

**SOUND AND SUSTAINABLE MANAGEMENT OF CHEMICALS**

**GESTION RACIONAL Y SOSTENIBLE DE SUSTANCIAS QUÍMICAS**

**GESTION SAINE ET DURABLE DES PRODUITS CHIMIQUES**

**Training to trainers**

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# Sound and Sustainable Management of Chemicals

## Objectives

### Why work on Sound and Sustainable Management of Chemicals

- Organizing and articulating issue at workplace level
- An important occupational health and safety issue. Workers are the first victims of chemicals. Occupational exposure.
- Negative and irreversible impacts on the environment.
- Acknowledge it is an unsustainable chemistry, need to explore and promote a more sound and more sustainable chemistry.



# Sound and Sustainable Management of Chemicals

## Two sides of the same coin

Chemicals have become an indispensable part of our life, sustaining many of our activities, preventing and controlling diseases, and increasing agriculture productivity.

### Human health impacts

### Environmental impacts

- ▶ Production of chemical substances worldwide increased from one million tons in 1930 to 400 million tons nowadays.
- ▶ Approximately 100,000 chemical substances exist.
- ▶ 30,000 are normally used in the workplace.
- ▶ Around 20,000 have not gone through complete and systematic toxicological controls.



# Sound and Sustainable Management of Chemicals

## Human contamination

Up to 300 synthetic chemicals have been found in humans. Human health effects that have been associated with exposure to synthetic chemicals include:

- **for men:** testicular cancer, undescended testicles, low sperm counts, non-Hodgkin's lymphoma, multiple myeloma, work related asthma, workplace cancers.
- **for woman:** breast cancer increase by 50% since 1971, non-Hodgkin's lymphoma, birth defects, spontaneous abortion, work related asthma, workplace cancers.
- **for children:** dramatic rise in childhood cancers, learning disabilities (attention deficit hyperactivity disorder), weakening of the immune system –so, more susceptible to common diseases, premature puberty.



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## Occupational exposure

The ILO further estimates that there are around 270 million occupational accidents and 160 million work-related diseases each year among a global workforce of 2.8 billion people.

- **Hazardous substances kill about 438,000 workers annually..**
- Approximately 125 million workers worldwide are exposed to asbestos in the workplace, which results in at least 90,000 deaths every year.
- Tens of millions of workers are affected of silicosis around the world. In Latin America 37% of miners have some degree of the disease. In India, over 50% of slate pencil workers and 36% of stonecutters.
- However, no data are available so far on the percentage of occupational diseases related to chemicals exposure at global level.

(according to a calculation based on Eurostat data, up to 30 per cent of all occupational diseases recognized annually in Europe can be ascribed to exposure to hazardous chemicals)



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## Environmental Impacts

**Animals** – chemicals can increase in concentration as they move up the food chain for example, from plankton to fish to seals to polar bears, accumulating in the bodies of wildlife species and contributing to serious health impacts.

Animals in the Arctic can be subjected to very high levels of pollution, one reason being the fact that air and water currents carry contaminants from the south.

- Otters and mink - widespread declines of Great Lakes mink, Canadian otter and other species have been recorded in North America and western Europe. PCBs and dioxins are suspected.
- Fish - Chemical pollution can cause hormone disruption. The best-known effect is the feminizing of male fish, which start producing eggs in their testes.
- Crustaceans - brominated flame retardants are highly toxic to crustaceans. They have also been found in sperm whales and, recently, in the eggs of peregrine falcons.



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## Environmental Impacts

**Water:** pollution of lakes, rivers, oceans and groundwater.

**Land:** chemicals can cause changes in the composition of soil (i.e. alkalinity or acidity of soil pH), which affects living organisms and possibly the whole ecosystem.

**Air:** The World Health Organization estimates that 4.6 million people die each year from causes directly attributable to air pollution. Many of these deaths are attributable to indoor air pollution.

### GLOBAL ENVIRONMENTAL IMPACTS

**Acid Rain:** for example, sulphur and nitrogen oxides released from industrial areas have contributed to acid rain.

**Ozone Depletion:** The release of chlorofluorocarbons (CFCs) which were widely used as refrigerants, propellants, plastic from blowers and cleaning agents for electronic circuitry has caused a big reduction in the ozone concentration, known as ozone depletion.

**Climate Change:** and the greenhouse emissions



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## Tragic stories

### Accident: 1984 Bhopal Disaster

On the night of 2 December 1984, over 35 tons of toxic gases leaked from a pesticide plant in Bhopal owned by the US-based multinational Union Carbide Corporation. In the next 2-3 days more than 7,000 people died and many more were injured. Over the last 21 years, at least 15,000 more people have died from illnesses related to gas exposure. Today more than 100,000 people continue to suffer chronic and debilitating illnesses for which treatment is largely ineffective.

### Accident: 2006 Probo Koala

On 19 August 2006, a ship (the Probo Koala) chartered by a Dutch company offloaded 400 tons of gasoline, water and caustic washings used to clean oil drums. The cargo was dumped at Akouedo and at least 10 other sites around the city, including in a channel leading to a lake, roadsides and open grounds. Six people died and close to 9,000 others sought treatment since the toxic wastes were dumped on open-air sites around Abidjan.

### Waste problems: African stockpiles

More than 50,000 tons of obsolete pesticides have been stockpiled in Africa contaminating tens of thousands of tones of soil. While more than 11 million cases of pesticide poisoning occur annually in Africa, few African countries have specialized centres to deal with it.



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## Chemicals of High Concern

Particularly concerned about the following types of chemicals in use today:

- **carcinogens;**
- **toxic, persistent and bio-accumulative substances:** which break down slowly or not at all, and accumulate in wildlife and humans;
- **mutagens:** cause permanent damage to the DNA;
- **neurotoxins:** affect the nervous system (brain and spinal cord);
- **substances that are toxic to reproduction:** affect the reproductive capacity of women and men;
- **sensitizers:** cause allergic reactions;
- **endocrine disruptors:** affect the hormonal system, and it can affect those of the descendants.



# Sound and Sustainable Management of Chemicals

## Trade Union key notions: prevention

### ELIMINATION AND SUBSTITUTION



**PARTICULAR: BLACK LIST** – carcinogenic, mutagen, toxic to reproduction, endocrine disrupters, sensitizers, neurotoxins, TPB (toxic, persistent and bioaccumulative) substances

### PREVENTION



1. **REDUCE AND CONTROL RISK:** adopting measures at the source of the exposure
2. **WORKERS PROTECTION**

### PRECAUTIONARY PRINCIPLE – NO DATA, NO MARKET



**IT TRIES TO ANTICIPATE AND AVOID IMPACTS.** It is a moral and political principle which states that if an action or policy might cause severe or irreversible harm to the public, in the absence of a scientific consensus that harm would not ensue, the **BURDEN OF PROOF** falls on those who would advocate taking the action



# Sound and Sustainable Management of Chemicals

## A definition from Agenda 21

Sound management:

\* encompasses the safe manufacture, storage, transport, use and disposal of hazardous chemicals. In other words, it is necessary to develop a proper form of management for chemicals that takes into account the whole life cycle, from manufacture to disposal  
**-cradle-to-grave management.**



# Sound and Sustainable Management of Chemicals

## An unsustainable global trend

### CURRENT CHEMISTRY

- Negative and irreversible effects on human health and the environment
- Growing and increasing trend
- Highly dependant on fossil fuels

Yet, is the current mainstream chemistry known thus far the only possible way forward? Is there no possibility to move towards more sustainable, clean production models?



# Sound and Sustainable Management of Chemicals

## A green chemistry and sustainable products

### GREEN CHEMISTRY

- Does not accumulate in the environment or in our bodies,
- Does not present toxicity -neither to human beings nor to the environment,
- Is based on renewable resources,
- Minimizes the use of energy and resources,
- Whose products can be reused, recycled or composted at the end of their lives, and
- That produces necessary and useful products and safe jobs.
- *Moving forward to a different chemistry based on imitation of nature, or biomimesis*

The proposal of a sustainable chemistry goes hand-in-hand with the need to develop sustainable products, based on clean production.

Solutions are not always chemical solutions

Materials inspired by nature

It is necessary to consider sustainable consumption

It is necessary to consider the necessity of a certain



# Sound and Sustainable Management of Chemicals

## Structure of the session

- **Safe use of chemicals in the workplace**
  - To look at the procedure for intervention on chemical risk at workplace
  - To look specifically at some information and intervention tools: Globally Harmonized System and Safety Data Sheets
- **Chemical management: understanding current chemistry and advancing towards a more sound and sustainable chemistry (green chemistry)**
  - To understand better toxicology and the effect of chemicals on human health and environment
  - To develop on the concept of green chemistry and precautionary principle
  - To provide some information sources and resources
- **Chemicals Regulation and Trade Union participation**
  - To define possible entry points for Trade Unions participation in environmental processes on chemicals
  - To introduce the Strategic Approach to International Chemicals Management (SACIM)
  - To look into Collective Bargaining Agreements



# Sound and Sustainable Management of Chemicals

**THANK YOU!**

**All comments on the guide are more than welcome**

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