



Food and Agriculture
Organization of the
United Nations

A Provisional Voluntary Code of Conduct on the **Sustainable Use and Management of Plastics in Agriculture**



DISCLAIMER

The 29th Session of the FAO's Committee on Agriculture (COAG) (Rome, 30 September – 4 October 2024), *inter alia*, welcomed the work of FAO; considered with appreciation the proposed *Voluntary Code of Conduct on the Sustainable Use and Management of Plastics in Agriculture (VCoC)* in response to the recommendations of the 28th Session of COAG; recommended* the continuation of the process to further develop the proposed document, in consultation with Members, including after the adoption of a legally binding agreement on plastic pollution, for further consideration and endorsement at a future Council Session, while acknowledging Members' decisions to utilize the proposed VCoC in their national contexts, in the meantime, if they wish to do so; and invited FAO to support Members, upon their request, to provide technical assistance on the sustainable use of plastics in agriculture (C 2025/21).

* Argentina and Brazil are able to join consensus on endorsing the conclusions for this Agenda item, with the understanding that the draft Voluntary Code of Conduct on the Sustainable Use and Management of Plastics in Agriculture was not endorsed by the Committee on Agriculture in its 29th Session. The current version of the draft Voluntary Code of Conduct and any future amendments do not set any kind of precedent for the deliberations of the Intergovernmental Negotiating Committee (INC) in charge of developing an internationally legally binding instrument (ILBI) on plastic pollution, including the marine environment, established by the United Nations Environment Assembly Resolution UNEP/EA.5/Res. 14.

The proposed VCoC is available for countries and other stakeholders to use in the context of the decision made at the 29th Session of the FAO's Committee on Agriculture (COAG).

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**Sustainable Use and Management of
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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

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INTRODUCTION

Background

FAO estimates that at least 12.5 million tonnes of plastics were used globally in agricultural production in 2019. The crop production and livestock sectors are the largest users, accounting for 10 million tonnes per year, followed by fisheries and aquaculture with 2.1 million tonnes, and forestry with 0.2 million tonnes. The agriculture plastic industry forecasts the global demand for greenhouse, mulching, and silage films will increase by 50 percent from 6.1 million tonnes in 2018 to 9.5 million tonnes in 2030 (FAO, 2021a).

There are many benefits of using plastic products in agriculture. They play a crucial role in increased productivity, extended growing seasons, reduced water consumption, and reduced use of pesticides and fertilizers. Polymer-coated controlled release fertilizers increase nutrient uptake by plants, reducing emissions in the environment. Use of plastic products in agriculture contributes to water conservation, weed control, protection from extreme weather-related hazards and climate change impacts, and optimization of transportation costs in crop production as well as aiding in the fermentation of grasses for animal fodder and reducing spoilage of feed. The economic benefits of plastic products used in agriculture include increased income for producers, higher-quality produce, and result in savings on resources and infrastructure (FAO, 2021a).

While many plastic products used in agriculture are designed for optimal performance, incorporating elements such as mixed polymers and complex coatings for enhanced functionality, there is insufficient attention in considering their circular management, leading to missed opportunities for sustainable practices in line with the circular economy approaches. Once abandoned, lost, or discarded in the environment, they may pose significant risks to the environment and people. Only a small portion of plastic products used in agriculture is collected and recycled worldwide, primarily in developed countries. Often plastic products used in agriculture are either incinerated, buried, or dumped in landfills. Recycling at the end of their life cycle is limited due to high levels of contamination by soil, moisture, plant residues, and hazardous substances, including pesticides, as well as costs (FAO, 2021a). Open burning of plastic waste in agriculture persists, exposing workers and communities to harmful substances like dioxins, furans, and mercury (Pathak *et al.*, 2023). Regardless of their intended purpose, plastics used in agriculture can have both indirect and direct negative impacts when they enter the environment. The impacts of plastic pollution are increasingly evident – altering habitats and ecosystems processes, affecting biodiversity, people’s livelihoods, food production capabilities, and social well-being. The impacts could be indirect, as seen in emissions of greenhouse gases throughout the entire plastic life cycle.

Plastic pollution can lead to changes in critical soil properties, such as carbon and nutrient cycling, as well as uptake into plants and crops, raising potential risks to food safety and security. Larger plastic residues in terrestrial and aquatic environments can harm organisms through entanglement and ingestion.

The *FAO Assessment of Agricultural Plastics and their Sustainability* identified alternatives and interventions to improve the circularity and sound management of agricultural plastics based on the 6R model (Refuse, Redesign, Reduce, Reuse, Recycle, and Recover). In any waste management policy, plastic waste prevention should be the preferred option (FAO, 2021a).

Solutions to ending plastic pollution in agriculture should be an integral part of agrifood systems transformation to make them more efficient, inclusive, resilient, and sustainable. Seven interconnected goals should guide the development and implementation of these solutions:

- i.** contributing to food security in all its dimensions;
- ii.** encouraging the reduction of the use of plastics used in agriculture that pose risk to the environment or human health, where possible;
- iii.** ensuring that plastic products used in agriculture are designed with a focus on their sustainability and circularity;
- iv.** promoting sustainable use and management of plastics in agriculture through appropriate labelling, application, use, storage and disposal;
- v.** eliminating leakage and releases to the environment from mismanaged plastic waste in agriculture, illegal dumping and burning of plastic products used in agriculture by promoting environmentally sound management of plastic waste, including collection, recycling, and, in cases where the waste is not recyclable, recovery or final disposal;
- vi.** ensuring the fair, equitable and inclusive participation and consideration of the needs of affected populations, with special considerations for small-holder farmers, women, children and youth, Indigenous Peoples, persons with disabilities, groups in vulnerable situations in rural areas as well as all relevant stakeholders in the agrifood systems, including waste pickers;
- vii.** promoting international cooperation through capacity-building and transfer of technology on voluntary and mutually agreed terms from developed to developing countries, aimed at helping the latter achieve the previous goals, including through the development and adoption at scale of safer and more environmentally sound plastic alternatives and substitutes in agriculture.

To address the unprecedented challenges faced by agrifood systems, FAO has developed the Voluntary Code of Conduct on the Sustainable Use and Management of Plastics in Agriculture (VCoC) at the request of its Members. The development of the VCoC took place from July 2022 to June 2024. The VCoC aims to provide voluntary guidance for all agricultural sub-sectors, taking into account the need to secure sustainable agrifood systems around the globe. The VCoC does not overlap or conflict with the international legally binding instrument under development. The development of the VCoC coincided with the work of the Intergovernmental Negotiating Committee (INC) to develop an international legally binding instrument on plastic pollution, including in the marine environment, which was established following the United Nations Environment Assembly resolution *End plastic pollution: towards an international legally binding instrument* (UNEP/EA.5/Res.14) (UNEP, 2022) and could support its implementation within the agriculture sector. The development of the VCoC took into consideration the UNEA 5/14 Resolution.

The VCoC is aligned with the FAO Strategic Framework 2022-31 (FAO, 2021b), which seeks to support the 2030 Agenda for Sustainable Development through the transformation to more efficient, inclusive, resilient, and sustainable agrifood systems for *better production, better nutrition, a better environment, and a better life*, leaving no one behind. Additionally, the VCoC will contribute to several Sustainable Development Goals (SDGs), including SDG 2 (Zero Hunger), SDG 3 (Good Health and Well-being), SDG 6 (Clean Water and Sanitation), SDG 11 (Sustainable Cities and Communities), SDG 12 (Responsible Consumption and Production), SDG 13 (Climate Action), SDG 14 (Life below Water), SDG 15 (Life on Land), and SDG 17 (Partnerships for the Goals). The VCoC contributes to the achievement of the goals of FAO's Strategies and relevant Action Plans on Climate Change (FAO,2022b), Mainstreaming Biodiversity across Agricultural Sectors (FAO,2020), and Science and Innovation (FAO,2022a).

Process for the development of the VCoC

In December 2022, at its 171st Session, the FAO Council (FAO, 2022c) endorsed the recommendations of the 28th Session of the Committee on Agriculture (COAG 28) (FAO, 2023a) and:

- i. *encouraged* FAO to undertake further scientific and evidence-based assessments related to the distribution, benefits, trade-offs, and risks of plastics for agricultural use and their alternatives, to address knowledge gaps on plastics in agriculture and *requested* the development of policy instruments, taking into account Members' past and ongoing efforts as well as developing countries' needs and challenges;
- ii. *underscored* the need for improved intersectoral collaboration and governance to address plastic use throughout agrifood systems, and *recommended* FAO to continue to address knowledge gaps, including through inclusive participation of Members and consultations with relevant stakeholders, and subject to the evidence-based assessment referred to in subparagraph i) to develop, within FAO's mandate, a Voluntary Code of Conduct on the sustainable use of plastics in agriculture; and
- iii. *encouraged* FAO to support deliberations of the intergovernmental negotiating committee (INC) on plastic pollution to develop an international legally binding instrument on plastic pollution established by the United Nations Environment Assembly Resolution 'End plastic pollution: Towards an international legally binding instrument (UNEP/EA.5/Res.14)' with guidance on the issues of plastics used in agriculture.

Subsequently, at its 43rd Session in July 2023, the FAO Conference endorsed the Report of COAG 28 (FAO, 2023b).

To implement the COAG 28 recommendation to develop, within FAO's mandate, a VCoC, FAO carried out inclusive and geographically representative consultations with a wide range of stakeholders,¹ and received from the COAG 29 Bureau. The consultation process included:

- i. An Informal Briefing for FAO Members on 25 May 2023 where FAO provided an update on FAO's work on the sustainable use and management of plastics in agriculture and an outlook towards the VCoC development process.
- ii. A Global Expert Meeting held on 27 and 28 June 2023 that brought together technical experts on plastics used in agriculture and their alternatives from different sectors including academia, the private sector, international organizations, and non-governmental organizations (NGOs). The experts provided feedback on the outline and the technical content of the VCoC.
- iii. Regional MultiStakeholder Consultations in all regions (Africa [4 October 2023]; Asia and the Pacific [21 September 2023]; Europe and Central Asia [27 October 2023]; Latin America and the Caribbean [October 2 and October 11, 2023]; Near East and North Africa [October 30, 2023]; and North America [7 September 2023]). Regional and national stakeholders provided feedback on the objectives, scope, technical elements, and regional needs towards the development of the VCoC.

¹ The following groups of stakeholders participated in VCoC consultations: governments; scientific community for plastic pollution in agriculture; scientific community for plastics alternatives in agrifood systems; non-governmental organizations (NGOs) and civil society organizations; UN system bodies, other international organizations, International Financial Institutions (IFIs), and the private sector.

- iv. A public online consultation conducted through the Global Forum on Food Security and Nutrition (FSN Forum) from September to November 2023. 93 respondents from 48 countries provided contributions.²
- v. A Briefing for FAO Members, followed by two consultations facilitated by the COAG 29 Chairperson and where FAO presented the draft VCoC and subsequent revisions, and collected guidance and inputs and feedback.

Structure of the VCoC

Article 1 presents the guiding principles; Article 2 the objectives and scope of the VCoC. This is followed by an explanation of the terms used (Article 3). In Article 4, actions are outlined to improve the enabling environment for sustainable use and management of plastics in agriculture, addressing the systemic causes of the associated plastic pollution. Article 5 suggests actions to be taken directly by stakeholders in the agrifood systems at various stages in the life cycle of plastics used in agriculture. Article 6 presents guidance for monitoring and evaluation of the implementation and updating of the VCoC.

² Respondents who provided contributions to the public online consultation are from Australia, Bangladesh, Belgium, Brazil, Canada, China, Colombia, Côte d'Ivoire, Denmark, Ecuador, Ethiopia, France, Gabon, the Gambia, Germany, Ghana, Greece, India, Indonesia, the Islamic Republic of Iran, Ireland, Italy, Kenya, Lebanon, Lesotho, Liberia, Mexico, Nepal, Netherlands (the Kingdom of), Nigeria, Norway, Pakistan, Poland, Portugal, the Republic of Korea, Romania, South Sudan, Spain, Switzerland, Tajikistan, Thailand, Togo, Türkiye, Uganda, the United Kingdom of Great Britain and Northern Ireland, the United States of America, Viet Nam, and Zambia.

Article 1. Guiding principles

- 1.1.** Actions for the implementation of the VCoC should contribute to the 2030 Agenda for Sustainable Development and to the achievement of the Sustainable Development Goals (SDGs). They should be aligned to the principles of the Rio Declaration on Environment and Development (UNGA, 1992), and the commonly recognized principles of international environmental law. They should take into consideration the internationally agreed frameworks on plastics, chemicals and waste management and contribute to the objectives of the FAO Strategic Framework 2022-31.

Article 2. Objectives and scope

- 2.1.** The objectives of the VCoC are to:
- i.** provide science-based guiding principles for the sustainable use and management of plastics in agriculture aligned with international guidance on chemicals, pollution, and waste across all dimensions of agriculture;
 - ii.** protect human and animal health, food safety, food security, soil, water, and the environment from pollution resulting from the use of plastics in agriculture;
 - iii.** offer a framework to assist governments and other stakeholders in the development of global, regional, national, and sub-national strategies, policies, regulatory frameworks, and programmes to prevent plastic pollution resulting from the use of plastics in agriculture;
 - iv.** foster cooperation and collaboration among relevant stakeholders in the agrifood systems to promote the sustainable use and management of plastic products in agriculture and their alternatives;
 - v.** promote and disseminate knowledge, and stimulate research and development aimed at preventing plastic pollution in agriculture.
- 2.2.** The VCoC is voluntary. It is intended to be implemented within the framework of regional and national priorities and circumstances.
- 2.3.** The interpretation and application of the VCoC should align with and complement legal obligations under national and international legal instruments, while also considering voluntary commitments within relevant international and regional instruments. Nothing in the VCoC should be construed as restricting or undermining any legal obligations that countries may have under international agreements, nor as affecting the right of countries to adopt, maintain or expand more stringent requirements for the sustainable use and management of plastics in agriculture than those provided for the VCoC.
- 2.4.** The VCoC provides recommendations for governments, manufacturers of plastics used in agriculture, and other stakeholders in the agrifood systems to promote sustainable management practices for plastics used in agriculture. It is not intended as a detailed manual providing technical prescriptions for addressing the sustainable use and management of plastics in agriculture and their alternatives, but to offer a generic framework that can be complemented by context-specific technical guidelines, to facilitate practical implementation.
- 2.5.** The VCoC is global in scope. It may be used at regional, national, and subnational levels.
- 2.6.** The VCoC applies to plastics used in primary agriculture production (hereby referred to as “plastics used in agriculture”). It covers all agriculture sub-sectors, including crops and livestock production, aquaculture, fisheries, and forestry. It also covers all stages of the life cycle of plastics used in agriculture, comprising the design, authorization, manufacturing, distribution, sale, use, and end-of life management, including recycling and disposal. Material extraction and processing and retail packaging are not included.

Article 3. Key terms

For the purpose of this Code of Conduct, the following terms will have the following meaning:

Agriculture

The term and its derivatives include crop and livestock production, forestry, fisheries, and aquaculture.

Agrifood systems

Systems that encompass the primary production of food and non-food agricultural products, as well as storage, aggregation, post-harvest handling, transportation, processing, distribution, marketing, disposal, and consumption. (FAO Term Portal, 2024).

Bio-based plastics

Plastics derived fully or partially from biological materials, such as cellulose, potato or corn starch, sugar cane, maize, and soy, instead of fossil-based. They can be engineered to be biodegradable or compostable, or they can be designed to be structurally identical to petroleum-based plastics, in which case they can last in the environment for the same period of time (UNEP, 2023).

Biodegradable material

A material that can, with the help of microorganisms, break down into natural components (e.g., water, carbon dioxide or biomass) under certain conditions (UNEP, 2023).

Biosolids

Nutrient-rich organic materials resulting from the treatment of sewage sludge, which has undergone a process to reduce its water content (FAO Term Portal, 2024).

Development partners

Refers to donors, UN and other intergovernmental or regional entities, global and regional financial institutions and other entities committed to support sustainable development.

Extended producer responsibility (EPR)

Refers to a framework whereby manufacturers of plastics used in agriculture and other stakeholders in the agrifood systems take responsibility for the sustainable use and management of the plastic products they place on the market, including their collection; pre-treatment, e.g. sorting, dismantling or depollution; (preparation for) reuse; recovery (including recycling and energy recovery) and/or final disposal.

Fossil-based plastics

Plastics that are derived from non-renewable fossil-based resources, such as petroleum, coal, or gas. Some fossil-based plastics are biodegradable (FAO, 2021a).

Life cycle

Consecutive and interlinked stages of a product system, from raw material acquisition or generation from natural resources to final disposal (FAO Term Portal, 2024).

Microplastics

Refers to plastic particles less than 5 millimetres in diameter (FAO, 2021a).

Open burning

Uncontrolled combustion of waste without emissions control.

Oxo-degradable products

Products containing a pro-oxidant that induces breakdown of the plastic product into smaller pieces, such as microplastics under favorable conditions (e.g. heat, UV-light and mechanical stress) (UNEP, 2023).

Plastics used in agriculture

Refers to all plastics used in agriculture primary production. "Plastic products used in agriculture" has the same meaning.

Recycling

Processing of waste materials for the original purpose or for other purposes, excluding energy recovery (UNEP, 2024).

Sustainable use and management of plastics in agriculture

Refers to the use and management of plastics in agriculture in a manner and at a rate that does not negatively impact the environmental, social, and economic dimensions of sustainable development, thereby maintaining the potential to meet the needs and aspirations of present and future generations (adapted from UNEP, 2007).

Waste

Substances or objects which are disposed of or are intended to be disposed of or are required to be disposed of by the provisions of national law (UNEP and Secretariat of the Basel Convention, 2019).

Article 4. Enabling environment for the sustainable use and management of plastics in agriculture

4.1. Enabling environment for the sustainable use and management of plastics in agriculture

4.1.1 Governments, manufacturers of plastics used in agriculture, and other stakeholders in the agrifood systems are encouraged to create an enabling environment for the sustainable use and management of plastics in agriculture, including by:

- i.** building evidence to guide decision making;
- ii.** developing and implementing enabling policies and regulatory frameworks to facilitate coordination, enable investments, and support and incentivize the improvement and adoption of best available techniques and practices for the sustainable use and management of plastics in agriculture;
- iii.** facilitating multistakeholder collaboration involving agrifood systems stakeholders, including specifically agrifood producers, at the global, regional, national, and sub-national levels;
- iv.** supporting research and development (R&D) activities to identify alternative technologies and practices that contribute to the reduction of plastic pollution in agriculture, and facilitate the sustainable use and management of plastics in agriculture; and
- v.** supporting capacity development, awareness-raising, and sharing of knowledge and information.

4.2. Building an evidence base to guide decision-making

4.2.1 Governments, manufacturers of plastics products used in agriculture, and other stakeholders in the agrifood systems are encouraged to develop strategies to assess, measure and monitor the use of plastics used in agriculture and their alternatives.

To this end they:

- i.** may conduct surveys and assessments of the types and volumes of plastics used in agriculture and their alternatives; policy and regulatory frameworks; existing capacities; underlying social, economic, and environmental drivers and impacts; and expected trajectory of plastics used in agriculture;
- ii.** should cooperate to develop common approaches for data collection, compilation, management, and reporting, including reporting of relevant SDG indicators where feasible.

4.2.2. Country-specific objectives for data collection may target the amount and type of:

- i.** plastics used in agriculture imported and/or manufactured domestically;
- ii.** plastics used in agriculture placed on the market;

- iii. plastics used in various agricultural applications, including “on-farm” packaging;
- iv. plastic waste generated in agriculture (including soil and organic contamination);
- v. plastic waste generated in agriculture collected;
- vi. plastic waste generated in agriculture recycled;
- vii. plastic waste generated in agriculture subject to open dumping or open burning;
- viii. plastic waste generated in agriculture sent for final disposal, including to incineration facilities for energy recovery.

4.2.3. Information collected on plastics used in agriculture may include material (e.g. polymer) and chemical composition, including the use of recycled content, and should, as much as possible, be disaggregated by market segments and intended use.

4.2.4. In collecting and analyzing data on plastics used in agriculture and their alternatives, governments, manufacturers of plastics used in agriculture and other stakeholders in the agrifood systems should:

- i. endeavour to ensure the availability of technical capacity to collect and analyse the data collected;
- ii. identify practices resulting in plastic pollution in agriculture, including inappropriate repurposing;
- iii. ensure that data collection and management comply with the applicable legislation on data protection;
- iv. engage with all stakeholders in a participatory manner and ensure transparency.

4.2.5. Development partners should incorporate indicators relevant to plastics used in agriculture and their alternatives within their agriculture and environment-related programmes and initiatives. Development partners are encouraged to engage in collaborative efforts to establish harmonized monitoring systems for all projects and programmes related to the use of plastics in agriculture and their alternatives.

4.3. National policies and regulatory frameworks on plastics used in agriculture

4.3.1. Governments, manufacturers of plastics used in agriculture, and other stakeholders in the agrifood systems, are encouraged to take into consideration the VCoC when drafting and implementing their policies, regulatory frameworks, strategies, and action plans related to the sustainable use and management of plastics in agriculture and their alternatives.

4.3.2. Governments, manufacturers of plastics used in agriculture, and other stakeholders in the agrifood systems, should develop policies, regulatory frameworks, strategies and/or action plans, to promote sustainable use and management of plastics in agriculture and their alternatives, including by:

- i. affirming a commitment to combat unsustainable practices on the use and management of plastics in agriculture;
- ii. addressing the root causes of the unsustainable use and management of plastics in agriculture;
- iii. introducing sustainability considerations in the public procurement of plastics used in agriculture;

- iv. introducing monitoring mechanisms to track progress;
- v. allocating appropriate resources, including human, technical and financial resources, to the sustainable use and management of plastics in agriculture.

4.3.3. Policies, regulatory frameworks, strategies and action plans may be implemented through a variety of interventions adapted to the national priorities and circumstances, based on a comprehensive approach that addresses the full life cycle of plastics used in agriculture, including upstream interventions focusing on prevention and sustainable product design, interventions focusing on correct use and retrieval, and downstream interventions to improve the environmentally sound management of plastic waste generated in agriculture.

4.3.4. Upstream interventions may focus on:

- i. overseeing production and demand of plastics used in agriculture and promoting sustainable and environmentally friendly alternatives;
- ii. promoting outcome-based, environmentally sustainable product design aimed at making the production process of plastic products used in agriculture more circular by promoting the use of recycled content, material and energy efficiency, minimization of release of microplastics, minimizing unnecessary use of hazardous materials and chemicals, design for longevity (including reusability and repairability), and recyclability.

4.3.5. Interventions may focus on the correct use and retrieval of plastic products in agriculture to facilitate environmentally sound management and eliminate leakage to the environment, including by promoting adequate installation and application; preventing the use of plastic products in agriculture beyond their safe and effective service life; and promoting the use of appropriate machinery for retrieval.

4.3.6. Downstream interventions may focus on reducing plastic leakage into the environment and improving environmentally sound management of plastic waste generated in agriculture, including by strengthening services and infrastructure to address land-based sources of plastic leakage and the implementation of measures to tackle sea-based sources of marine litter and microplastics.

4.3.7. Development partners should support countries - especially developing countries, economies in transition, and Small Island Developing States - in crafting and executing national policies, regulatory frameworks, strategies and action plans for the sustainable use and management of plastics in agriculture, including by supporting resource mobilization, providing technical assistance, and promoting technology transfer on voluntary and mutually agreed terms, institutional capacity development, and knowledge sharing, as well as facilitating investments for the safe disposal of hazardous plastic waste generated in agriculture.

4.4. Financial and trade instruments

4.4.1. Governments and financial institutions, in collaboration with manufacturers of plastics used in agriculture and other stakeholders in the agrifood systems, are encouraged to:

- i. facilitate access to financial services to meet the financial operational needs of agrifood producers to achieve sustainable use and management of plastics in agriculture and their activities, with special attention to family farmers, women, youth, Indigenous Peoples, small producers and producer associations, micro, small and medium enterprises, and other small-scale actors and vulnerable groups;

- ii. introduce mechanisms to promote the use of less pollutant plastics in agriculture or sustainable and environmentally friendly alternatives, including fees and deposit-return schemes, and waste recovery mechanisms;
- iii. support the development of more sustainable plastic products and practices in agriculture by considering and evaluating the effectiveness of policies and legislation regulating the import and/or manufacturing of targeted plastic products in addressing their potential impacts on environmental, economic, and social systems and human health, and considering possible unintended consequences and trade-offs, in accordance with relevant national legislation, the principles of the multilateral trading system and the World Trade Organization agreements.

4.5. Facilitating collaboration and strengthening multistakeholder platforms among agrifood systems stakeholders

4.5.1. Governments, manufacturers of plastics used in agriculture, and other stakeholders in the agrifood systems, including development partners, are encouraged to:

- i. facilitate the establishment of and support multistakeholder platforms and partnerships among stakeholders in agrifood systems, including specifically agrifood producers, with a special emphasis on the inclusion of smallholder farmers, women, youth, Indigenous Peoples, persons with disabilities, groups in vulnerable situations in rural areas, as well as all relevant stakeholders in the agrifood systems, including waste pickers;
- ii. promote multistakeholder platforms and partnerships at global and regional levels, including through South-South and Triangular Cooperation and collaboration among developed and developing countries;
- iii. implement awareness raising, capacity development and training programmes to promote the sustainable use and management of plastics in agriculture, targeting all agrifood systems stakeholders;
- iv. promote and facilitate international cooperation with a view to promoting innovative solutions towards the sustainable use and management of plastics in agriculture.

4.6. Supporting research and development activities to identify alternative technologies and practices

4.6.1. Governments, manufacturers of plastics used in agriculture, other stakeholders in the agrifood systems, along with development partners, academic and research institutions and civil society organizations, should allocate resources to research and development (R&D) activities and champion innovations aimed at the development and use of less pollutant or alternatives to plastics used in agriculture, sustainable use and management of plastics in agriculture, and reducing associated plastic pollution. They should consider, among others, the following issues:

- i. understanding the scale and fate of both fossil-based and bio-based plastics used in agriculture, including their quantities, composition, use locations, and environmental fate across the supply chain, along with assessing the economic costs associated with plastic pollution in agriculture;
- ii. conducting comprehensive, full life cycle assessments of both fossil-based and bio-based plastic products used in agriculture (both biodegradable and non-biodegradable), as well as alternative products and practices, including traditional practices and natural products used by smallholder farmers, women, youth, and Indigenous Peoples, to discern and compare their specific application risks and benefits within agrifood systems;

- iii. developing robust risk assessment tools that provide a foundation for implementing policies and legislation to prevent and address plastic pollution in agriculture;
- iv. examining the pathways and impacts of plastics used in agriculture, including microplastics, on agroecosystems, food safety, and human health;
- v. analysing the behaviour and degradation rates of biodegradable plastics under practical and local conditions, for different agricultural production activities, in different environmental conditions, such as varying temperatures and humidity levels. The assessments should encompass aquatic environments, soils in diverse climatic zones, products not directly in contact with soils, and potential synergistic effects with other chemicals. Research on biodegradation should include transfer to other environments, biodegradation timeframes and long-term effects;
- vi. investigating the impacts of plastic pollution resulting from the use of plastics in agriculture on microbiomes, soil and water quality, and soil long-term productivity;
- vii. comparing the economic feasibility of alternative non-plastic biobased materials to assist agrifood producers in making the most effective and sustainable choices;
- viii. assess the cost of transition from plastics used in agriculture to alternatives.

4.6.2. Governments, manufacturers of plastic products used in agriculture and other stakeholders in the agrifood systems, including development partners, are encouraged to promote dialogue and cross-sectoral exchange involving R&D agencies, extension and advisory service providers, academia, the private sector, agrifood producers and their associations and consumers to ensure that investments in R&D and innovations respond to their needs and demands and are relevant to the local contexts.

To this end, they may:

- i. offer research grants for developing innovative practices and technologies, including sustainable and environmentally friendly alternatives to plastics used in agriculture, supporting sustainable use and management of plastics in agriculture and reducing associated pollution;
- ii. support knowledge exchange and training to facilitate the adoption and transfer of such technologies and practices on voluntary and mutually agreed terms;
- iii. set up specific public-private partnerships, where appropriate, to facilitate the development, commercialization, adaptation, transfer on voluntary and mutually agreed terms, and adoption of such technologies and practices;
- iv. create platforms to bring together relevant stakeholders who can jointly identify issues to be covered by R&D, as well as potential solutions and innovations.

4.6.3. Waste management companies are encouraged to advocate for and invest in R&D initiatives focused on advancing technologies for the efficient and sustainable retrieval of plastic waste generated in agriculture, including in aquatic environments, and the subsequent collection, sorting and processing, recycling, or disposal, recognizing the wide range of approaches, sustainable alternatives, and technologies available to address the full life cycle of plastics used in agriculture.

4.6.4. Recyclers are encouraged to allocate financial resources to R&D, focusing on innovative approaches to efficiently recycle plastic products used in agriculture by advancing new technologies, materials, and processes that can enhance recycling capabilities for diverse types of plastic products used in agriculture.

4.7. Capacity development, awareness-raising, and sharing of knowledge and information

- 4.7.1.** Governments, manufacturers of plastics used in agriculture and other stakeholders in the agrifood systems, should support science-based education and training of agrifood producers on the sustainable use and management of plastics in agriculture and the reduction and elimination of associated plastic pollution. Such training and education should be context-specific, inclusive and, when applicable, built on local and traditional knowledge and practices, and should address topics such as:
- i.** impacts of plastic pollution resulting from the use of plastics in agriculture on ecosystems and human health;
 - ii.** implications of plastic pollution resulting from the use of plastics in agriculture for food security, food safety and nutrition;
 - iii.** possible alternative products and practices towards the reduction of plastics used in agriculture;
 - iv.** correct use and disposal of plastic products used in agriculture.
- 4.7.2.** Extension and advisory services should raise awareness, share knowledge, foster the adoption and scaling up of technologies and successful practices on sustainable use and management of plastics in agriculture.
- 4.7.3.** Governments, manufacturers of plastics used in agriculture and other stakeholders in the agrifood systems, in close collaboration with civil society organizations, local communities and Indigenous Peoples, should raise the awareness of the public, policymakers and legislators on the sustainable use and management of plastics in agriculture. These efforts should be tailored to the needs of the different segments of the population and include awareness-raising, evidence-based education campaigns, and formal and informal education channels.
- 4.7.4.** Governments, manufacturers of plastics products used in agriculture, and other stakeholders in the agrifood systems, should specify arrangements for technical assistance to agrifood producers and technology transfer on voluntary and mutually agreed terms.

Article 5. Actions to prevent plastic pollution in agriculture and improve the life cycle management of plastics in agriculture

5.1. Design and manufacture of plastics used in agriculture

- 5.1.1.** Governments, manufacturers of plastics used in agriculture, and other stakeholders in the agrifood systems, are encouraged to harmonize the rules and technical specifications applicable to plastic products used in agriculture incorporating sustainable design principles. Rules and technical specifications for plastic products used in agriculture should take into consideration their value for agriculture, adverse effects on health and the environment, easiness for removal, collection and recycling, potential trade-offs, and available international guidance in relation to plastics and chemicals beyond the agriculture sector.
- 5.1.2.** Governments, manufacturers of plastic products used in agriculture and other stakeholders in the agrifood systems should aim to progressively substitute plastics used in agriculture with less pollutant alternatives, including, where feasible, by discouraging the use in agriculture of:
- i.** oxo-degradable plastics;
 - ii.** polymer-coated fertilizers and seeds when commercially available and financially accessible biodegradable alternatives are available;
 - iii.** polyvinyl chloride (PVC) in mulching film and other single-use products for agricultural applications;
 - iv.** per- and polyfluoroalkyl substances (PFAS)-containing coatings.
- 5.1.3.** Manufacturers of plastic products used in agriculture are encouraged to review and take into consideration available guidelines and best practices for their sustainable design. In particular, manufacturers of mulching film are recommended to use a minimum thickness and appropriate materials to increase film strength and prevent its tearing during retrieval operations.

5.2. Plastics products used in agriculture and their alternatives

- 5.2.1.** Governments, manufacturers of plastic products used in agriculture, and other stakeholders in the agrifood systems should adopt measures to enhance the sustainability of plastics used in agriculture and support their sustainable use and maintenance and identify and promote environmentally friendly and sustainable alternative practices and products that contribute to the reduction of demand and use of targeted agricultural plastic products.
- 5.2.2.** Such practices and products should be assessed based on their availability, accessibility, and affordability, particularly in developing countries, feasibility, and agricultural economic performance. Attention should be paid to their potential impact on human, animal, and soil health, agrifood systems and the environment, considering unintended consequences and trade-offs.

5.2.3. Governments, manufacturers of plastics used in agriculture and other stakeholders in the agrifood systems, are encouraged to work with FAO and other relevant international organizations to develop guidance on the use of biodegradable and compostable plastics used in agriculture.

5.3. Authorization and labelling requirements

5.3.1. Governments, manufacturers of plastics used in agriculture, and other stakeholders in the agrifood systems are encouraged to adopt regulatory instruments and procedures to monitor and control the manufacture, importation and use of plastics employed in agriculture, including authorization, labelling information and recognizable logos, and traceability schemes for plastics used in agriculture or targeted plastics used in agriculture.

5.3.2. The regulatory frameworks, procedures and labelling schemes for plastics used in agriculture will be part of and avoid duplication with existing authorization and labelling schemes for non-agriculture related plastic products, while preserving the specific needs of agriculture.

5.4. Recycling of plastic products used in agriculture

5.4.1. Governments, manufacturers of plastics used in agriculture, and other stakeholders in the agrifood systems, are encouraged to:

- i.** promote mechanisms to enable and foster the recycling of plastic products used in agriculture, including incentives, procedures, and schemes to facilitate the involvement of agrifood producers and producer organizations in the collection and processing of plastic products used in agriculture;
- ii.** establish mechanisms for the safe collection, recycling and disposal of plastic products used in agriculture, including shredding, washing, and pelletizing equipment suitable for various plastic types;
- iii.** promote investments and recycling programmes for plastic waste generated in agriculture. This collaboration should involve the development of customized technical specifications and the approval of financial incentives to encourage private sector investment in recycling efforts, technology transfer on voluntary and mutually agreed terms, capacity-building, and scientific and technical cooperation, stressing that there is no single approach. Inappropriate repurposing of plastic materials used in agriculture should be monitored and discouraged.

5.5. Environmentally sound management of plastic waste generated in agriculture

5.5.1. Governments, manufacturers of plastics used in agriculture, and other stakeholders in the agrifood systems, are encouraged to promote environmentally sound management of agriculture plastic waste, including to:

- i.** ensure the adequate collection, storage, transport, and end-of-life management of plastic waste generated in agriculture;
- ii.** support agrifood producers in overcoming barriers related to the collection and storage of plastic waste generated in agriculture;

- iii. support the development of standardized methods, including remote sensing, for the monitoring and reporting of open dumping and open burning of plastic waste generated in agriculture;
- iv. develop extended producer responsibility schemes for plastic products used in agriculture, aligning with international guidance;
- v. collaborate towards the design and development of farm-level plastic waste management and storage systems. Such systems should allow the safe collection and segregation of plastic waste generated in agriculture;
- vi. foster the participation of the informal waste management sector in the design and implementation of collection and recycling schemes for plastic waste generated in agriculture;
- vii. adopt effective measures, including measures related to design, marking, tracing, reporting and recovery requirements, to prevent, reduce and eliminate plastic-containing abandoned, lost or otherwise discarded fishing gear and to follow internationally agreed rules, standards, and recommended practices and procedures;
- viii. prevent and control the transboundary movement of plastic waste generated in agriculture for the purpose of its safe and environmentally sound management in a manner consistent with national obligations and relevant multilateral agreements, including the *Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal*;
- ix. follow the requirements for management of empty pesticide containers in the *International Code of Conduct on Pesticide Management* and the associated technical guidelines and manuals.

5.5.2. Governments, manufacturers of plastics used in agriculture, and other stakeholders in the agrifood systems:

- i. should prevent, prohibit, and avoid the open dumping and open burning of plastic waste generated in agriculture and implement measures to monitor these practices;
- ii. where applicable, should exercise control over the end-of-life management of biosolids from municipal sewage sludge in agriculture.

5.5.3. Manufacturers of plastic products used in agriculture should:

- i. adhere to extended producer responsibility schemes for plastic products used in agriculture they manufacture;
- ii. provide education and training for the relevant stakeholders in agrifood systems, especially farmers, foresters and fisherfolk.

5.5.4. Distributors and traders of plastic products used in agriculture should:

- i. raise awareness among value chain producers about the environmental impact of plastic waste generated in agriculture and provide guidance on the proper handling, sorting, and collection of plastic materials and waste in agriculture;
- ii. support product buy-back programmes for plastic products used in agriculture.

Article 6. Implementation and monitoring

6.1. Stakeholder engagement

6.1.1. Governments, manufacturers of plastics used in agriculture, and other stakeholders in the agrifood systems, including development partners, are encouraged to promote, support, and use the VCoC in accordance with their needs, mandates, abilities, and relevant contexts. To this end, they are encouraged to:

- i.** implement the VCoC within their jurisdictions;
- ii.** disseminate information about the VCoC to all relevant stakeholders to foster a shared understanding among them regarding their collective responsibilities to realize the objectives outlined in the VCoC;
- iii.** monitor the observance and implementation of the VCoC and report relevant information to FAO on a voluntary basis;
- iv.** facilitate the fair, equitable and inclusive participation, and consideration of the needs of affected populations, with special considerations for smallholder farmers, women, children and youth, Indigenous Peoples, persons with disabilities, groups in vulnerable situations in rural areas, as well as all relevant stakeholders in the agrifood systems, including waste pickers, in the implementation of the VCoC.

6.1.2. Development partners, including FAO, are encouraged to support voluntary efforts by governments to implement the VCoC. Support of this nature may encompass technical collaboration, financial aid, strengthening of institutional capacity, sharing, and exchanging data and knowledge, and technology transfer on voluntary and mutually agreed terms. Academic, research institutions and development partners should promote integration of recommendations in the VCoC into their activities and facilitate knowledge exchange and skills development.

6.2. Revision and update of the VCoC

6.2.1. The VCoC should be reviewed periodically. Changes to the VCoC will be made by FAO in consultation with Members and with the approval of the appropriate Governing Bodies.

6.2.2. FAO will support the implementation of the VCoC, including through the development of specific technical guidelines and manuals, as required. Governments, manufacturers of plastics used in agriculture, and other stakeholders in the agrifood systems are invited to use the VCoC as a basis to develop further guidelines and guidance documents.

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