Illegal trade

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# The effectiveness of global chemicals treaties

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The Rotterdam Convention helps ensure that international trade of harmful chemicals is transparent, and it gives parties the right to refuse imports of specific substances. Now a study shows that illegal trade of chemicals listed under the Rotterdam Convention is ongoing alongside legal trade.


**Sign warning people about large-scale agricultural pesticide use in Florida, United States.**

Multiple global environmental agreements cover different steps in the life cycle of hazardous substances from their production to final disposal. Yet, chemicals, including many pesticides, continue to cause much harm to human health and the environment[1]. One of the global chemicals treaties — the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade — provides a mechanism for information sharing and the tracking of exports and imports of listed harmful substances among its current 165 parties. However, reduced chemicals trade or use per se is not an explicit treaty goal. Over time, the parties have added substances to the Rotterdam Convention's list, but this process can be politically contentious[2]. Writing in *Nature Sustainability*, Zou et al. document legal and illegal exports of chemicals under the Rotterdam Convention, through trade-based data related to the operation and effectiveness of the Rotterdam Convention[3].

As many global environmental agreements have matured over the past few decades, parties and policy advocates are asking questions about their effectiveness. Social scientists in the 1990s began to focus on how to define and measure the effectiveness of environmental treaties and regimes[4]. Their contributions show the challenges of demonstrating that a particular environmental treaty influenced specific actions by national governments (and relevant private sector and civil society actors)[5]. For example, a decision to prohibit the import or use of a specific chemical substance may or may not be primarily the result of obligations under a particular treaty, as it could be taken for a whole host of other domestic legal, political and/or economic reasons. Also, some regulatory and administrative actions that parties to a specific environmental agreement have taken could have been taken even in the absence of the treaty.

The Rotterdam Convention facilitates information sharing and sets up a prior informed consent procedure to help protect human health and the environment from potential harm of hazardous chemicals and to contribute to their environmentally sound use. When a party bans or restricts a chemical domestically, it must notify the Rotterdam Convention Secretariat. Developing countries and countries with an economy in transition that are experiencing problems caused by a severely hazardous pesticide formulation may also report such problems to the Secretariat. The Secretariat provides parties with summaries of notifications and reports. When a chemical that is banned or severely restricted by a party is exported from its territory, the same party — under the principle of prior informed consent — must notify the importing party before the first shipment sets off and annually thereafter. Parties have the right to reject imports but must make a formal decision about whether or not they will allow import — this is called import response. For chemicals explicitly listed under the Rotterdam Convention, the prior informed consent procedure for exports and imports applies to all parties.

Global chemicals treaties such as the Montreal Protocol on Substances that Deplete the Ozone Layer and the Stockholm Convention on Persistent Organic Pollutants have been subject to repeated effectiveness evaluations, and the first effectiveness evaluation of the Minamata Convention on Mercury is under way. By contrast, the Rotterdam Convention has not undergone a formal effectiveness evaluation by the parties. A previous study on trade flows of chemicals found that when a country becomes a party to the Rotterdam Convention and abides by its information sharing and prior informed consent requirements, there is a reduction in imports of chemicals covered by the Rotterdam Convention from that party[6]. Zou et al. expand on this work by including a larger number of countries and using mirror analysis when there is a lack of export or import data or data inconsistency[3]. They analyse over 66,000 trade records from the United Nations Comtrade database, as they focus on both legal and illegal trade of 46 chemicals listed under the Rotterdam Convention since it entered into force in 2004 and until 2019.

Zou et al. found that, globally, the total trade flows in the 46 chemicals (involving both parties and non-parties to the Rotterdam Convention) increased during the 15-year time period covered by their analysis, largely because of a growth in trade in one chemical (ethylene dichloride)[3]. During the period 2015–2019, the United States and Middle Eastern countries were major exporters of pesticides and multi-use chemicals while Asian countries were the primary importers of such substances. Central and Western European countries were also large

exporters (and importers) of multi-use chemicals as well as industrial chemicals. While overall trade volumes increased during the period 2004–2019, data show that for over 70% of the number of highly hazardous chemicals included in the study, trade was in fact decreasing. This leads the authors to conclude that the Rotterdam Convention is playing a positive role[3]. However, the analysis cannot quantify this impact, as many factors external to the Rotterdam Convention, including the growing influence of private agricultural standards, can have contributed to this decline[2].

Analysing patterns of illegal chemicals trade, Zou et al. define trade as illegal when a trade takes place between two parties to the Rotterdam Convention after an import response of "no consent" is issued by the importing country[3]. Worryingly, their data show that 40% of the total trade volume of chemicals during the period 2004–2019 fell into the no consent category, involving countries mainly in Europe, the Middle East and Asia (exports from the United States, a non-party to the Rotterdam Convention, are not included in this analysis of illegal trade). Of course, the analysis cannot capture the additional unreported trade when chemicals are intentionally mislabelled and/or smuggled across borders.

Analyses of international chemicals trade are hampered by data limitations, as governments report incomplete and/or incorrect export and import data to the Comtrade database[7]. This data issue is acknowledged by Zou et al., who apply a mirror analysis to help address some data uncertainties[3]. However, the mirror analysis is itself based on certain assumptions and therefore subject to limitations. If for a specific trade flow only one data point for either export or import is available, the missing one is assumed to be the same as the available one, and if the export and import numbers are not the same, the higher one is assumed to be correct. The analysis is also influenced by uncertainties in government reporting of import responses to the Rotterdam Convention Secretariat.

Overall, the article by Zou et al. provides both analysts and decision-makers with a quantitative picture of trade patterns and trends for chemicals listed under the Rotterdam Convention[3]. Further research on why trade continues despite objections to import could help the Rotterdam Convention parties to strengthen treaty implementation and more effectively protect human health and the environment from hazardous substances.

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## Competing interests

The author declares no competing interests.