

## **HOW SAFE IS THE USE OF RECLAIMED WATER AND SEWAGE SLUDGE IN AGRICULTURE? THE NORMAN DATABASE SYSTEM AS AN INFORMATION AND DECISION TOOL FOR CONTAMINANTS OF EMERGING CONCERN**

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### **INTRODUCTION**

The reuse of treated municipal wastewater ('reclaimed water') and sewage sludge in agriculture is promoted by the EU within its New Circular Economy Action Plan (2020). However, in addition to containing nutrients and organic matter, reclaimed water and sludge may also contain a range of contaminants and so their use in agriculture is regulated to prevent harmful effects on people and the environment by the Sewage Sludge Directive (SSD; 86/278/EEC) and the Regulation (EU) 2020/741 on minimum requirements for water reuse or RMRWR (Regulation on minimum requirements for water reuse). Both pieces of legislation set limits for a range of microbiological and physicochemical parameters (and for seven heavy metals, in the SSD) but the inclusion of contaminants of emerging concern (CECs) in terms of prioritisation and determination of threshold values is missing. In order to support the current EC evaluation of the SSD as well as the entry into force of the RMRWR in 2023, the 'Water reuse and policy support' working group of the NORMAN network has launched a new initiative to collect and disseminate data on CECs in reused environmental matrices including sewage sludge and reclaimed water reused in farming.

### **METHODOLOGY**

The NORMAN network, which today counts among its membership more than 90 environmental research organisations, reference laboratories and governmental institutions, is supporting the systematic collection and archiving of data on the occurrence of CECs in all environmental matrices into their EMPODAT database (<https://www.norman-network.com/nds/empodat/>). At the same time, the network is collecting ecotoxicological data to support derivation of threshold values to protect the exposed organisms, in the Ecotoxicology Database (ECOTOX; <https://www.norman-network.com/nds/ecotox/>). In combination, data on occurrence and threshold values enable prioritisation of CECs using an automated risk-based approach embedded within the NORMAN Database System. The integration of new data on reclaimed water/sewage sludge reused in farming and exposed soils/crops within existing databases has required an upgrade of both EMPODAT and ECOTOX. This includes the creation of new categories and templates to collect

mandatory information on the reuse categories or practices for a wider range of environmental matrices and detailed information on protection target(s) covered by the threshold values.

## RESULTS

A first activity has focussed on the integration, within the ECOTOX database, of new regulatory threshold values (beyond EU EQS values) from international institutions (e.g. CCME, US EPA, WHO) for irrigation water and agricultural soils. Most of them have been derived for a limited list of heavy metals, metalloids and pesticides (herbicides). These data are then reviewed to identify the protection target(s) addressed and the methodology used for their derivation, with the ambition of adapting current approaches/methodologies to develop quality targets for CECs in irrigation water and sewage sludge that are currently missing. A second activity consisted of launching a survey, in summer 2021, among the NORMAN community to identify and characterise existing datasets related to reuse practices in environmental matrices. The results show that several Southern (Cyprus and Spain) and Northern (Belgium and Sweden) EU countries are willing to share occurrence and, to a lesser extent, threshold datasets on reclaimed water/sewage sludge (reused in agriculture) and exposed soils/crops through the NORMAN Database System.

## DISCUSSION

By the end of 2021, the working group will define the necessary amendments to the databases in order to allow a proper use of the data by the stakeholders and to support a robust prioritisation of CECs in relation to the safe use of reclaimed water and sewage sludge in farming. It is anticipated that the new datasets will be made publicly available by 2022 together with the results of the first prioritisation exercise. Additionally, a review of existing entries in EMPODAT (which contains e.g. 14 746 entries classified as 'Wastewater-other', 1 938 entries classified as 'Sewage sludge-Other' and 800 entries categorised as 'Sewage sludge-Municipal') is foreseen, in order to identify potential associated reuse practices and assess, retrospectively, their risks.