

# 1. Introduction

Pharmaceuticals, including antibiotics, and their metabolites can enter the environment through a variety of pathways, including wastewater and solid waste from pharmaceutical manufacturing, consumption and excretion, improper disposal of unused or expired products, animal husbandry and aquafarming.



# 2. Why is it relevant?

Pharmaceuticals are important for human and animal health. They have positive impacts on food production and economic welfare. However,



The presence of pharmaceuticals in the environment may result in different adverse effects on wildlife and ecosystems; some well-known cases include endangerment of some vulture species, reproductive failures in fish, and the development of antimicrobial resistance.

Pharmaceuticals designed to be slowly degradable or even non-degradable present a particular risk when they enter, persist or distribute in the environment.



There are also so-called “pseudo-persistent pharmaceutical pollutants”, which are degradable but continuous emissions to the environment can lead to their constant environmental presence.

Due to their increasing use and following increasing attention in both the scientific community and public media, policymakers have initiated various actions to address pharmaceuticals in the environment.



Internationally, EPPPs were recognized as an issue of concern under the Strategic Approach to International Chemicals Management (SAICM) at the fourth meeting of the International Conference on Chemicals Management (ICCM4) in 2015.

The same resolution “considers that information dissemination and awareness raising on EPPP are particularly relevant and that improving the availability of and access to information on such chemicals is a priority” and “recognizes the current knowledge gaps on exposure to and the effects of EPPP.”



# 3. Existing instruments and actions

The sound management of EPPPs is a complex issue: while the focus is on pharmaceutical pollutants in the environment, action needs to be taken at every stage of pharmaceutical products’ life cycles, starting from drug development stages.

## 3. Existing instruments and actions (cont.)

Many efforts by governments and other stakeholders have focused so far on gathering knowledge and raising awareness. For example, there is a database of existing environmental measurements across the globe gathered from peer-reviewed literature.

Declarations and policy strategies have been developed to guide action to address specific pharmaceuticals or in specific regions. In a demonstration of the political commitment to solving potential EPPP issues, some policy strategies have taken the whole life cycle of pharmaceuticals into consideration.

Development of actions or instruments for sound management of individual stages of pharmaceutical life cycles has been uneven. Many different instruments and actions have been developed for areas such as marketing authorisation and take-back of unused and expired pharmaceuticals. Actions remain lacking in other areas, such as treatment of waste from manufacturing and domestic sources containing pharmaceuticals, as well as from prescriptions and use.



## 4. Challenges and opportunities



Under SAICM, the current designation of EPPPs is limited in scope to pharmaceutical pollutants that “are designed to be slowly degradable or even non-degradable” and “resist chemical degradation during passage through the human or animal body.”

Preventing pharmaceuticals from entering waste streams in the first place is an effective solution to sound management, due to the financial and technical challenges associated with the treatment of pharmaceutical pollutants once they become waste. Efforts to tackle different life-cycle stages of pharmaceuticals have been limited in their success.

The specific scope of SAICM needs to be expanded to a more general scope of “pharmaceuticals in the environment” in order to include those pharmaceutical pollutants that are not environmentally persistent. These include those that are pseudo-persistent and those that may cause effects that are difficult to reverse, such as antimicrobial resistance.

Global efforts to prevent pharmaceutical pollutants from entering waste streams need to be stepped up in areas including:

- Strengthened support of developing and transition countries;
- Strengthened engagement of pharmaceutical manufacturers, particularly multinational corporations;
- Filling in assessment and management gaps associated with existing pharmaceutical products.

