09/08/2022

Submission of the Food and Agriculture Organization of the United Nations (FAO) to the Intergovernmental Negotiating Committee (INC)

First Meeting of the INC to develop an International Legally Binding Instrument on Plastic Pollution, including in the Marine Environment
Uruguay, 28 November-2 December 2022

(ii) Substantive issues, which would contribute to preparation of documentation for INC-1, in particular, regarding potential elements of the future instrument as well as priorities, needs, challenges and barriers and overview of national measures.

Key messages:

- *Plastic products are used throughout agrifood system value chains, from production to consumption[1]. Whilst they can play a role in improving food security and food safety, their mismanagement threatens both and the natural resources upon which they rely.*
- *Solutions to sustainable management of plastics used in agriculture lie in a systemic application of the 6Rs approach: Refuse, Re-design, Reduce, Reuse, Recycle and Recover. Management options should be assessed for each application and in specific contexts in a holistic manner using life-cycle approaches.*
- *A number of legislative measures, policy frameworks and schemes can facilitate good management practices aimed at preventing the release of plastics used in agriculture and fisheries into the environment and simultaneously improving sustainability and circularity. These include: international conventions, codes of conduct, and guidelines; national and regional legislation; extended producer responsibility schemes; bans on the use of selected products/plastic polymers; product standards and certifications; minimized barriers, incentives, effective and timely enforcement and penalties to drive more sustainable behaviors for users and consumers; and agricultural practices and supply chain assurance schemes.*
- *The FAO's Committee on Agriculture (COAG) recommended FAO, subject to further assessments and availability of resources, and through inclusive and transparent consultations with Members and relevant stakeholders, to develop a Voluntary Code of Conduct on the sustainable use of plastics in agriculture taking into account the UNEA 5.2 Resolution (UNEP/EA.5/Res.14), and to present the draft Code for consideration at the 29th session of COAG in 2024.*
- *Developing an international legally binding treaty that can help balance the benefits and trade-offs of plastics used in food and agriculture sectors and tackle wider plastic pollution will mark a crucial step towards achieving sustainable food security for the planet.*

[1] Agricultural sectors include crop production, livestock, fisheries and aquaculture, and forestry.

Plastic has become an integral part of agrifood systems; it increased crop productivity for farmers, while reducing water demand and use of agrochemicals. Introduction of plastic-coated fertilizers improved nutrient management. Greenhouses and tunnels extended growing seasons and gave farmers access to new markets; plastic use has also reduced food loss and waste.

However, growing body of evidence shows that poor design, selection, usage, and end-of-life management of plastic in agriculture leads to adverse impacts in the source-to-sea continuum from terrestrial to marine ecosystems.

FAO estimated that in 2019, agricultural production used **12.5 million tonnes** of plastic, of which the crop production and livestock sectors, together contributed 10 million tonnes, followed by fisheries and aquaculture with 2.1 million tonnes and forestry with 0.2 million tonnes. Additional 37.3 million tonnes were used in food packaging annually, with the majority falling under the single-use category. Films are the largest category used in terrestrial agriculture for greenhouses, mulching and silage. The use of plastic films is projected to increase by about 50% in this decade.

Data suggest that a significant amount of plastic products used in agriculture becomes waste or is leaked to the environment, while only a small fraction is recycled.[2] Often farmers do not have the capacity for selection, application, and retrieval needed for adequate plastic management, nor do they have access to sound environmental end-of-life services and infrastructure.Other actors of the food chain, such as producers and distributors, do not have clear guidance or requirements to facilitate a sustainable management of the plastics life cycle.

Plastics used in agrifood systems are increasingly becoming a major source of contamination for terrestrial and aquatic ecosystems. An example of the latter is abandoned, lost and otherwise discarded fishing gear (ALDFG), which is considered to be one of the most harmful forms of marine litter, although current data and knowledge gaps prevents accurate estimation of contribution of ALDFG to the pollution of aquatic environments.[3] Efforts within FAO are addressing these data gaps through the design and implementation of standardized ALDFG surveys. In case of terrestrial ecosystems, evidence suggests that high concentrations of plastics in soils result in decreased crop yields, jeopardizing food security.

The majority of plastics are derived from fossil-based sources and contribute to global greenhouse gas emissions. In addition, the price of plastic does not reflect adequately the externalized costs of its production and disposal, especially related to the negative impacts on the environment, including the loss of ecosystem services. A 2021 report[4] estimates that the actual cost that the plastic produced in 2019 will incur over its lifetime is 10 times higher than its market price.

Plastics can degrade into microplastics, which pose an increasing concern through their potential to accumulate in food chains, with impacts on food safety and human health still poorly understood.[5]

---

[2] FAO. 2021. Assessment of agricultural plastics and their sustainability. A call for action. Rome. https://doi.org/10.4060/cb7856en

[3] GESAMP (2021). "Sea-based sources of marine litter", (Gilardi, K., ed.) (IMO/FAO/UNESCO-IOC/UNIDO/WMO/IAEA/UN/UNEP/UNDP/ISA Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection). Rep. Stud. GESAMP No. 108, 109 p. http://www.gesamp.org/publications/sea-based- sources-of-marine-litter

[4] DeWit, W., Burns, E. T., Guinchard, J. C., & Ahmed, N. (2021). Plastics: The Costs to Society, the Environment, and the Economy. *World Wide Fund for Nature: Gland, Switzerland*.

[5] Lusher, A.L.; Hollman, P.C.H.; Mendoza-Hill, J.J. 2017. Microplastics in fisheries and aquaculture: status of knowledge on their occurrence and implications for aquatic organisms and food safety. FAO Fisheries and

The application of sewage sludge as a fertilizer is a pathway for microplastic contamination of agricultural soils.[6] A study has estimated that 64 000 tonnes of microplastics are released annually into soils in Australia, China, the European Union and North America combined through the application of sewage sludge.[7]

The FAO (2021)[8] study identified existing knowledge gaps and suggested areas for further research, including: (i) global flows and fates of agricultural plastics; their quantities, composition, where and how they are used, their environmental fate throughout the supply chain, during use and at end-of-life; (ii) life cycle assessments of fossil-based and bio-based agricultural plastics; (iii) pathways and impacts of plastics, micro- and nanoplastics, on agroecosystems, food safety and human health; and (iv) behaviour and rate of degradation of biodegradable products.

Strong scientific evidence shows that plastics in agriculture can be both beneficial and also detrimental to food security and food safety. There is no silver bullet solution to this complex problem. Many of the solutions lie in a systemic application of the 6Rs approach (life-cycle approach): Refuse, Re-design, Reduce, Reuse, Recycle and Recover. Management options throughout agrifood systems should be assessed for each particular application and in specific contexts in a holistic manner using life-cycle approaches, followed by the development of new solutions. Depending on the application, these could include: adopting agricultural practices that avoid the use of plastic; eliminating the most polluting plastic products; substituting select plastic products with natural or biodegradable alternatives; promoting reusable plastic products; improving waste management practices; adopting new business models; establishing and enforcing mandatory extended producer responsibility schemes for collection and sound environmental management of agricultural plastics; and establishing fiscal measures and incentives to drive behavioral change within the supply chain, and among users and consumers.

Based on a review of the existing global legal, policy and management frameworks, FAO's 2021 study[9] concluded that there is no overarching international policy or legislative instrument that addresses all aspects of the use of plastics in all agricultural sectors **holistically**, in a manner that allows to balance its environmental and socio-economic benefits with the trade-offs. FAO is completing a global report mapping and identifying gaps in the international, regional and national legally binding and non-binding instruments that may influence regulations of plastics used in agriculture.[10]

A number of legislative measures, policy frameworks and schemes can facilitate good management practices aimed at preventing the release of plastics used in agriculture into the environment and simultaneously improving sustainability and circularity. These include: international conventions, codes of conduct, and guidelines; national and regional legislation;

Aquaculture Technical Paper. No. 615. Rome, Italy. https://www.fao.org/3/i7677e/i7677e.pdf

[6] https://www.unep.org/news-and-stories/story/how-plastic-infiltrating-worlds-soils

[7] Microplastics and pollutants in biosolids have contaminated agricultural soils: An analytical study and a proposal to cease the use of biosolids in farmlands and utilize them in sustainable bricks Mohajerani A. and Karabatak B. 2020. https://doi.org/10.1016/j.wasman.2020.04.021

[8] FAO (2021). Assessment of agricultural plastics and their sustainability. A call for action. Rome. https://doi.org/10.4060/cb7856en

[9] Chapter 6: Current frameworks and mechanisms to facilitate good management practices in FAO (2021). Assessment of agricultural plastics and their sustainability. A call for action. Rome. https://doi.org/10.4060/cb7856en

[10] FAO (2022). Assessment of the gaps and opportunities within existing governance frameworks relevant to plastics used in agriculture, forthcoming.

extended producer responsibility schemes; bans on the use of selected products/plastic polymers; product standards and certifications; incentives, effective and timely enforcement and penalties to drive more sustainable behaviors; and agricultural practices and supply chain assurance schemes. Each measure has its own advantages and corresponding disadvantages, and some have been shown to be particularly effective in managing plastics used in agriculture. Moreover, these measures need not operate in isolation, as there is significant overlap in their scope and implementation.

FAO supports the need for scaling up collaboration and coordination efforts combating plastic and microplastic pollution among all relevant stakeholders. The Organization has a long track record of working on marine litter through the Ecosystem Approach to Fisheries - Nansen Programme[11], an initiative funded by NORAD and operated by FAO in collaboration with the Institute of Marine Research Bergen, where research on mapping the distribution and impacts of marine litter and microplastics forms a key component. Another example is the GloLitter Partnerships project implemented by the International Maritime Organization (IMO) and FAO and funded by Norway, Australia and Saudi Arabia. The project focuses on addressing marine plastic litter from the maritime transport and fishing sectors through supporting the implementation of relevant international instruments[12].

Apart from the guidance on the management of empty pesticide containers and fishing gear under the International Code of Conduct on Pesticide Management, the Code of Conduct for Responsible Fisheries, and the Voluntary Guidelines on the Marking of Fishing Gear, FAO does not provide any specific and overarching guidance on sustainable and circular use of plastics in agriculture. Existing FAO's voluntary guidelines do not specifically address the trade-offs or life cycle implications of plastics use, nor do they provide recommendations for the sustainable management of plastics in agricultural sectors and value chains.

To address the gaps, the FAO Committee on Agriculture (COAG) at its 28th session meeting on 18-22 July 2022 discussed the issue of plastics used in agriculture[13]. The Committee *encouraged* FAO to undertake further assessments related to distribution, benefits, trade-offs, and risks of plastics for agricultural use and their alternatives, and to support Members in the development of policy instruments. It *recommended* FAO, subject to further assessments and availability of resources, and through inclusive and transparent consultations with Members and relevant stakeholders, *to develop* a Voluntary Code of Conduct on the sustainable use of plastics in agriculture, taking into account the UNEA 5.2 Resolution (UNEP/EA.5/Res.14), and to present the draft Code for consideration at the 29th session of COAG.

The negotiating committee for the new international plastics treaty is tasked with considering the obligations, measures, and voluntary approaches to be included in the new global agreement that would support achieving the objectives to be agreed (UNEA Res. 4/15, para 4a). A global Code of Conduct for the sustainable use of agricultural plastics would be a valuable voluntary tool in supporting this aim, including the goals of the resolution in working towards resource efficiency and circular economies. The Code of Conduct could be informing some of the implementation measures of the new agreement by offering concrete guidelines, best practices, and indicators; and providing perspectives from a key sector that may be applicable to other plastic sectors.

[11] https://www.fao.org/in-action/eaf-nansen/areasofwork/science/en/
[12] https://www.fao.org/documents/card/en/c/CA3546T/
[13] Report of the 28th Session of the Committee on Agriculture (18-22 July 2022), forthcoming.

Tackling plastic pollution in agriculture is paramount to achieving more efficient, inclusive, resilient and sustainable agrifood systems. As a specialized agency of the United Nations leading international efforts to achieve food security and nutrition, FAO aims to continue playing an important role dealing with the issue of plastics used in agriculture. The Organization will promote a holistic approach that covers all plastics in the food and agriculture sectors,including marine plastics and provide technical support where needed to promote effective governance, research and innovation to find suitable solutions for people and the environment. Summary of FAO's activities addressing sustainable management of agricultural plastics is provided in Annex 1.

(iii) The content and considerations for the preparation of the forum as set out in the OEWG information document entitled 'Preparations for the forum' (UNEP/PP/OEWG/1/INF/4)

The forum should include voices of relevant stakeholders on benefits, trade-offs, and risks of plastics for agricultural use and their alternatives, highlight global and national policy and governance policy instruments and how to address plastics use throughout agrifood systems in a systemic manner using life-cycle approaches and sustainable agricultural practices.

Global plastics pollution is a transboundary phenomenon impacting all countries, with pollution occurring along the whole life cycle of plastics. The impacts of plastic pollution on land and in the sea at social, health and human rights levels are disproportionately felt by low-income communities exposed to hazardous chemicals linked to plastic production, incineration and waste dumps/open burning of plastic waste.

Solutions to plastics pollution in agriculture require simultaneous mobilization of policies, technologies, sustainable practices, and multiple stakeholder efforts using principles of circular economy that balance benefits and trade-offs of plastics use. These can only be found as part of a transformation of agrifood systems across all three dimensions of sustainability – social, economic and environmental.

Annex 1: FAO work on Plastics Management and Pollution

1. Plastics used in terrestrial agriculture

Responsible teams: Office of Climate Change, Biodiversity and Environment (OCB). Focal points: Lev Neretin lev.neretin@fao.org , Richard Thompson Richard.Thompson@fao.org, and Giulia Carcasci giulia.carcasci@fao.org. Development Law Service (LEGN). Focal points: Carmen Bullon Carmen.Bullon@fao.org and Teemu Viinikaine Teemu.Viinikainen@fao.org.

The use of plastic products in today's agriculture is becoming increasingly commonplace. Plastics used in agriculture bring many benefits, increasing efficiency of water and pesticide use, and reducing food loss. However, they pose aserious risk of harm to human and ecosystem health when they are left polluting our soils.

In December 2021, the team released the report *Assessment of agricultural plastics and their sustainability: A call for action*. This is the first comprehensive report on plastics used in agriculture ever published, and received wide media coverage and interest from general public and stakeholders. The team is active in the following work areas:

- International policies dialogues: the FAO report recommended a two-pronged approach: engage with the international treaty process, and simultaneously develop voluntary instruments. In this sense, the 28th Session of the Committee on Agriculture (COAG 28) met in July to discuss the opportunity to mandate FAO with the development of a Voluntary Code of Conduct on management, deliberating on agenda item 3.4 "Guidance on use of agricultural plastics".
- Country support: in collaboration with the FAO Plant Production and Protection Division, the teamis executing the GEF FARM Project, with the aim of improving agrochemicals and AGP reduction and management in Uruguay and Kenya.

The Development Law Service (LEGN) supports OCB in the identification and development of legal issues and options to control and manage plastics used in agriculture. In this respect, LEGN has supported the development of background draft documents for COAG identifying the regulatory challenges and opportunities in developing a non-binding regulatory instrument tackling plastics used in agriculture. LEGN is also contributing to the development of an "Assessment of the gaps and opportunities within existing governance frameworks relevant to plastics used in agriculture" undertaken by the University of Wollongong. Finally, LEGN supports the implementation of a regional project on pesticide legislation in Central Asia that includes a component of waste management, aimed at identifying common solutions to tackle the handling of pesticide containers, and will support the implementation of a GEF project preparation grant in Kenya and Uruguay that will explore concrete regulatory solutions to tackle plastics used in agriculture. In the context of this last project,LEGN will prepare a Legal Paper on legal options for countries to regulate plastics used in agriculture.

2. Marine plastic litter in fisheries and aquaculture

Responsible team: Fisheries and Aquaculture Division (NFI). Focal point: Amparo Perez Roda, Amparo.PerezRoda@fao.org

FAO has a long track record of working on marine litter through the Ecosystem Approach to Fisheries - Nansen Programme, an initiative funded by Norad and operated by FAO in collaboration with the Institute of Marine Research Bergen, where research on mapping the distribution and impacts of marine litter and microplastics forms a key component. An example is the ongoing study on the social, economic and ecological impact of marine litter on the beach-seine fisheries of four countries in West Africa (Benin, Côte d'Ivoire, Ghana and Togo). The results of the study will be used to support improvements in both fisheries management and waste management, working with local and regional partners.

Another example of collaboration in this area is the GloLitter Partnerships project implemented by the International Maritime Organization (IMO) and FAO (NFIFO and LEGN) and funded by Norway, Australia and Saudi Arabia. The project focuses on addressing marine plastic litter from the maritime transport and fishing sectors through supporting the implementation of relevant international instruments like MARPOL Annex V, the London Convention/London Protocol and the Voluntary Guidelines for the Marking of Fishing Gear (VGMFG). Furthermore, FAO and IMO co-host the GESAMP Working Group 43 on Sea-based Sources of Marine Litter with the support of UNEP.

The report of GESAMP Working Group 43 provides an overview of the current state of knowledge in terms of the sources, relative contribution and data gaps when it comes to sea-based sources of marine litter. Based on the recommendations from the WG, FAO has developed a series of standardized questionnaires and a methodology to implement a global survey on abandoned, lost or otherwise discard fishing gear (ALDFG). Data is being collected through surveys of fishers and/or representatives and stored in a database for further analysis and synthesis estimates of gear loss as well as for mapping spatial and temporal distribution of gear loss. The survey data also includes causes of gear loss, good practices to avoid gear loss, end-of-life fishing gear and marine plastic waste management and fishers' views on ALDFG.

3. Plastics and food safety

Responsible teams: Food Systems and Food Safety Division (ESF), with the Fisheries and Aquaculture Division (NFI). Focal points: Vittorio Fattori vittorio.fattori@fao.org Keya Mukherjee keya.mukherjee@fao.org and Esther Garrido Gamarro, esther.garridogamarro@fao.org

Since food supply chains often involve moving food products across long distances, plastic packaging of food act as barriers for contamination thereby prolonging the shelf-life, preserving the quality and maintaining the safety of food products, as well as providing a placeholder for displaying nutritional information to consumers. However, plastic food packaging is engineered for function and in most cases tend to be used only once, with generally no appropriate end-of-life management processes in place contributing to the issue of plastic pollution.

- ESF released a well-received report that explored various emerging issues in food safety including some of the food safety implications associated with applying circular economy approaches to plastic food packaging.
- Microplastics and nanoplastics can be transferred along the entire food web and eventually reach our plates. A report that provides a deep dive on the impacts of microplastics and nanoplastics, originating from our diets, on the human gut microbiome, and therefore on health and well-being, is being finalized.
- ESF, in collaboration with private partners, is developing a report that explores some of the food safety concerns arising from substances migrating from food contact materials in plastic food packaging.
- Under the lead of the Fisheries and Aquaculture Division (NFI), FAO developed a report compiling information on the occurrence of microplastics in all commodities, microplastic contamination along food value chains, plastic migration from food contact materials and packaging, including a review of the existing literature on the toxicity of the most common plastic monomers, polymers, and additives. The report was consolidated during an expert meeting held in January 2022 and will be published in the latter half of 2022. This process set up the basis for future risk assessment exercises andprovided information that can be used for the formulation of risk management options. The new report complements an effort made in 2017, when the Fisheries and Aquaculture Division (NFI) published an FAO Report titled: *Microplastics in fisheries and aquaculture: status of knowledge on their occurrence and implications for aquatic organisms and food safety*.

4. Soil pollution

Responsible team: Land and Water Division (NSL), Global Soil Partnership (GSP). Focal point: Natalia Rodríguez Eugenio, Natalia.rodriguezeugenio@fao.org.

There are multiple sources of soil pollution that threaten soil health and the provision of ecosystem services including the provision of safe food. Soils are one of the largest planetary reservoirs of plastics (micro and nanoplastics). The burial of waste, leachates from poorly managed landfills, the use of wastewater for irrigation or directly discharged into the environment, or the application of sewage sludge as soil amendments are potential sources of micro and nanoplastics. Due to the high resistance to degradation and improper disposal, plastics can reach water bodies and soils and persist in the environment for decades. In addition to the potential damage of micro and nanoplastics to soil functioning and health, these microplastics may be associated with pathogens and other organisms or enriched in pesticides and trace elements, besides all the chemicals that make up the polymers and additives in the plastic, increasing ecotoxicity.

The Global Soil Partnership and UNEP published in June 2021 the Global Assessment of Soil Pollution reportthat address plastic pollution among other contaminants and the risk those pose to human and environmental health. This report was prepared in response to the request of the UNEA3 resolution 3/6: Managing soil pollution for sustainable development.

The Global Soil Partnership has recently established the International Network on Soil Pollution (INSOP) to work towards stopping soil pollution and achieving the global goal of Zero Pollution. INSOP will work to improve knowledge on the full cycle of soil pollution, from assessment to remediation. It will also strengthen technical capacities and legislative frameworks for the prevention of soil pollution and promotethe exchange of experiences and technologies for the sustainable management and remediation of polluted soils.