



Concept Note
International Network on Soil Pollution (INSOP)
Workshop on Soil Pollution
Hybrid event
January 27-28, 2025

Background:

Soil pollution, recognized as a critical global threat by the FAO's [Intergovernmental Technical Panel on Soils \(ITPS\)](#), poses serious risks to both human health and the environment. Although invisible, soil contaminants infiltrate the food we eat, the water we drink and the air we breathe, spreading through ecosystems and the global economy via production and food chains. This issue is particularly severe in agricultural areas, where soil pollution can directly compromise food safety and human health.

The significance of soil pollution was highlighted in the [Status of the World's Soil Resources Report](#) (2015) by the FAO's Global Soil Partnership (GSP) and ITPS. In response to the growing concern, the FAO, in collaboration with the United Nations Environment Programme (UNEP), published a [Global Assessment of Soil Pollution](#) (2021), detailing the extent of pollution worldwide, its sources, effects, and potential solutions for mitigation and remediation. Following this, the GSP established the [International Network on Soil Pollution \(INSOP\)](#) in 2022. This network, comprising 1 200 members from 130 countries, focuses on four key areas: soil assessment, soil monitoring and regulations, soil remediation, and the impacts of soil pollution on food safety and One Health.

Heavy metals such as cadmium (Cd), copper (Cu), mercury (Hg), lead (Pb), and cobalt (Co) are of particular concern due to their widespread distribution and their toxic effects on living organisms, including humans, even at low concentrations. These metals can bioaccumulate in crops and undergo biomagnification in food chains, ultimately entering the human body through ingestion and adversely affecting health. For instance, Hg can accumulate in tomatoes and rice, Pb in maize, and Cd in wheat and cocoa.

Cocoa, a vital export commodity for many developing countries, is particularly affected by Cd and other heavy metals such as Pb and Cu, which often have relatively high contents in their leaves due to their physiological characteristics. Cocoa beans, used in chocolate production, are dried and fermented locally before export. There is significant interest in addressing Cd levels in cocoa and chocolate from Latin America, especially as importing countries and regions, such as the European Union (EU), have set maximum permitted Cd levels ([EU Regulation 488/2014](#)). Concentrations of Cd in South American cocoa products often exceed these limits, which range from 0.1 to 0.8 mg/kg, affecting the value chain and raising health concerns.



As part of INSOP's initiatives, a pilot project was launched in Trinidad and Tobago and Brazil to assess the risks posed by heavy metals in agricultural soils, particularly in cocoa-growing fields. The project aimed to identify soil management recommendations to manage and minimize the risks of Cd pollution and their accumulation in cocoa and apply Ecosystem-based Solutions (EbS). Emphasizing practical, low-cost strategies, promoting sustainable soil management practices, and carrying out preliminary and detailed site assessments in order to build a conceptual model for the watershed level were the main objectives of the project. Furthermore, the project aimed to guide stakeholders in gathering important data using the FAO soil pollution checklist.

Workshop objectives:

This workshop, jointly organized by the University of West Indies, the Ministry of Agriculture of Trinidad and Tobago, and the project executing agency, Instituto EKOS Brasil, aims to present the results of the detailed site investigation from Trinidad and Tobago and the conceptual site model at the watershed level. Moreover, guest speakers from the FAO Regional Office for Latin America and the Caribbean (FAORLC), smallholder cocoa producers, and intergovernmental organizations will be presenting ongoing projects on soil pollution in the region. These projects include "Conservation of the Atlantic Forest through the sustainable management of cocoa agroforestry landscapes" from Brazil and "Prevention and Reduction of Contaminants in Food in the Amazonian Rainforest" from five South American countries. The joint discussions will enable increased engagement and provide a wider view and set the basis for continued collaboration in order to explore strategies for reducing heavy metals in cocoa beans and chocolate products. Furthermore, field exercises organized by the Global Soil Doctors Programme on soil pollution prevention and risk minimization will be introduced and conducted. The specific objectives of the workshop are as follows:

- Present the results of detailed site investigations conducted in Trinidad and Tobago.
- Share the conceptual site model at the watershed level from Bahia State, Brazil.
- Present national projects from South America and the Caribbean, addressing trace elements pollution in cocoa and chocolate products.
- Discuss environmentally friendly, cost-effective technologies for mitigating pollution risks in cocoa-growing plantations.
- Raise awareness about the impact of soil pollution on cocoa, including related hazards and economic challenges for farmers.

Expected outcome:

- Gain a comprehensive understanding of the extent of heavy metal pollution in agricultural soils, particularly in cocoa-growing regions in South America and the Caribbean, and its impact on food safety and human health.
- Enhance knowledge of environmentally friendly, cost-effective technologies and EbS for mitigating agricultural soils.



- Encourage stakeholders to develop and implement strategic action plans to address soil pollution in their respective regions, informed by the findings from Trinidad and Tobago and Brazil.
- Strengthen the network among participants, fostering collaboration on ongoing and future projects aimed at reducing soil pollution and promoting sustainable soil management in South America and the Caribbean.

