

Agricultural Use of Sewage Sludge as a Threat of Microplastic (MP) Spread in the Environment

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Table S1. Literature focused on addressing MP in SS.

Summary	Reference
Reviews the existing legislative frameworks and policies on SS management in developed countries such as the USA, Japan, Australia, New Zealand and the European Union (EU27).	Christodoulou, A. and Stamatelatos, K. 2016. Overview of legislation on sewage sludge management in developed countries worldwide. <i>Water Science and Technology</i> , 73(3), pp.453-62.
Reviews existing and emerging EU policy frameworks that have implications for resource recovery from wastewater. Identification of potential barriers to the uptake of more 'circular' approaches.	Smith H.,M., Fantinel F., 2017. Realising the circular economy in wastewater infrastructure-the role of governance. International Symposium for Next Generation Infrastructure, September 2017, London, UK
Compares different approaches provided by the European Member states for the reuse of SS in agriculture. Particular focus on Italian legislation.	Collivignarelli, M.C., Abbà, A., Frattarola, A., Carnevale Miino, M., Padovani, S., Katsoyiannis, I. and Torretta, V. 2019. Legislation for the Reuse of Biosolids on Agricultural Land in Europe: Overview. <i>Sustainability</i> , 11, 6015.
SS acting as a MP store. Specific regulations for the agricultural use of SS with particular focus on German regulation.	Stubenrauch, J. and Ekardt, F. 2020. Plastic Pollution in Soils: Governance Approaches to Foster Soil Health and Closed Nutrient Cycles. <i>Environments</i> , 7, 38.
The review focuses on the contemporary global MP research with respect to research opportunities and related challenges of MP for the soil and terrestrial ecosystem from a Bangladesh perspective.	Sarker, A., Deepo, D. M., Nandi, R., Rana, J., Islam, S., Rahman, S., ... & Kim, J. E., 2020. A review of microplastics pollution in the soil and terrestrial ecosystems: A global and Bangladesh perspective. <i>Science of the Total Environment</i> , 733, 139296.
Scarce harmonisation of legislative frameworks regarding sludge use in agriculture amongst EU countries. Limits for pollutants and pathogens in sludge and emerging.	Gianico, A., Braguglia, C.M., Gallipoli, A., Montecchio, D. and Mininni, G. 2021. Land Application of Biosolids in Europe: Possibilities, Con-Strains and Future Perspectives. <i>Water</i> , 13, 103.
Reviews new developments in the methods for MP analysis in SS, major polymer types and shapes in SS and the risks concerned with agricultural usage of SS in the soil environment.	Koyuncuoğlu, P. and Erden, G. 2021. Sampling, pre-treatment, and identification methods of microplastics in sewage sludge and their effects in agricultural soils: a review. <i>Environmental Monitoring and Assessment</i> , 193(4), pp.1-28.
Reviews MPs in sludge worldwide, the methods for MP analysis and identifies the fate and transport of MPs in the environment as a result of sludge disposal and reuse.	Rolsky, C., Kelkar, V., Driver, E., and Halden, R.U. 2020. Municipal sewage sludge as a source of microplastics in the environment. <i>Current Opinion in Environmental Science & Health</i> , 14, pp.16-22.

Table S2. Search terms used for literature search. The latest search was conducted on 1 February 2021; databases used PubMed, ScienceDirect, Research Gate.

Sewage Sludge Descriptor	Sewage Sludge OR Biosolids OR Human Manure
Microplastic descriptor	microplastic OR plastic OR nanoplastic OR polymer OR emerging contaminant OR persistent organic pollutant OR contamination in agricultural soils OR polypropylene OR polyethylene OR polyester OR polyvinylchloride OR polyurethane OR polyethylene terephthalate OR polystyrene OR polyamide OR polyethersulfone
Soil descriptor	soil OR agricultural land OR agricultural soils OR farmland OR farms OR land OR
Pre-treatment descriptor	pre-treatment OR stabilised OR anaerobic digestion OR compost OR thermal treatment OR dewatered OR sewage sludge treatment OR biosolid treatment OR conventional thermophilic compost OR hyperthermophilic compost
Other descriptors used	wastewater treatment, wastewater, influent, effluent, soil amendments, alternative management, incineration, sewage sludge ash, circular economy, phosphorus, Fourier transform infrared, regenerative agriculture, conservation agriculture, loss on ignition, life cycle assessment