



Sound and Sustainable Management of Chemicals

A Training Manual for Workers and Trade Unions

Sustainlabour

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Chemical weapons dump, Canada. Hazardous chemicals can persist in the environment for decades, accumulating in the food chain, and can be transported far from the original source. They form major health risks for workers, damage the nervous and immune systems, cause cancers and reproductive disorders, and interfere with child development. To save lives and protect the environment by eliminating the most toxic chemicals will cost billions of dollars.

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SOUND AND SUSTAINABLE MANAGEMENT OF CHEMICALS

A training manual for workers and trade unions



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**“Strengthening trade union participation to international
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BACKGROUND

The Training Manual on Sound and Sustainable Management of Chemicals is developed under the framework of the project “Strengthening trade union participation in international environmental processes”, jointly implemented by the United Nations Environment Programme (UNEP), the International Labour Foundation for Sustainable Development (Sustainlabour), in collaboration with the International Trade Union Confederation (ITUC), and its affiliates, the International Labour Organization (ILO), the World Health Organization (WHO) and the Government of Spain.

The overall objective of the project is to improve engagement of workers and trade unions in the development and implementation of environmental policy, as recommended by the Trade Union Assembly on Labour and the Environment at its first meeting in January 2006. The main purpose of the training component of the project is to address a clear gap and lack of knowledge of the environmental issues at stake regionally and globally in the trade union movement. The training component of the project focuses on two topics:

- a. **Climate Change**, its consequences on employment and trade union action, and the need for alternative methods of production and just transition;
- b. **Sound and Sustainable Management of Chemicals** and how to integrate just employment into environmental policy design.

Manual objective

The purpose of this Manual is to enhance understanding of sound and sustainable management of chemicals and of related risks in the workplace. Particular attention is given to the “environmental” rights of workers exposed to chemicals and hazardous substances.

Trade unions are uniquely placed to sensitize workers about the impact of industrial chemicals on occupational and environmental health, to promote and demand that both public and private sectors develop programmes on chemical safety, as well as to train workers to contribute and verify that these measures are adequately implemented.

In this regard, access to information and training are necessary to improve working conditions. The purpose of this Manual is to provide workers and trade unions with general information and guidance on how to ensure sound and sustainable management of chemicals.

Manual format and content

The Manual is designed in modular format and may be used integrally or partially in modules, depending on the purpose and duration of the training. Modules can be studied not necessarily in a chronological order. The expected length of the training period is five days, however the Manual is designed in such a way that trainers may add or leave out sections for a specific training session to shorten or lengthen the suggested training.

The content is designed to be applicable at different spatial levels – from the national, sub-regional, regional, and global level. It contains several case studies from the workplace to illustrate the theoretical aspects of the Manual.

The Manual targets mainly workers and trade unions, both from developing countries and countries with economies in transition from Africa, Asia and the Pacific, Eastern Europe, and the Caribbean. The Manual targets experienced or inexperienced workers and trade unions in chemicals management issues. It attempts to combine different types and levels of information to suit the needs and interests of all; though, it targets mainly an inexperienced audience.

The Manual is elaborated for women and men, workers, who are in industry, agriculture, government and other public or private sectors, to enable them carefully consider the potential adverse effects of hazardous chemicals on health and the environment, and ultimately on employment, and take appropriate actions at the local, national or international levels for their environmentally sound management.

The first module focuses on the concept of sound and sustainable management of chemicals. It is a general introduction to key concepts of chemistry such as toxicity, human and environmental effects, occupational exposure, dose-effect relationship; concepts normally used and associated to the workplace. The concepts of substitution and green chemistry are also presented as options to move towards sound and sustainable management of chemicals.

The second module lays out practical advice, as it provides guidelines and concrete examples to facilitate a structured intervention in the workplace. That is to say, what should be done and how it could be done.

The last module explores the regulation mechanisms of chemicals from international to workplace level. The module briefly introduces the main mechanisms in place, and particularly underlines the importance of stakeholders' participation, namely workers and trade unions.

Course evaluation

At the end of the training, an evaluation is requested from the trainees. The evaluation allows trainees to highlight points that will assist trainers to improve their delivery of the course, and to facilitate the review and revision of the Manual over time.

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INTRODUCTION

Sound and sustainable management of chemicals: the basics

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

Synthetic chemicals used in farms help feed us. Chemicals provide synthetic fibers for clothing and molecules to manufacture medicines. They provide the basic materials to the manufacturing of cars, phones and computers, as well as many building materials, rugs and other furnishings.

The benefits are immense. However, one cannot ignore that chemicals may also damage human health and poison the environment.

The nature, variety and quantity of chemicals used in countries vary widely according to factors such as the country's economy, and the structure of its industrial and agricultural sectors. More than 43 millions of chemical substances are used on a global scale.¹ Production of chemical substances worldwide is set to rise from one million tonnes in 1930 to 400 million tonnes nowadays.² Chemicals have contributed to the improvement of living conditions, and there is no denying that they yield benefits without which modern society could not do (e.g. in the production of food and pharmaceuticals).

The global chemical industry also contributes to economic prosperity in terms of trade and jobs. Its annual sales are estimated at more than US\$1,600 billion. The industry employs over 10 million people worldwide.³

However, chemicals can also cause irreversible damage to human health and the environment since many have potentially toxic effects. Exposure risk arises during production, storage, handling, transport, use and disposal of chemicals, as well as from accidental leakage or illegal dumping. Thus, the whole life cycle of a chemical substance needs to be considered when assessing its dangers and benefits.

In particular, both the manufacture and use of chemicals takes a heavy toll on workers. Millions of them are exposed to chemicals (occupational exposure) on a daily basis, not only in the chemical industry but in sectors where they are used, including agriculture, the building and construction sector, the woodworking industry, automobile, textile and electronics manufacturing.⁴

1 CAS Database Registry: <http://www.cas.org/expertise/cascontent/registry/regs.html> (last accessed 14 April 2008)

2 Copenhagen Chemicals Charter, Chemicals Under The Spotlight, International conference, 27-28 October 2000, Copenhagen http://www.eeb.org/publication/2000/CCC_from_BEUC_corrected_EL_clean.pdf (last accessed 14 April 2008)

3 International Council of Chemical Associations (ICCA) www.icca-chem.org (last accessed 19 December 2007)

4 Including the disassembly of mobile telephones, computers and other electronic equipment, which are often sent from industrialized to developing countries for this purpose. Shipbreaking is another example of the transfer of disassembly to developing countries (e.g. India), with potentially lethal consequences for the health of those engaged in this type of work. www.ilo.org/public/english/protection/safework/wdcongrs/intrep.pdf (last accessed 19 December 2007)

Chemical hazards are currently a major cause of occupational mortality in the world.

According to the International Labour Organization (ILO), 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.⁵ Additionally, the World Health Organization indicates that approximately 125 million workers worldwide are exposed to asbestos in the workplace, which results in at least 90,000 deaths every year; the figure is rising annually.⁶

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.⁷ However, no data are available so far on the percentage of occupational diseases related to chemicals exposure at global level.

The worker handling chemicals is not the only one at risk. Individuals may also be exposed to chemical risks at home. The environment as well is affected, as chemicals may pollute the air we breathe, the water we drink, and the food we eat. They may have reached forests and lakes, destroying wildlife and altering the ecosystems.

As a result of economic activity, many chemicals are released into the environment. They are not only generated by the chemical industry (quantitatively, power generation, and metals and mining industries are larger sources of pollution), but also by other sectors, for example agriculture, car manufacturing, construction, energy production, extraction of fossil resources and minerals, metallurgy, pharmaceuticals, textile or transport, among others.

The environment has been at the receiving end of a wide range of hazardous substances, which has caused unprecedented environmental degradation. The challenge has now to be addressed as it is a struggle for the future of the planet, an issue of survival for other species and quality of life for humans.

One of the root causes of environmental degradation by chemical substances is the lack of knowledge about the inherent hazardous properties of most chemicals found on the market and their sound and safe use. It is an appalling fact that over 99 per cent of the total volume of marketed substances has never undergone in-depth assessment of their risks to human health and the environment.⁸ The direct consequence of this lack of data is that many hazardous chemicals are not classified as such, and are therefore sold without appropriate labels or safety data sheets. Thus, many chemicals are used in the workplace while their potential effects on the health of workers exposed to them and on the environment are barely known, or known too late.

5 International Labour Organization. ILO (2005). "Facts on Safety at Work" http://www.ilo.org/wcmsp5/groups/public/--dgreports/--dcomm/documents/publication/wcms_067574.pdf, (last accessed 14 April 2008)

6 "Asbestos Exposure Responsible for 90,000 Deaths Annually". Asbestos News <http://www.asbestosnews.com/news/asbestos-deaths-annually.html>, (last accessed 14 April 2008)

7 International Labour Organization. ILO. 2005. "Facts on Safety at Work" http://www.ilo.org/wcmsp5/groups/public/--dgreports/--dcomm/documents/publication/wcms_067574.pdf

8 European Commission (February 2001). "Strategy for a future Chemicals Policy". White Paper. COM(2001) final.

Chemical risks at work derive both from the intrinsic hazardous properties of chemicals and from workers' levels of exposure to these substances, reflecting the way in which they are used in the workplace. When it comes to safe use of chemicals at work, the situation varies according to countries, sectors of activity and company size.

In industrialized countries, while important improvements still have to be made in large companies, the main areas for improvement lie in small and medium-sized enterprises (SMEs), where existing legislation or good practices aimed at protecting workers' health and the environment from chemical risks are scarcely enforced.

In general, the situation in developing countries is particularly alarming. Often chemicals are used at industrial and agricultural sites with highly toxic active ingredients, which, although they may have been banned in industrialized countries, are still marketed in the developing world. Protective equipment is often not available, and information and training are mostly lacking. Due to less stringent regulations and, as a consequence, deliberate corporate strategies to relocate production to countries with lower standards, workers in these countries are increasingly becoming victims of social, environmental, and health and safety dumping.

The growth of chemical industries, both in developing and developed countries, is set to go on increasing this XXIst century. Reorganization of the conventional chemical industry (the most polluting of all industries) to green or sustainable chemistry seems a necessity not only in order to decrease the toxic pressure on humans and other living beings (adverse effects on health and reproduction), but also to maintain the benefits the chemical industry provides to society through a variety of services and the millions of jobs it sustains.

The environmentally sound management of toxic chemicals requires proper management of chemicals from manufacture to disposal (often referred to as cradle-to-grave or life-cycle management). This means developing a chemistry as little harmful as possible, based on the application of a series of principles that help reduce or eliminate the generation of hazardous substances in the design, manufacturing and use of chemicals:⁹ for example, using renewable raw materials, manufacturing non-toxic and biodegradable products, and avoiding waste.

Clean production and green/sustainable chemistry need to be factored in the discussion as they pave the way to sustainability. These are new concepts that have to gain importance in research, negotiation, and the production process if sustainable development is to be attained.

Basic elements for sound and sustainable management of chemicals are:¹⁰

- (a) adequate legislation;
- (b) information gathering and dissemination;
- (c) capacity for risk assessment and interpretation;

9 Anastas, P. T.; Warner, J. C. *Green Chemistry (1998): Theory and Practice*, Oxford University Press: New York, p.30.

10 Based on Agenda 21: Chapter 19 - Environmentally Sound Management of Toxic Chemicals, Including Prevention of Illegal International Traffic in Toxic and dangerous products

- (d) design of a risk management policy;
- (e) capacity for implementation and enforcement;
- (f) capacity for rehabilitation of contaminated sites and healing of poisoned persons;
- (g) effective education programmes; and
- (h) capacity to respond to emergencies.

Occupational health and environment are two sides of the same coin, since the measures we adopt to protect workers health will protect the environment and vice versa. The basic principle of prevention consists in substitution or reduction to the minimum of the hazardous chemical agents in the workplace. Prevention and management of hazards, and consequently chemical safety, are essential to contain and reduce related health and environmental risks.

This publication aims at explaining and assessing the risks of the current model for the chemical industry, and the need to move towards a new, environmentally-sound chemistry. With this view, urgent measures have to be taken, particularly in the workplace, to minimize the significant adverse effects that some chemicals have on human health and the environment.

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