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Blue Economy Roots: The Rise of Ocean Farming Practices

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Abstract: Ocean Farming, often referred to as marine aquaculture or mariculture, presents a suitable solution to global food security, environmental protection, and the issues arising from overfishing and climate change. This practice involves the cultivation of seaweed, shellfish, and finfish through various methods, including submerged cages, seabed facilities, and vertical underwater farming. Techniques like Integrated Multi–trophic Aquaculture (IMTA) help create balanced ecosystems that enhance biodiversity and support habitat restoration. Seaweed plays a crucial role by absorbing CO₂, lowering ocean acidity, and removing pollutants, while shellfish contribute by filtering water, thus improving marine health. Organizations such as Green Wave are at the forefront of regenerative ocean farming, employing rope scaffolding systems for the cultivation of seaweed and shellfish, which require minimal resources, including no freshwater or fertilizers. These farms not only yield high outputs but also maintain a low carbon footprint and are economically accessible. As the demand for food continues to rise globally, ocean farming serves as a complementary approach to traditional agriculture, providing a resource-efficient and eco-friendly method for producing nutritious food while helping to restore marine ecosystems.

Keywords: Marine Aquaculture, Mariculture, Integrated Multi-Trophic Aquaculture (IMTA), Carbon Sequestration, Polyphenols, Aquaculture, Hydroponic Husbandry, Grouser Culture, Biodegradable Algal Bioplastics, Carrageenan, Chitosan, Bioactive Compounds, Sustainable Development

