

Protecting human health and the environment: A guide to the Rotterdam Convention on hazardous chemicals and pesticides



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The initial list of chemicals subject to the Prior Informed Consent (PIC) procedure *

PESTICIDES

2,4,5-T
aldrin
captafol
chlordan
chlordanimeform
chlorobenzilate
DDT
dieldrin
dinoseb and dinoseb salts
1,2-dibromoethane (EDB)
fluoroacetamide
HCH (mixed isomers)
heptachlor
hexachlorobenzene
lindane
mercury compounds, including inorganic mercury compounds, alkyl mercury compounds and alkoxyalkyl and aryl mercury compounds
pentachlorophenol

SEVERELY HAZARDOUS PESTICIDE FORMULATIONS

monocrotophos (soluble liquid formulations of the substance that exceed 600 grams active ingredient/litre)
methamidophos (soluble liquid formulations of the substance that exceed 600 g active ingredient/l)
phosphamidon (soluble liquid formulations of the substance that exceed 1000 g active ingredient/l)
methyl-parathion (emulsifiable concentrates (EC) with 19.5%, 40%, 50%, 60% active ingredient and dusts containing 1.5%, 2% and 3% active ingredient)
parathion (all formulations – aerosols, dustable powder (DP), emulsifiable concentrate (EC), granules (GR) and wettable powders (WP) – of this substance are included, except capsule suspensions (CS))

INDUSTRIAL CHEMICALS

crocidolite
polybrominated biphenyls (PBB)
polychlorinated biphenyls (PCB)
polychlorinated terphenyls (PCT)
tris (2,3-dibromopropyl) phosphate

* For the most up-to-date list of the chemicals subject to the PIC procedure, please consult the Rotterdam Convention website www.pic.int.

Introduction:
70,000 chemicals on the world market. . .
1,500 new ones every year. . .
How do you know what's safe?



In the Japanese seaside city of Minamata, in the mid-1950s, residents began to notice cats exhibiting bizarre behaviour – moving in a jerky fashion, stumbling, sometimes falling into the nearby bay and drowning. In 1956 (although in retrospect it was clear that some cases had surfaced earlier) similar difficulties began to appear in people: loss of motor control, dizziness, slurred speech, confused thinking, convulsions, and even death. By the end of that year nearly 100 victims of this syndrome had been identified and over 20 had died.

Investigations showed that the cause was the heavy metal mercury, which permeated the sediments of the bay from which many residents (and cats) consumed seafood. The mercury came from a local factory that manufactured acetaldehyde, used to produce plastics. It had entered the bay for decades in the plant's wastewater and, in the organic form of methyl mercury, it had entered the food chain.

The problem didn't end with the discovery of the cause. Even after fishing in the bay was prohibited, new cases cropped up for years as previous exposures exacted their toll on the nervous systems of people who lived in the area. The heavy metal was also passed on from mothers to children – infants were "born" with the disease. New cases continued to appear into the 1980s.

There was also the question of who was a "victim" and who was not. It is hard to quantify such things as loss of intelligence or to determine if shaky hands or difficulty with walking can be attributed to a particular cause. In the end, the Japanese Government verified around 1,800 victims of mercury poisoning in the region of Minamata, of whom over 400 had died. Unofficial estimates put the toll as high as 10,000 victims and 3,000 deaths. Mercury still fouls the sediment of the bay. It is an element; it does not degrade.

This catastrophe happened decades ago, when industrialization was vigorously pursued and chemicals were known much more for their contributions to economic advancement and rising living standards than for their potential – and often delayed – negative effects.

It is now better understood that some chemicals, once they are released into the world, cause toxic reactions, persist in the environment for years and even decades, and may travel thousands of kilometres from where they were used. While more alert to such dangers, citizens and Governments also remain in favour of jobs and thriving economies (Minimata's acetaldehyde plant, it should be pointed out, was the major local employer), and deciding which chemicals are acceptable and which pose too many risks is a complicated matter . . . made a lot more complicated in an ever-modernizing world where there are now 70,000 chemicals on the market and 1,500 new ones are introduced each year.

There is also a thriving international trade in pesticides and other chemicals, with products that are banned in some countries being widely sold and used in others. The world's less developed countries are desperately striving both to industrialize and to raise farming yields, and sometimes they use chemicals they don't have the technology to handle safely.

How do you deal with such a situation? How do you balance the benefits and risks?

To respond to this challenge, the world's Governments adopted an international treaty in 1998 called the **Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade**.

The objective of this agreement is to promote shared responsibility and cooperative efforts between exporting and importing countries for managing chemicals that pose significant risks in order to protect human health and the environment. It also seeks to encourage the environmentally sound management of these chemicals when their use is permitted and to provide and share accurate information on their characteristics, potential dangers, and safe handling and use.

The key to the Convention is **Prior Informed Consent (PIC)**, a procedure aimed especially at helping developing countries, many of which can find it difficult to monitor and control imports.

If a member country – generally referred to as a State party – decides not to import a particular chemical or pesticide covered by the PIC procedure, other State parties agree not to export this product to that country. If a country decides to limit the import of a chemical to certain uses, exporting countries agree to respect those limits. Prior Informed Consent promises not only to reduce accidents but also to prevent the accumulation of stocks of obsolete or unwanted pesticides.

Five industrial chemicals and 22 pesticides were included on the initial list of chemicals covered by the PIC procedure when the Rotterdam Convention was adopted; others have already been added, and the current PIC list can be expected to expand on a regular basis in the years to come.

Mercury compounds that are used as pesticides are on the list. So are the pesticides aldrin, dieldrin, lindane, monocrotophos and DDT, the latter famous for decimating bald eagles, ospreys, and other predatory birds and for contaminating the milk of nursing mothers. Also on the list is the industrial class of chemicals known as PCBs, which have received a great deal of publicity for polluting rivers and lakes, killing or poisoning fish, and causing several human health scandals, including contamination of rice oil in Japan in 1968 and Taiwan in 1979.

Other chemicals that are on the list and covered by the PIC procedure include various forms of asbestos. Once widely used, asbestos is now known to be a major cause of mesothelioma and lung cancer. In recent decades, billions of dollars have been spent removing asbestos from buildings and caring for and compensating workers and others who have been exposed to the tiny fibres of asbestos and became sick or died.

The treaty can be viewed as a response to four major questions involving the trade and use of potentially hazardous chemicals and pesticides.

Question No. 1: When or how is a chemical too dangerous, and how do you know?



No one knew much in the 1950s about the risks of contamination from industrial mercury. That lesson was learnt the hard way. And it's noteworthy that the story played itself out in an already industrialized country – symptoms were noticed, the cause was tracked down, remedial steps were taken and compensation offered. The poorer countries of the world have also seen many cases of chemical contamination, including some that have gone unnoticed or undiagnosed, or have received little medical investigation or response, and certainly have not resulted in compensation.

Should mercury, whose use as a pesticide is now banned in many countries, be exported to nations where health and environmental controls are less advanced? That is certainly a choice that should be made carefully and soberly by importing countries.

Requiring proof of an irrefutable link between a certain chemical and a particular health or environmental damage may be too high a standard in situations of potential risk. Chemical contamination can be so complicated that pinpointing a culprit is nearly impossible. There is still a lively debate, for example, over whether the pesticide DDT is as harmful as it is generally claimed to be.

It is hard, in the end, to "prove" things. The bald eagle, the national bird of the United States, nearly became extinct a few decades ago, and it is widely thought that DDT, which was used in massive amounts in the mid-20th century, was responsible. The chemical appears to have passed from female birds to the shells of their eggs, thinning them so that they broke before healthy chicks could hatch. (The same effect was noticed in several other species of predatory birds.) But some critics said the evidence for this was not conclusive, and noted that other factors – such as loss of prey and habitat – could have been responsible for sharply declining eagle populations. DDT nonetheless was banned in the United States, and the bald eagle – aided by energetic breeding programmes – has made a pronounced comeback.

In general, erring on the side of caution appears to be a good approach where chemicals are concerned. People and their Governments should know what are the potential risks – the doubts – and then should be able to decide whether they are worth the benefits. This idea is known as the precautionary approach and is highlighted in the Rio Principles adopted by Governments at the 1992 Rio Earth Summit.

Balancing such risks and benefits can be a complicated matter. DDT, for example, is a cheap and very effective agent for killing or repelling the mosquitoes that spread malaria, a disease that annually kills 1 million children under the age of five, most of them in sub-Saharan Africa. The benefits of a judicious application of this chemical to the walls of dwellings – especially in rooms where people sleep – are so valuable in regions where malaria is prevalent that some tropical nations have decided that continuing to use DDT for this purpose (and this purpose only) is justified.

In the end, choices about chemicals can vary from country to country and can depend upon economics, technological capacities and local conditions.

How the Convention helps:

- The Rotterdam Convention enables member countries to **alert each other to potential dangers**. Whenever a member Government anywhere in the world takes an action to ban or severely restrict any chemical for health or environmental reasons, this action is reported through the "PIC circular" that the Convention secretariat distributes to all member countries every six months. By ensuring that information is exchanged in this way, the Convention provides an initial warning to Governments that a particular chemical may merit a second look.
- Whenever a country bans or severely restricts a chemical or pesticide domestically but makes it available for export to another country, it must **provide the importer with an export notification** containing practical and detailed information about the chemical and the shipment.
- The Convention includes a **list of chemicals and pesticides** that are subject to the legally binding Prior Informed Consent procedure. This is not a "black list", but rather a "watch list" of industrial chemicals, pesticides and "severely hazardous pesticide formulations" (which contain a specific percentage of one or more particular active ingredients) whose use should be carefully weighed and whose import needs to be agreed. (See the initial list on page 2.)



Question No. 2:

How can countries quickly identify new and emerging threats from potentially dangerous chemicals and pesticides?

With tens of thousands of chemicals and pesticides on the world market, many of them produced in numerous forms, Governments have their hands full, especially as global trade expands every year. New formulations arrive all the time, and imports – chemicals ordered from abroad by local users – tend to be regarded with optimism rather than scepticism: these products are expected to protect crops from insects or otherwise to increase industrial, business or farming profits. No-one likes to think that instead they may damage the environment or make people ill.

Health and environmental officials, to the extent that they are able, keep track of information on this flood of chemicals – they listen to reports from other countries and pay attention to the reputations various products have for effectiveness and safety.

They also keep their ears to the ground for domestic news – because danger can often have a lot to do with local methods, customs and technologies.

Several years ago, for example, Government officials in Senegal began to hear about, and subsequently to "map", mysterious cases of poisoning in rural areas: fevers, chest and abdominal pains, vomiting, insomnia and even death. These investigations pointed the finger at a specific pesticide formulation applied on seeds as a powder by peanut farmers. While such powdered formulations may be safely used in developed countries, where seeds are often treated and planted mechanically, they are riskier in a country like Senegal, where agriculture tends to be manual. In rural areas, the treated seeds were handled directly, protective clothing was not usually worn (because not available), and some farmers even bit the peanuts to release the seeds. Contacting the Convention's secretariat, the Senegalese Government reported the dangers posed by the pesticide when it was used in this fashion.

How the Convention helps:

- As described above, the Convention **guarantees the cooperation of other Governments** on known and existing risks through its provisions regarding information sharing, export notifications and the PIC procedure.
- The Convention is designed to respond to future risks as well. If two countries from two different regions of the world decide to ban or severely restrict a particular chemical, then the chemical becomes a candidate for being placed on the list of substances covered by the Convention's PIC procedure and is **referred to the Convention's Chemical Review Committee for investigation**. This panel of experts is responsible for scrutinizing the potential dangers of the chemicals brought to its attention. Countries that lack expertise thus have a watchdog group on their side. The Committee may recommend adding a chemical to the list covered by the PIC procedure, and the Conference of Parties (the periodic meeting of member States) may then add the chemical to the list. The Committee's recommendations and discussions provide countries with useful information on the possible threats posed by new chemicals or pesticides, or on previously unsuspected threats posed by chemicals that have been in circulation for some time.
- If a single developing country or country in transition to a market economy is **experiencing problems caused by a severely hazardous pesticide formulation** under conditions of use in its territory, it may propose the addition of that formulation to the list covered by the Convention. The formulation will then be investigated by the Chemical Review Committee.



Question No. 3:

How can less wealthy countries responsibly manage chemicals and pesticides?



They need help, clearly. This is not only a practical matter – environmental damage, serious illnesses, sick and absent farmworkers and obsolete stockpile clean up operations can be very expensive – but also a matter of fairness.

As with so many aspects of the relationship between rich and poor countries, there have been inequalities relating to the use, marketing and trade of chemicals. Most of the chemicals now considered unacceptably hazardous were developed in industrialized countries (although the production of many of these chemicals has been steadily shifting to the developing world). When their liabilities became apparent, rich countries banned or restricted these chemicals but sometimes continued to export them to developing nations, where safety and environmental standards tended to be less stringent.

One disadvantage for less economically advanced countries is that the alternatives to hazardous chemicals and pesticides may be more expensive and more complicated to use. Nations with high standards of living can afford greater costs, but in the developing world higher price tags may mean alternatives are not really alternatives.

The stakes can be higher too. Pesticides are important. In a wealthy nation, where enough food is available, destruction of a harvest by crop pests may be a business calamity, but not a matter of life and death. But for a poor rural farmer in a developing country, the loss of a harvest may threaten the existence of his or her family or spur people to migrate from agricultural land to the slums of the developing world's cities.

There also are risks inherent in the occupational balances of poor and rich nations. Agriculture in industrialized States is carried out by a relatively small number of people and is heavily mechanized. In poor countries, farming is the way the majority of the population survives, and it is a hands-on activity. Statistics kept by the International Labour Organization show that agricultural workers run at least twice the risk of dying on the job as do workers in other economic sectors – some 170,000 die each year as a result of work hazards, and millions more suffer serious injuries or poisoning from pesticides or agro-chemicals. Most of this damage occurs in developing countries. Attention to pesticide and chemical dangers is clearly a matter of heightened importance for such countries.

How the Convention helps:

- It calls for the **provision of technical assistance to developing countries and countries with economies in transition** to help them establish the infrastructure and the capacity necessary to safely manage chemicals and pesticides. More advanced countries are expected to provide equipment, advice and training.
- The Convention calls on member countries to **exchange scientific, technical, economic and legal information** concerning chemicals within the scope of the treaty, thus enabling nations with less extensive knowledge to benefit from more advanced techniques for monitoring and analysis.
- It makes the **sale of dangerous chemicals abroad more transparent and less vulnerable to abuse** by encouraging harmonized labeling of exported chemicals, as well as the provision of safety data and information on health and environmental risks.
- It obliges member countries to ensure that their **citizens have access to information on hazardous chemicals and pesticides**. Since there are many chemicals and pesticides, and new ones are developed every day, farmers in developing nations need to know if what they are using is dangerous. They also can benefit greatly from being told that affordable alternatives may be available.

Question No. 4:
How can countries protect human health and the environment as the development and marketing of chemicals accelerates over the coming years and decades?



This is a big challenge. There are presently on the order of 70,000 chemicals available on world markets with some 1,500 new ones added each year. Such totals and rates can only be expected to rise.

One thing that will help is if the majority of the world's countries ratifies the Rotterdam Convention. The more nations that play by the Convention's rules, and therefore watch out for themselves and each other; the more eyes that are keeping a lookout for potential dangers, and then sounding the alarm for everyone when they appear; the more exports and imports that are carried out transparently and with sufficient health and safety information; the more help provided to developing nations – the better off everyone will be.

The Convention is perhaps best thought of as a dance that needs to be learned, a communal dance of the sort performed in villages the world over. The analogy is a good one: the phrase "global village" is frequently used these days, and as far as the international trade in chemicals and pesticides is concerned, the world is a village. The various participants need to master the steps assigned to them under the Convention: Governments, scientists, health officials, safety authorities, farmers, factory workers, import and export firms . . . As they get the hang of it and learn to work together and depend on each other – and as more join over time – the accumulating knowledge and the expanding protection will benefit everyone.

How the Convention helps:

- The benefits of the Convention – information exchange, aid to developing countries, health and safety data, and especially protection from potentially dangerous imports through the Prior Informed Consent procedure – **encourage increased membership**. In addition, certain **regional organizations may join** the Convention, thus expanding the potential resources and expertise available. The European Community, for example, has already joined.
- The treaty is **flexible**. It can be amended to meet future circumstances. In particular, Governments can add new chemicals and pesticides to the list covered by the PIC procedure – and they are likely to add dozens of new substances over the next few years. There is even a provision for removing chemicals and pesticides from the list. Final authority over the functioning of the treaty rests with the Conference of the Parties, which will meet on a regular basis.
- The Convention requires that **the general public have appropriate access to information** on hazardous chemicals and pesticides. The emphasis on **public education** means that general knowledge of the safe management of chemicals and pesticides should grow over time, thus reducing accidents and illnesses.

Conclusion

The dramatic growth in chemicals production and trade over the past three decades has raised concerns about the risks posed by hazardous chemicals and pesticides. Countries lacking adequate infrastructure to monitor the import and use of these chemicals are particularly vulnerable.

The Rotterdam Convention grew out of voluntary information-exchange programmes developed in the 1980s by the United Nations Environment Programme (UNEP) and the Food and Agricultural Organization (FAO). By the time of the 1992 Earth Summit, Governments and environmental organizations had concluded that mandatory controls should be applied to the trade of some chemicals and pesticides. Governments meeting in Rotterdam, the Netherlands, subsequently adopted the Convention on 10 September 1998. It entered into force on 24 February 2004.

The Convention is one of a series of agreements focusing on chemical safety and is sometimes referred to as a "first line of defense" because it seeks to prevent problems from happening in the first place. Among its companion treaties, the Stockholm Convention is aimed at halting the use of hazardous persistent organic pollutants (POPs) and at coping with their widespread presence in the environment. The Basel Convention targets international trade and the effective management and cleanup of hazardous wastes.

The Rotterdam Convention's provisions for technical assistance to less-wealthy countries will be crucial to its success. Helping less technologically sophisticated nations to "catch up" in their management of chemicals will go some way towards redressing past injustices and will aid in establishing a spirit of international solidarity. Experience has shown that without such solidarity, environmental treaties cannot succeed – countries have to act together and trust each other when addressing health risks and pollution problems that do not respect national borders.

As the world's countries join the Convention and then work together as a team, people everywhere will benefit, and so will the world's plants, birds, animals and oceans. If this kind of cooperation becomes a habit, that can only help, too, with the many other global problems that we face.

HOW INFORMATION EXCHANGE AND THE PIC PROCEDURE WORK

➤ STEP 1

- Notification of final regulatory action to ban or severely restrict a chemical [PARTIES]
- Proposal on severely hazardous pesticide formulation causing problems under condition of use [PARTIES]

- Export Notification [PARTIES]



Information exchange

Prior Inform Consent Procedure

➤ STEP 2

- Decision to make a chemical subject to PIC and list in Annex III [COP]
- Circulation of a decision guidance document to all parties [SECRETARIAT]

➤ STEP 3

- Importing Party responds regarding future import of each PIC chemical [PARTIES]
- Circulation of import responses to all Parties [SECRETARIAT]

➤ STEP 4

- Follow up on importing Party responsibilities [PARTIES]
- Follow up on exporting Party responsibilities [PARTIES]

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