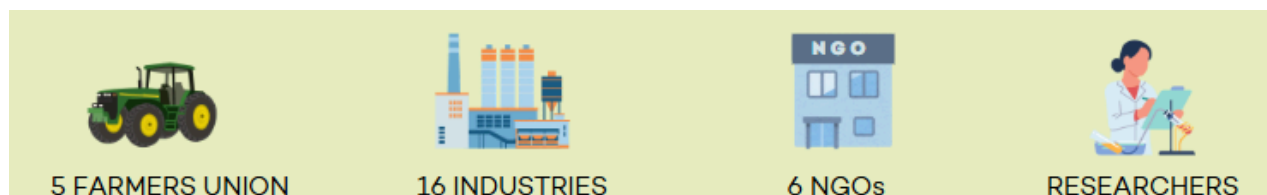


In 2024 a PAPILLONS study was published in the journal **Cambridge Prism: Plastics**. The study, entitled “Addressing the environmental sustainability of plastics used in agriculture: a multi-actor perspective”, aimed at analyzing stakeholder responses and perceptions towards the use of Agricultural Plastic (AP), shedding light on each group’s perceived knowledge gaps and proposed actions. The study collected inputs through surveys and in person meetings from four main stakeholder groups across the world:



1. Farmers’ Perspective

Farmers prioritize productivity, efficiency, and food security, which often make APs an attractive option, as they preserve food quality, facilitate higher yields, and reduce pesticide use. However, there is a growing awareness of the negative environmental impact, particularly on plastic waste accumulation and soil contamination.

Knowledge Gaps

- Lack of reliable research on how micro- and nanoplastics (MNPs) impact soil quality and agricultural productivity in the long term.
- Lack of efficient Agricultural Plastic Waste (APW) collection.
- Impact of the transition to sustainable alternatives on farmers’ financial burden.

Proposed Actions

- Government incentives and cost-sharing to help farmers transition.

- Increase research and information on AP effects on soil and farm productivity.
- More collaboration with policymakers to ensure that regulatory frameworks reflect the realities of the farming sector.

2. Industry & Industry Associations’ Perspective

They emphasize the economic and environmental trade-offs of reducing AP use, as it could contribute to sustainability by reducing water use, pesticide dependency, and crop losses. Most support better end-of-life (EoL) management solutions, rather than banning APs.

Knowledge Gaps

- Are biodegradable/bio-based plastics a viable replacement for conventional plastics?



- Economic challenges of recycling APW.

Proposed Actions

- Expand recycling through Extended Producer Responsibility (EPR) schemes.
- Improve research collaborations between industry, farmers, and policymakers.
- Develop regulatory frameworks accounting for the economic feasibility and environmental sustainability together.

3. Environmental NGO Perspective

NGOs view APs as a major source of pollution. They advocate for reducing APs through policy reforms, economic incentives, and education, arguing that the long-term consequences of plastic pollution outweigh the short-term benefits.

Knowledge Gaps

- More research on the health risks derived from MNPs in food exposure.
- Deepen knowledge on biodegradable plastics under real-world agricultural conditions.
- Regulatory framework should be government-supported and not represent a burden for small farmers.

Proposed Actions

- Stronger regulations on AP use.
- Fund R&D of alternatives and study long-term effects of plastic pollution.

- Support sustainable farming practices, (e.g., organic farming).
- Raising awareness on AP impacts and on alternatives.

4. Environmental Scientist Perspective

Scientists highlight the lack of data on the long-term impact of AP pollution on soils and ecosystems, as research has focused more on marine pollution than on agriculture thus far. They call for evidence-based policies integrating scientific findings.

Knowledge gaps

Scientists call for further research on:

- The amount and degradation of plastics in soil (under different climatic conditions).
- Microplastic effects on biodiversity.
- Viability of biodegradable plastics.
- Long-term effects on human health.

Proposed actions

- Global research initiatives to map the extent of AP pollution.
- Standardized methods for assessing MNP accumulation and its effects on soil and crop productivity.
- Close collaboration with policymakers to translate scientific findings into effective regulations.
- Close collaboration with industries, to promote R&D on sustainable alternatives to plastics.



Reference: Tartiu VE, Hurley R, Baann C, et al. Addressing the environmental sustainability of plastics used in agriculture: a multi-actor perspective. *Cambridge Prisms: Plastics*. 2025;3:e5. doi:10.1017/plc.2024.34



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