals nexus

- ✓ To keep up with the pace at which chemicals are developed and incorporated into endless products, the political buy-in for chemicals management in particular POPs should be increased among legislators

and regulators, to expedite slow legal processes through dedicated emergency procedures and the use of ICT for citizen participation and transparency. Women, men, representatives of children, and other social groups most at risk from exposure to POPs should be empowered to use such ICT tools by closing the gender digital divide.

- ✓ Issues of jurisdictional reach related to cross-border movements of POPs should be tackled using gender-sensitive international cooperation mechanisms that promote gender equality along supply chains of products containing or contaminated with POPs.

- ✓ To provide positive market signals and incentivize behavioral change along the value chain, a mixed package of legal measures and economic instruments could be considered to establish the right balance between the benefits of chemicals and their burden on human health and the environment (SAICM, 2020). Women, men, and vulnerable groups should be empowered through capacity building and information sharing to equally benefit from the socio-economic dividends of such economic measures.

- ✓ Under a climate change scenario favoring long-range transport of POPs, there is a need to strengthen the science-policy interface to reassess the existing legislations and address any potential gaps (Teran, Lamon, & Marcomini, 2012). While doing so, scientific data should be sex-disaggregated using gender-sensitive research protocols to enable policymakers to make gender-informed decisions while pursuing legislations at the climate-chemicals nexus.

Interventions to foster stakeholder's engagement in NIPs

One of the main challenges when it comes to reaching out to stakeholders for the implementation of NIPs is the poor understanding of the wide spectrum of products and geographies within which these chemicals are used. For example, farmers' groups may know about the risk of pesticide poisoning, but may not be necessarily aware that their kids may also be exposed through mouthing of toys made from cheap recycled plastics. The same could be said for occupational cleaners, who may be well aware of toxic chemicals in the cleaning products they use but may not have a good risk assessment when it comes to wearing contaminated clothes or using body care products containing POPs. The same also applied to the general public living in settlements close to emissions sources such as landfills, incineration areas, and recycling facilities.

A common misunderstanding with regards to mainstreaming gender into stakeholder engagement processes during the implementation of NIPs is the tendency to think that it's all about bringing women and men in equal numbers. While equal participation of women, men and key subpopulation categories affected by POPs is fundamentally important, it is only by providing the appropriate space and empowerment measures that all stakeholders especially those carrying the heaviest share of the burden can effectively shape the POPs management agenda through NIPs.

Another challenge is often the poor participation of private sector and community level representatives, and even when they do participate, they don't necessarily reflect the diversity of the industries using POPs nor the views of all the social groups involved at the lower end of the value chains such as women and children working as scavengers in informal

e-waste areas to whom access could be difficult.

A key challenge is communicating in an increasingly complex landscape of industries, economic sectors, and stakeholders involved in multi-directional flows of POPs. It is extremely difficult to establish effective and inclusive communication channels to share information and gather the feedbacks and the inputs of the silent majority mostly represented by women, children, and vulnerable social groups who are often overlooked. From children burning cables in e-waste sites to women sewing textiles in garments plants, men working as professional cleaners, women of reproductive age and infants playing with toys, men and women using cosmetics, and so on.

Entry Points

- ✓ Despite budget limitations to enable inclusive stakeholder engagement processes during the implementation of NIPs, special attention should be given to the extent possible to reach out to women and men from all relevant categories of stakeholders and vulnerable social groups to have a good representation of all sectors impacted by POPs.

- ✓ Throughout stakeholder engagement processes, due consideration should be given to creating the enabling space where women, men, children, vulnerable groups, and their representatives feel empowered to bring-in their perspectives and are equally represented in the decision-making processes.

- ✓ Special attention should be given to engaging with women, men, and vulnerable categories representing not only formal but also informal sectors or subsectors of the economy such as e-waste and the small-scale cleaning industry

- ✓ Throughout the drafting process of policies and regulations, extensive consultations should be undertaken including with representatives of groups representing social categories most at risk such as women, children, occupational workers, etc.

- ✓ Establish effective cross-sectoral and gender-sensitive communication channels using local languages, social media, and other tools to reach out to key dissemination platforms such as workers' unions, family health centers, and consumer protection associations. This will ensure that critical gender-sensitive information about POPs is shared with the wider stakeholder base including women, men, children, and vulnerable social groups.

Strategies for sustainable and POPs-free development in SIDS and LDCs

POPs can create tremendous challenges for developed and developing countries alike, particularly in the case of Small Islands Developing States (SIDS) and Least Developed Countries (LDCs) giving their peculiar environments and limited human and technical capacities to ensure the sound management and disposal of chemicals and wastes.

Small Islands Developing States

There are 58 countries identified as SIDS including 38 UN members, in such remote places land can be scarce, and accessing appropriate technology can prove to be difficult or costly. The burden of POPs is a matter of great concern that is becoming more complex considering population growth, rapid development, and the amounts of imported goods. SIDS are also

impacted by globally emitted pollutants released beyond their boundaries, a growing and indiscriminate use of pesticides, and increased amounts of waste (UNEP, 2014). On average, SIDS generate 1.29 kg/capita/day of waste compared to 1.35 kg/capita/day in OECD countries, while mostly using illegal dumping and landfilling (Mohee, et al., 2015). Climate change may exacerbate exposure to POPs by enhancing their long-range transport, thus suggesting that remote areas such as SIDS could be most affected by POPs pollution driven by a changing climate (Teran, Lamon, & Marcomini, 2012).

For example, the financial means needed to implement Samoa's 2019 NIP would amount to USD 25million over the 2020-2025 period, such resources could be accounted for as part of the financial means required to implement national SDG strategies. In line with the Samoa Pathway, SIDS can develop sustainable development strategies that are POPs-free to pursue their SDG targets in line with domestic priorities related to waste management, environmental sustainability, human health, and gender equality. This is where gender mainstreaming becomes part of the solution in light of the emerging gender dynamics, as the traditional gender roles are shifting with more women getting access to education, land ownership, and employment. Nevertheless, compared to men, working women are still getting lower wages and may suffer from domestic violence (UNEP, 2014).

Least Developed Countries (LDCs)

LDCs face numerous challenges including lack of financing, weak technical and institutional capacities, and inadequate legislation in addition to chemicals management being often singled out in separate projects and not embedded as a priority into broader national development strategies. Every year, farmers in Uganda could lose an estimated 24.6 days because of pesticide poisoning resulting in respiratory diseases and skin infections. The monetary costs of inaction in managing new POPs were estimated to increase from USD17.5 million to USD27.1 million over five years, while the cost of action amounted to an estimated USD 10.13 million over the same 5-year duration (NEMA, 2016). Similar to SIDS, Least Developed Countries (LDCs) can overcome the burden and threats posed by harmful chemicals including POPs by setting up appropriate and meaningful enabling environments for their sound management.

When the health burden associated with exposure to POPs shifts towards women or men, it may exacerbate their vulnerabilities to economic hardship and different forms of violence, by depriving them of essential time that could have been otherwise used to earn an income through paid labor, and by undermining women's and men's empowerment particularly in the context of SIDS and LCDs. Once again, mainstreaming gender into POPs management isn't just necessary to reduce exposure among occupational workers or the overall population, its snowball effects should be seen in the development co-benefits that societies with fragile socioeconomic and environmental equilibriums such as SIDS and LDCs, can yield by providing equal opportunities and enabling equitable empowerment of women and men. Doing so is another step forward to achieving the SDGs by 2030.

Entry Points

- ✓ Due consideration should be given to technological solutions that are specifically adapted to the needs of SIDS and LDCs, taking into account challenges related to economies of scale and recycling in the context of the blue economy. Technical teams in charge of developing and deploying

such solutions should be gender-balanced while allowing both women and men to be equally represented at entry-level, mid-level, and managerial positions.

- ✓ Technology transfer should be accompanied by a transfer of capacities by raising awareness and training women and men on the use of technological solutions. Such training should be planned in ways that are compatible with women's caregiving responsibilities to ensure they equally benefit from training similar to their male counterparts.

- ✓ Develop gender-responsive and integrated financing schemes as part of the overall development financing for the SDGs, instead of isolated funding streams for standalone POPs projects, to close the funding gap towards POPs-free development pathways particularly in the case of SIDS and LDCs while recognizing the differentiated needs of women, men and the social groups most affected by POPs.

- ✓ Train key stakeholders involved in NIPs implementation on the use of gender-sensitive budgeting to make sure women, men, and vulnerable social groups equally benefit from development interventions and that these will not result in exacerbating existing gendered inequalities.

Element C2.2 Technical and environmental aspects

Entry points should also be identified to mainstream gender considerations into the more technical interventions within NIPs, related to developing and monitoring inventories of POPs, identifying and promoting safer alternatives, using effective traditional solutions but also exploring innovative approaches and green technological advances. Gender aspects should be also considered while generating knowledge and disseminating best practices to build a stronger knowledge base that fully enables gender-responsive management of POPs.

Interventions to develop and monitor POPs inventories

There are several capacity-related but also emerging challenges when it comes to building inventories and monitoring. For instance, while many countries lack the technical and institutional capacities required to conduct exhaustive POPs inventories of primary emission sources, under a climate change scenario, there might be a need to also include secondary emissions sources to enable effective monitoring of emissions with long-range distribution patterns (Teran, Lamon, & Marcomini, 2012).

Over the last decades, scientific and policy expertise in the area of chemicals' management including POPs, once limited to a few developed nations is increasingly becoming diffuse to developing countries which enabled a new generation of skilled negotiators to advance the architecture of international chemical governance. Nevertheless, the expertise in POPs may not be evenly distributed in a gender-balanced way.

Entry Points

- ✓ Countries should seek gender balance while hiring consultants and while designating their negotiators. The same applies to the experts assigned to regional centers providing scientific, policy, and operational support to countries to strengthen life-cycle management approaches to tacklethe challenge of products and wastes containing POPs including e-waste.

- ✓ Countries should collect sex and gender-disaggregated data as part of their monitoring efforts, including through the use of gender-sensitive international cooperation mechanisms to monitor long-range and cross border distribution patterns of POPs.

- ✓ Countries should plan and conduct gender-sensitive POPs inventories, to better describe, document, and break down the differentiated impacts of POPs by sex and gender.

- ✓ Countries should strengthen and upgrade their POPs monitoring systems to take into consideration the gender aspects by adopting sex and gender-differentiated POPs monitoring mechanisms.

Interventions to identify and promote safer alternatives to POPs

National efforts to identify and adopt safer alternatives to POPs are facing multiples obstacles and challenges that could be hindering or slowing the pace towards the transition to a POPs-free environment. Examples of challenges include the lack of funding, weak technological capabilities, poor R&D infrastructure, non-qualified human resources, and the persistence of harmful subsidies to products containing conventional POPs used in some sectors of the economy.

Entry Points

- ✓ Facilitate access to financing to develop and adopt safer alternatives to POPs taking into consideration the existing inequalities to enable all vulnerable groups such as women, refugees, marginalized communities, and minorities to access productive assets, loans, and financial services.

- ✓ Use a mix of policy and economic tools to provide market signals and positive stimulus to the public and private sectors for the development of R&D capabilities through Public-Private Partnerships and the adoption of safer alternatives to POPs. While doing so, special attention should be given to empower women in these sectors to access quality education and productive assets, to be equally represented in leadership positions, and break the glass ceilings.

- ✓ Assess the costs of exposure to POPs to make a stronger case for the promotion of safer alternatives. Cost estimates should be sex-disaggregated to better understand how women, men, and vulnerable social groups are affected, based on which priority actions should be identified.

- ✓ Build institutional and human capacities to fast-track the adoption curve of safer alternatives to POPs and their deployment at larger scales beyond pilots. Training curricula and ways of teaching should enable women and men who play the roles of caregivers and breadwinners to fully participate and benefit as such.

- ✓ Raise awareness to ensure women, men and vulnerable social groups are aware of the safer alternatives. Context-appropriate approaches should be used such as farmer-fields-schools, volunteer teachers deployed to e-waste sites and textile plants, etc.

Interventions to foster innovations and greener technologies

With the physical and digital worlds converging at an unprecedented pace in the new normal post-Covid-19, several POPs

related issues can be explored using technological advances and novel tech-solutions can be experimented using AI, IoT, blockchain, robotics, big data, and so on. Besides contributing to detoxify the future, by mainstreaming gender considerations into the way such innovations are designed and deployed, they could yield substantive gender dividends while disrupting business-as-usual in the field of chemicals and waste management.

Solving some of the complex issues in the field of chemicals' management depends on advanced technology-based solutions for instance to recycle e-waste, increase agricultural yields, and enable eco-remediation. While seeking alternatives to POPs, that are driven by innovations for instance in the field of green and sustainable chemistry, one of the key challenges is to create enabling environments based on which integrated innovation-ecosystems could be built.

In the agricultural sector, for example, women are not only part of the agricultural workforce; they play vital roles as the custodians of traditional knowledge related to seed conservation and biodiversity management. Yet, a key challenge faced by many countries is the gender gap in agricultural yield. Evidence shows that such a gap could be narrowed down by providing better agroecology training and inputs to women farmers, instead of supporting the use of agrochemicals (Watts & Williamson, 2015).

Informal e-waste workers do often operate in risky working conditions, in the absence of appropriate tools, innovations, and technological solutions that could reduce their exposure to POPs. The investment costs that are needed up-front and the critical needs in terms of technology and capacity transfer are significant obstacles faced by many countries towards a transition to novel and greener technologies in several fields such as waste management, products design and life cycle management, and formulations of cleaning products and cosmetics.

Entry Points

- ✓ Promote research and development to identify and facilitate the use of safer alternatives to POPs. Women and men should be equally empowered to be part of R&D teams working in fields such as green chemistry, agroecology, and biology. To close the gender gap in science scholarships can be provided to the under-represented gender, while women and men hired as scientists or researchers performing the same job, should receive equal wages to close the pay gap, and be encouraged to take managerial and leadership positions despite caregiving and pregnancy-related responsibilities, to break the glass ceiling.

- ✓ Deploying these technologies should take into consideration the existing gender gaps in access to education and qualified jobs. As seen in the e-waste and textile industries, women should not be relegated to low-skilled and less-paying jobs but rather empowered to pursue highly qualified jobs in order to equally benefit from technology transfers and the socio-economic dividends of a circular economy.

- ✓ Financing schemes designed to harness innovations and support the development and adoption of greener technologies, as well as policies and incentives promoting start-ups and innovation ecosystems should support and encourage women-led start-ups and local businesses having a gender-balanced workforce, including through specific quotas for women-led start-ups

- ✓ Combining traditional solutions with technological innovations could increase the uptake of innovation and speed up its adoption to shift the tide of exposure to these silent killers. The gender roles assigned to women and men give them different perspectives, hence the importance of equally capturing their inputs and traditional know-how during the process of introducing novel concepts and technological breakthroughs.

- ✓ Facilitate perception management across sectors and industries using POPs, where these chemicals are perceived as the per default option available. To reduce the dependency on POPs products, more sustainable alternatives should be widely promoted among the general public especially those at the frontlines. For example, DDT can be perceived as the ultimate superior pesticide. By promoting more sustainable forms of agriculture that are less dependent on the use of pesticides, such as through agroecology practices, it will not only reduce exposure to harmful chemicals used in agriculture but it will also strengthen livelihoods and reinforce gender equality. Women should be empowered through targeted training and awareness-raising activities to be equally represented throughout the value chains of agroecology and organic products. By empowering women, they can become change agents and be part of the solution towards a successful transition to agroecology.

- ✓ Raise awareness about POPs-free technologies and innovations among women, men, and vulnerable groups such as occupational workers in the many industries using POPs. Even in cases where men are seen to be more exposed, such as men farmers who directly apply pesticides, awareness-raising activities should not only target men but also women, since the evidence shows that women could be the first to enter fields once pesticides are spread.

- ✓ Promote the use of innovations and technologies to address the gendered burden of air pollution, such as improved cookstoves emitting less or zero emissions, and improved air samplers adapted to unique environmental conditions to assess indoor and outdoor concentrations of POPs and generate sex and gender-sensitive data related to exposure.

Interventions to generate knowledge and disseminate best practices

Undeniably, there is a growing body of knowledge in many areas where we know more about how human health and the environment are exposed to POPs and the likely consequences associated with such exposure. Nevertheless, when we look at the growing list of POPs and other chemicals exhibiting POPs-like behavior, and we consider the virtually endless products to which POPs could be incorporated and geographies they can reach, we can also agree that we still know very little about these silent killers, their true social burden and cumulative costs to our economies and environment.

While there are many studies on POPs and several projects conducted, more efforts are needed to break silos and connect the missing articulation between different teams of scientists, policymakers, and gender experts. Even in areas where there is reasonable expertise on mainstreaming gender in the management of POPs, such as in the fields of pesticides management, this is often limited to a few experts.

Entry Points

- ✓ Create KM platforms to document worldwide experiences and exchange lessons learned from various interventions working on POPs management. By bridging the knowledge gap, we can bring POPs practitioners together with policymakers and other relevant stakeholders such as gender specialists at national and global levels to capitalize on the growing body of knowledge at the cross-roads of gender mainstreaming and chemicals and waste management.

- ✓ Build institutional capacities on gender mainstreaming that are diffuse to multiple stakeholders intervening at different stages of the design and implementation of POPs management strategies and action plans.

- ✓ Ensure that technological solutions are not only used at the high end but also at the lower end of the value chains where POPs are used such as by providing appropriate exploratory tools to e-waste workers that could reduce their exposure to POPs within recycling facilities.

Element C2.3 Health aspects

Interventions to reduce the health burden and the economic footprint resulting from exposure to POPs

The differentiated health impact resulting from the exposure to POPs reflects the gendered roles assigned to women and men at home and within the workspace. It's crucial to understand the health impact of POPs and the cost burden it implies through gender lenses to inform sound and gender-responsive policy making in this area.

A recent estimate of pollution costs in Canada suggests that the annual figures add up to tens of billions of dollars (Smith & McDougal , 2017). Due to data shortages, it is not possible to measure the true cost of exposure to POPs since the data needed to measure the cost associated with each pollutant does not exist. It could be assumed however that once such data becomes available it may only add tens of billions more to translate into economic figures the multifaceted burden of POPs on health, wellbeing, livelihoods, and the environment.

Entry Points

- ✓ To develop sound gender-sensitive interventions, it is crucial to invest in gender-sensitive and sex-disaggregated data to understand the interplay between sex/gender, exposure, and impacts. This should include occupational exposure in both formal and informal sectors, as well as an estimation of the economic burden associated with the impacts of POPs including on maternal health and the health of future generations.

- ✓ Gender task forces should be established to mainstream gender aspects into the research frameworks and protocols.

- ✓ Raise awareness about the scope of exposure among the general public with a specific focus on vulnerable groups such as women of reproductive age, occupational workers, infants, families with low social status, children living in economic hardship, etc.

- ✓ Women and men should be made aware of the true cumulative cost associated with exposure to POPs. For example, the cost is not just about the wages lost during the few days a farmer fall sick because of pesticide poisoning, which tends to be justified by the compensation in yield increase. It is more about the

broader picture including cumulative costs related to sickness, pesticide residues along the food chain, negative externalities on the environment, and the health burden passed on to the future generations.

Interventions to strengthen the science-policy interface applicable to POPs management

To close the gender data gap, there should be a two-way dialogue between scientists and policymakers which is not the case unfortunately for many countries facing enormous challenges and limitations whether these are technical, institutional, financial, or technological.

Entry Points

- ✓ Establish permanent forums where scientists and policymakers can engage each other on the best available gender-sensitive knowledge and policies to curb the health and environmental burden of POPs.

- ✓ Enhanced cooperation between researchers and policymakers can strengthen the science-policy interface, address emerging issues as well as knowledge gaps. If sharing knowledge about research protocol, good practices, health, and environmental impacts information can save costs, enhance acceptance and ownership of novel approaches to assess hazards and alternatives, it can also help the global chemicals and waste community shed useful lights and visualize the silent ways in which gendered norms could drive certain population categories and social groups to be disproportionately affected by POPs and end up paying a higher cost.

Interventions to raise awareness and build human and institutional capacities (health professionals)

Health policies related to POPs should be proactive in raising awareness and building the necessary capacities within health institutions and among health professionals to tackle the many challenges faced by the health sector whether this is about public, occupational, reproductive, or children's health.

Entry Points

- ✓ Raise awareness among the general public about the many ways through which public health could be exposed to POPs and the resulting harmful effects. These effects should be further unpacked using gender lenses to ensure women, men, and vulnerable social groups do fully understand the scope in which they could be exposed and affected.

Element C2.4 Socio-economic aspects

Specific propositions are made here regarding the socio-economic benefits of mainstreaming gender into POPs management, which could be considered as part of the draft guidance on socio-economic assessment for national implementation plan development and implementation under the Stockholm Convention.

SDG 5 on gender equality is not a standalone goal and remains central to achieving all the other SDGs. Policymakers and development practitioners working in the fields of POPs management, need to understand the different ways and forms in which a gender-smart approach to the management of POPs (the same is valid for other harmful chemicals), can yield broader development co-benefits to lift vulnerable populations out of poverty, promote sustainable agriculture, ensure access to

healthy food and clean water, as well as creating decent and safer jobs in the context of circular green economies.

Interventions to reduce exposure to POPs

Entry Points

- ✓ Raise awareness about the multiple sources of exposure and products containing POPs. Awareness-raising activities should be gender-inclusive, adapted to local contexts, and should prioritize population categories, social groups, and occupational workers most at-risk including women of reproductive age, children, youth, and elderly working in the informal sector. The focus shouldn't be only on the usual suspects such as pesticides or e-waste, but also on textiles, cosmetics, cleaning products, children's toys, furniture, and other products containing POPs.

- ✓ In different economic sectors where occupational workers are exposed to POPs, such as agriculture, e-waste, and textiles, women of reproductive age should be assigned low-risk roles along the value chain to mitigate the health burden on the future generation.

- ✓ In sectors where child labor might be practiced, such as agriculture and e-waste, a human rights-based approach (arising from international obligations such as the ILO child labor Conventions or guidelines such as the FAO framework on ending child labor in agriculture) should be combined with economic incentives to promote children's education and investments in childcare facilities.

- ✓ Emissions of atmospheric POPs should be reduced across many sectors, for instance by seeking greener alternatives to energy sources used in households such as for cooking and heating.

Interventions to enhance resilience to POPs among the most vulnerable social groups

It is important to build resilience within various social groups and populations especially those that are most vulnerable to the harmful impacts resulting from their exposure to POPs. While doing so, it is equally important to adopt a gender-sensitive approach to building resilience to POPs.

Entry Points

- ✓ Enable women and men to access better inputs and build their technical skills to improve business performance. For instance, providing better agroecology training and inputs such as drought-resistant seeds to women farmers, instead of supporting the use of agrochemicals, can narrow down the gender gap in agricultural yields. The same reasoning could be applied to informal e-waste, where better extractive tools and protective equipment combined with gender-sensitive training could reduce exposure while boosting the performance of e-waste workers.

- ✓ Ensure that occupational workers can access social security services.

- ✓ Facilitate equal access of women and men to financial services and productive assets to boost their livelihoods.

- ✓ Structure occupational workers in the informal economy into social units or professional structures such as cooperatives that can provide a set of social services and defend their interests.

Activities to raise awareness and build capacities (vulnerable groups)

- ✓ Awareness-raising is key to bring-in in a wide range of stakeholders to become fully informed and aware of the footprint of POPs on global health and the environment, especially on the most vulnerable social groups. A gender-responsive approach to awareness-raising in the context of chemicals and waste will need to be blended with a gender-responsive approach to supporting alternative livelihoods.

- ✓ Instead of one-size-fits-all advocacy and awareness messages, the content should be tailored to address specific concerns tailored to the increasingly specialized sectors at risk of exposure. The information should be gender-sensitive and should reach the usual unreachable and most vulnerable groups in remote or inaccessible areas using mobile technology and cognitive sciences such as behavioral insights to nudge a change of unsustainable behavior.

- ✓ Gender-sensitive and inclusive communication channels should be mainstreamed to decode complex guidelines into simple messages that are context-specific and adapted to the audiences using local languages. For example, in farming communities Farm Forest Schools (FFS) can be used to change the pest management behavior of farmers and empower women to participate in community-level participatory decision-making bodies.

- ✓

Strategies to access financing and promote alternatives to risky behaviors

One of the key challenges facing the management of POPs is the mismatch between needs and resources. While pursuing opportunities such as innovative private financing and economic instruments to close the funding gap, due consideration should be given to gender-sensitive budgeting and allocation of resources when designing and implementing such financial schemes.

Entry Points

- ✓ Provide financial literacy training, to equally empower women and men to benefit from the traditional financing services as well as innovations such as the use of mobile money and digital wallets.

- ✓ Promote gender-responsive micro-financing alternatives to serve social groups, especially women, that are usually unserved by traditional financing systems such as farmers in remote geographies, informal e-waste workers, or textile workers hired on short contracts.

- ✓ Apply gender-sensitive budgeting to make sure women, men, and vulnerable social groups equally benefit from development interventions and that these will not result in exacerbating existing gendered inequalities.

Recommendations and lessons learned

When it comes to POPs, whether these persistent pollutants are used to produce toys or shampoos, whether t-shirts and sunscreens are used locally or exported and used in remote countries, whether exposure happens in an e-waste dismantling facility or a textile factory, whether such toxic compounds are found in fast-food meals or traditional diets, the odds are that there is always a story to tell about how gendered norms, attitudes, and stereotypes can exacerbate the burden within populations that are supposed to be equally affected by POPs.

Despite its image as a "Get rich quick industry", women and men working in ASGM are prone to the harmful impacts associated with exposure to Mercury. Gender-sensitive NAP interventions can pilot non-mercury technologies, and address the impacts of mercury not only as a health issue but also by unpacking the negative socio-economic externalities of ASGM that disproportionately affect the livelihoods and wellbeing of women and social groups most at risk.

Different social groups within the same population could be differently affected by chemicals based on the complex nature of the interplay between exposure and gendered norms, poverty, socio-economic status, access to health services, level of education, access to productive assets, representation in leadership positions and decision-making processes. Health problems resulting from exposure to chemicals, imply additional costs in the absence of social security schemes and limit the time that men and women can dedicate to paid labor thus exacerbating the existing gender inequalities and sustaining the vicious cycle of multidimensional poverty.

Gender equality is a well-recognized global priority that is often addressed from a human rights perspective. While a human rights approach founded on international obligations remains fundamental to advancing the gender equality agenda, greater results could be achieved when complementary approaches are used such as making a business case for gender mainstreaming to rally-on the private sector, or by bridging the gender data gap to uncover the invisible drivers of gender inequality and unlock opportunities to empower women, men, and other social groups to become part of the solution towards achieving the SDGs. Undoubtfully, closing the gender data gap is one of the key challenges as we enter the decade of action for the SDGs signaling the countdown to 2030.

Instead of a generalist approach to collecting gender data, the best approach to mainstream gender into increasingly specialized areas of development practice would be to explore the gender dynamics proper to different development workstreams, including the gender-environment nexus, where priority areas include the right to land, natural resources and biodiversity, access to food, energy, water and sanitation, climate change, sustainable consumption and production, health & well-being as well as women in the environmental decision (UNEP, 2019).

While we have seen huge efforts deployed over the last years and promising results achieved to mainstream gender across MEAs in the areas of climate change adaptation, biodiversity conservation, and chemicals management, with regards to the management of chemicals, it is only by overcoming the gender data challenge that we could truly decode the gender dynamics in the context of chemicals management, understand how such dynamics drive inequalities, to design and implement a new generation of gender-smart NIPs and NAPs.

A new generation of gender-smart NIPs and NAPs will not only support SDG 5 on gender

equality but also SDGs 11 on sustainable cities and communities and 12 on sustainable consumption and production. Even more, different social groups can be discriminately affected by POPs and mercury, thus exacerbating existing inequalities, poverty, and vulnerabilities to climate change and environmental degradation to name just a few. Giving the interlinked nature of the SDGs, countries should strive to mainstream gender into the management of chemicals, to yield a wide range of development co-benefits across the 17 SDGs.

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