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INTERRELATED THREATS: PLASTIC AND CHEMICAL POLLUTION IN THE OCEANS AND THEIR IMPACT ON AQUATIC FOOD SECURITY

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Abstract

Purpose: This study examines the intertwined threats of plastic and chemical pollution in marine ecosystems and their implications for aquatic food security. Both forms of pollution have become increasingly urgent global concerns, as they threaten biodiversity, ecosystem services, and the safety of seafood consumed by millions of people worldwide. **Design/Methodology/Approach:** A qualitative, descriptive exploratory research design was applied, combining systematic literature review and semi-structured expert interviews. Data were collected from peer-reviewed journal articles indexed in Scopus, technical reports from international organizations (e.g., FAO, UNEP), and policy documents. Thematic analysis was employed to identify patterns, relationships, and emerging issues concerning plastic chemical interactions and their impact on food safety and security. **Findings:** The findings highlight that plastic pollution, particularly microplastics and nanoplastics, causes direct physiological stress to marine organisms and serves as a vector for hazardous chemicals such as persistent organic pollutants (POPs) and heavy metals. Chemical pollutants, especially mercury and pesticides, exhibit bioaccumulative and biomagnifying effects along aquatic food webs. The combined exposure amplifies risks, undermines ecosystem stability, and poses potential health hazards for human consumers. This dual threat jeopardizes both marine biodiversity and global food security. **Practical Implications:** The study emphasizes the urgency of integrated policy responses, including stricter waste management, reduced use of single-use plastics, and stronger regulations on toxic chemicals. It also suggests the need for cross-disciplinary research focusing on realistic co-exposure scenarios, sensitive detection methods for nano microplastics, and risk assessments for seafood safety in diverse socio-ecological contexts. **Originality/Value:** By addressing the synergistic effects of plastic and chemical pollution, this study contributes to filling a critical gap in the discourse on marine environmental risks. It underscores the multidimensional nature of ocean pollution, ecological, socio-economic, and health-related, while providing insights for policymakers, researchers, and practitioners seeking sustainable solutions to safeguard marine ecosystems and aquatic food security.