

Gender related aspects in chemicals management

Teaching package

On Smart Chemicals Management



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



Regulatory and policy background

After a number of chemical accidents and changes in wildlife animals which could not be explained

In the early 70th of the last century the international Community of state representatives gathered in Stockholm and agreed on the need to respond to the problem of environmental deterioration.

In 1992 in Rio-de-Janeiro at first United Nations Conference on Environment and Development, agreed that the protection of the environment and social and economic development are fundamental to sustainable development.

To achieve such development, **Agenda 21** was adopted as global programme.

Agenda 21 committed policy makers and industry to:

aim at sound management of chemicals throughout their life cycle and of hazardous wastes to protect human health and the environment

Sets the target to achieve, that chemicals are used and produced in ways that lead to the minimization of significant adverse effects on human health and the environment.

Regulatory and policy background

In 2002 the first World Summit on Sustainable Development in Johannesburg

Asked countries to promote the ratification and implementation of relevant international instruments on chemicals and hazardous waste, namely

- Rotterdam Convention on Prior Informed Consent Procedures for Certain Hazardous Chemicals and Pesticides in International Trade
- Stockholm Convention on Persistent Organic Pollutants and the Intergovernmental Forum on Chemical Safety to develop
- A Strategic Approach to International Chemicals Management (SAICM)

Regulatory and policy background- SAICM

Major Aim:

A chemical-safe, clean and healthy future via the sound management of chemicals and waste



Regulatory and policy background



“Gender mainstreaming”: Make both men and women’s concerns & experiences an integral part of policies & programmes



Regulatory and policy background - SDGs

SDG 3.9 - By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination

SDG 5.5 - Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life

SDG 12.4 - By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment

Chemical exposure - health effects

High exposure: acute intoxication, death

Chronic exposures to low levels of toxic chemicals in water, food, air, soil, chemical products:

Causation or exacerbation of many serious human health issues and chronic non-communicable disease

- Cancer
- Respiratory (COPD, Silicosis, Asthma)
- Metabolic-cardiovascular disease (obesity, CVD)
- Reproductive disorders (reduced fertility, congenital anomalies, preterm birth, low birth weight)
- Neurological disorders (ADHD, Autism, behavioural change, reduced IQ)
- Skin sensitization, other allergies

Chemical releases - environmental effects

High exposure: acute intoxication (dead fish, destroyed vegetation);

Chronic exposures to low levels of toxic chemicals in water, food, air, and soil, as well as to chemical products:

- Devastated landscapes
- Reduced biodiversity

Causation or exacerbation of many serious health issues and chronic non-communicable disease

- Cancer
- Reproductive disorders (reduced fertility, congenital anomalies e.g.)
- Neurological disorders

Determining Factors for Exposure to Chemicals

Social:

geographical location/residence,
behavioural patterns (life-style),
Socio-economic status

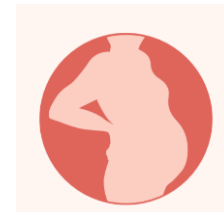


Occupation



The varying roles of men and women in the workplace and at home help determine the respective vulnerabilities to chemical exposure.

age,
nutritional status
other biological factors



Social factors for exposure differences between men and women

Determined by social roles, women, men, and children are exposed differently to toxic chemicals in daily life.

This relates to both kind of chemicals encountered and level and frequency of exposures.

Traditionally

- men may be at higher risk of direct exposure to chemicals,
- women (and children) may be more likely to be indirectly exposed.

Biological factors for differences in effect

Men, women, and children vary in their physiological susceptibility to the effects of exposure to toxic chemicals.

1. Size
2. Physiological differences (higher proportion of body fat)
3. Hormonal differences (e.g. puberty, reproductive cycles, pregnancy, lactation, and menopause)
4. Enzyme (activity) differences

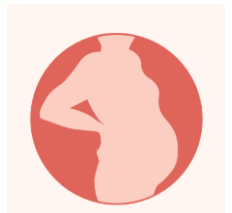
Biological factors – vulnerable phases

Unborn, infants and children higher susceptibility due to:
Relatively higher higher intake than adults (based on body weight)
High sensitivity of developing brain, immune system, endocrine system and reproductive organs

Major vulnerable phases for transplacental impacts to maternal exposure:

Early fetal development

Infancy and the early years of development (breast feeding age)



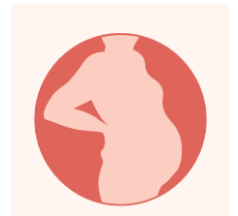
Susceptibility – transgenerational effects

Today there is enough evidence that:

Women's exposure to EDC can cause miscarriages, premature births, birth defects, and low birth weight, and evidence for other transgenerational effects (e.g. cancer, metabolic disorder)

Mens' exposure to specific endocrine disrupting chemicals may reduce fertility

(WHO 2016).



Occupational exposure

Workers are at particular exposure risks in chemically intensive sectors

such as:

Mining

Rubber

Agriculture,

Textiles,

Tanneries

Electronics

Construction

Toys/Plastics

Wood

Etc.



The level and type of chemical exposure at the workplace often differs by gender because women and men generally perform different tasks.

Occupational exposure

The International Labour Organisation (ILO 2005) estimates that hazardous substances kill about 438,000 workers annually, and 10% of all skin cancers are estimated to be attributable to workplace exposure to hazardous substances.

Conventional agriculture chemicals cause about 20,000 deaths per year, most of which occur in developing countries (FAO 2007).



Workers are at particular risk:

Where chemicals are used without regulation or exposure reduction measures

Where do not receive basic training related to the chemicals they use.

Where they do have limited access to sources of uncontaminated food and drinking water.

Domestic exposure – major sources

Drinking water

Food

Construction products

(biocides)

Furniture (VOC)

Household cleaning products

Pest control (e.g., rat poison,
garden insecticides, etc.

Cooking aids (PFC)

Personal care products and
cosmetics (EDCs)

Textiles (flame retardants)

Toys (plastizisers)



There are many sources of domestic exposures to
chemicals and toxins
Such sources are often not known and overlooked

Domestic exposures - Geographical factors

Urban:

factories,
landfill sites,
incinerators,
waste dumps.

Rural:

direct spray drift from
agriculture,
Factory air emissions,
polluted water sources (e.g.,
pesticide and nitrate run-off,
industrial waste waters,
leakage from dumps),
food,
soil,

Chemicals with intrinsic gender specific effects

- Persistent, bio-accumulative, and toxic (PBT) and Persistent Organic Pollutants (POPs)
- Heavy metals : such as cadmium, lead, mercury, etc.
- Endocrine Disrupting Chemicals (EDCs)

PBT/POPs – Characteristics-Production-Use

Persistent bio-accumulative and toxic (PBT) chemicals

Persistent organic pollutants (POPs) are a subgroup of PBT.

POPs include pesticides, industrial chemicals, and chemicals in articles as well as substances formed as by-products.

Given their long half-lives and fat solubility, POPs tend to bioaccumulate up the food chain, especially in the fatty tissue of older animals. Due to their stability and transport properties, widely distributed around the world

POPs appear at higher concentrations in fat-containing foods, including fish, meat, eggs and milk. They accumulate in the human body and relatively high levels are found in human breast milk.

PBT/POPs – MoA, adverse effects

Major risks:

chronic low-level exposure during fetal development, infancy and childhood.

POPs are of concern due to:

potential effects on the endocrine system

(immune system, liver, cognitive ability, the reproductive system)

Ability to cause cancer.

Major risks:

chronic low-level exposure during fetal development, infancy and childhood.



Heavy metals – Characteristics-Sources -Health effects

Heavy metals (HM) comprise lead, cadmium, arsenic and mercury

HM are highly toxic in acute exposure

HM are highly bio-accumulative, and thus accumulate along the food chain and in the body

Health effects may occur after long-term low-level exposure.

Main exposure pathways:

inhalation, atmospheric deposition , agricultural soil and waterway pollution, paints, product waste, food; Mercury also via cosmetics.

Health impacts:

cognitive, neurological and reproductive functions, negative effects (cancer, mental degeneration, cardiovascular disease) in many organs and tissues, including kidneys, brain, bones, and the cardiovascular and respiratory systems.

Endocrine disruptors- Characteristics-Sources -Health effects

Endocrine disruptors (EDC) are a groups of substances that can cause adverse effects by interfering with the body's endocrine hormonal system (thyroid, ovaries, testes and adrenals).

Prominent examples: bisphenol A (BPA), Phthalates, Parabens, brominated flame retardants (BFRs), PFCs

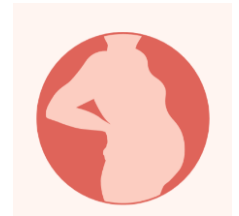
Some EDC are persistent and bioaccumulative, also classified as PBT/POP, Others have short half lifes, but can still cause adverse effects with chronic exposures

Mode of action: disruption of normal cell differentiation, growth and development, metabolism and reproduction throughout life.

Health effects: Increased risk of breast, testicular and prostate cancer, decreases in sperm counts and quality, congenital anomalies in the male reproductive tract, changes in sex ratio (declining proportion of boys), neurological and behavioral disorders in children, impaired immune function

Priority actions for gender equality in chemicals management

- Training/Awareness raising/Information
- Exposure reduction
- Gender Analysis (Knowledge, exposures, health outcomes)
- Gender Indicators
- Communication of Gender Results



Sources



Sources

- UNDCP: Chemicals and gender
- SAICM: Gender and the sound management of chemicals and waste
- PAN: Communities in Peril - Global report on health impacts of pesticide use in agriculture etc.

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