

A Retrospective Review of Global Commercial Seaweed Production—Current Challenges, Biosecurity and Mitigation Measures and Prospects

ABSTRACT

Commercial seaweed cultivation has undergone drastic changes to keep up with the increasing demand in terms of the quantity and quality of the algal biomass needed to meet the requirements of constant innovation in industrial applications. Diseases caused by both biotic and abiotic factors have been identified as contributing to the economic loss of precious biomass. Biosecurity risk will eventually affect seaweed production as a whole and could cripple the seaweed industry. The current review sheds light on the biosecurity measures that address issues in the seaweed industry pushing towards increasing the quantity and quality of algal biomass, research on algal diseases, and tackling existing challenges as well as discussions on future directions of seaweed research. The review is presented to provide a clear understanding of the latest biosecurity developments from several segments in the seaweed research, especially from upstream cultivation encompassing the farming stages from seeding, harvesting, drying, and packing, which may lead to better management of this precious natural resource, conserving ecological balance while thriving on the economic momentum that seaweed can potentially provide in the future. Recommended breeding strategies and seedling stock selection are discussed that aim to address the importance of sustainable seaweed farming and facilitate informed decision-making. Sustainable seaweed cultivation also holds the key to reducing our carbon footprint, thereby fighting the existential crisis of climate change plaguing our generation.