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For scientists, scientists, students, graduate students, representatives of business and public organizations and higher education institutions and a wide range of readers.

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TOWARDS PROACTIVE POLICY: A FRAMEWORK FOR SAFE AND SUSTAINABLE FERTILISER MANAGEMENT

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The anticipated growth of the population in forthcoming decades is poised to exert a heightened strain on agricultural production, potentially exacerbating its dependence on fertiliser application. Within this milieu, pollution-related concerns stemming from imprudent fertilisation practices are progressively intensifying. Globally, numerous initiatives have been initiated to coordinate countries' endeavours in addressing these concerns. Concurrently, national frameworks for sustainable fertiliser management exhibit systematic organisation and efficacy deficiencies. Consequently, the health aspect of food security remains a pertinent pragmatic and scientific apprehension.

This study seeks to elaborate on the conceptual framework of proactive policies regarding safe and sustainable fertilisation, which aligns with extant global initiatives. The following research questions guide this study: What constitutes the global perspective on sustainable fertilisation? What are the main priorities at the national level? What measures could be undertaken to induce transformative change?

Since 2016, a plethora of global initiatives has emerged to spotlight concerns surrounding soil health, nutrients, and fertilisers [3]. After protracted multilateral deliberations, the Code of Conduct for Sustainable Use and Management of Fertilizers was established, containing voluntary standards for industry players and stakeholders [4]. Additionally, the approval of the Colombo Declaration under the auspices of the United Nations in 2019 marked a significant milestone, leading to the development of a Roadmap for Action on Sustainable Nitrogen Management 2020-2022. This roadmap fosters global cooperation and coordination towards improved and sustainable nitrogen management [1], sparking a global discourse and collective efforts to combat soil pollution from fertilisation.

Nevertheless, translating these global solutions into effective measures and promoting sustainable fertilisation at the national level remains a formidable challenge. Scholars have highlighted the dearth of locally tailored solutions and the inconsistency and inefficiency of national policies, even within developed nations. Raising awareness and transferring knowledge are identified as pressing and incomplete issues, particularly in countries reliant on agriculture [5].

The Ukrainian context serves as an apt illustration of these challenges. While the draft Food Security Strategy addresses fertilisation concerns within the framework of agroecological risks for food security [2], the previous Agriculture Development Strategy failed to consider health implications [8]. Although the Law of Ukraine, "On Pesticides and Agrochemicals", prioritises health preservation and

environmental protection over economic benefits [7], it neglects the need to analyse and assess pesticide and agrochemical use effects.

The national sustainable fertiliser management system could be envisaged as a formation comprising governmental bodies, industry stakeholders (including research and development, production, testing, and distribution of fertilisers), and end-users. Concurrently, components such as problem awareness, knowledge generation, and transfer directly affect fertiliser practices (Fig. 1).

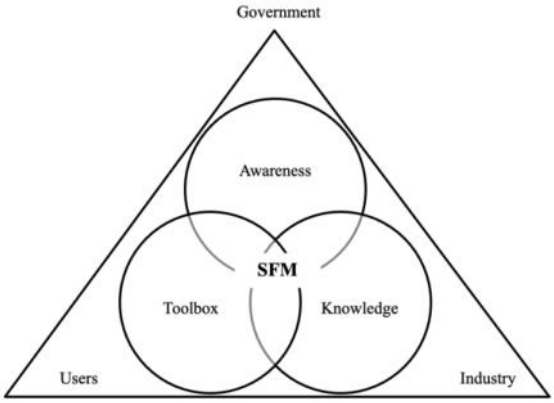

Figure 1. National sustainable fertiliser management (SFM) system view: actors & component dimension [6]

The government plays a pivotal role in the national sustainable fertiliser management system, serving as a mediator between the economic interests of producers and societal concerns, while also facilitating feedback mechanisms. Central to this process is fostering awareness of the issues surrounding fertilisation.

Producers often prioritise short-term economic gains through fertilisation, overlooking potential long-term social and environmental repercussions due to the absence of immediate negative consequences. It is imperative for the government to elucidate the long-term effects of fertiliser practices to stakeholders in a manner that is comprehensible and pertinent in the short term. This necessitates a comprehensive evaluation and demonstration of fertilisation's adverse social and environmental impacts.

A well-functioning national sustainable fertiliser management system entails collaboration among key actors and stakeholders (government, industry, and users) to continuously improve fertilisation practices through awareness-raising, knowledge generation, transfer, and selecting and implementing appropriate tools. The guiding principles of the system’s functioning include professionalism, transparency, innovation, knowledge transfer, information support, trust, and long-term sustainability [6]. This collaborative approach enables

the setting of strategic targets that encompass not only production and economic objectives but also environmental and social considerations, thereby facilitating monitoring, control, and evaluation processes, alongside the implementation of economic incentives for sustainable fertiliser practices.

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