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Integration of Seaweed Cultivation, Agricultural and Non-Enterprises: A Comparative Analysis of Livelihood Diversification in Takalar Regency, South Sulawesi

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Seaweed cultivation plays a strategic role in the livelihoods of coastal communities, enhancing food security, generating income, and providing employment. Takalar Regency, in South Sulawesi Province, is a coastal area with high potential for seaweed cultivation. However, price fluctuations, climate change, and low product availability have encouraged farmers to diversify their livelihoods. This study analyzes the patterns of livelihood diversification among 41 seaweed-farming households across six hamlets in Laikang Village, using thematic qualitative case studies. Six diversification patterns were identified: (1) seaweed cultivation; (2) seaweed and agriculture; (3) seaweed and fisheries; (4) seaweed with agriculture and fisheries; (5) seaweed, agriculture, and non-agriculture; (6) seaweed and non-agriculture. Patterns of seaweed cultivation, combined with agriculture and fisheries, primarily rely on natural, human, and financial capital, reflecting a stronger integration of livelihood assets. On the other hand, patterns involving non-agricultural businesses require social, human, and financial capital. Furthermore, most diversification patterns have not been integrated into farmer groups, resulting in limited access to government assistance and training programs. Diversification and investment are key strategies in addressing economic and social vulnerability. The study highlights the importance of strengthening institutional support, capacity building, and market access to promote sustainable seaweed-based livelihoods in coastal communities.

Keywords: Aquaculture, algae, *Gracilaria* sp., livelihood diversification; seaweed cultivation; sustainable livelihoods; rural resilience.

INTRODUCTION

The fisheries and aquaculture sector plays a dual strategic role, supplying raw materials for upstream industries while supporting downstream exports (Alemu et al., 2023). This sector significantly contributes to improving the welfare of coastal communities. One key aquaculture product, seaweed (an algae plant), is cultivated by taking its young spores as seeds (Billing et al., 2021). In Indonesia, seaweed production is projected to reach 10.8 million tons by 2024, dominated by *Gracilaria* sp. and *Kappaphycus alvarezii* (formerly *Eucheuma cottonii*), which serve as raw materials for food, cosmetics, medicine, paper, paint, and fertilizer (Fisheris, 2024). Seaweed is chosen because of its easy cultivation technology, quick return on investment, and ability to operate alongside other businesses. However, cultivation is highly dependent on natural conditions and price fluctuations, and some seaweed farmers have chosen to withdraw due to competition from beach-based tourism operations (Mariño et al., 2019). Laikang Village, Takalar Regency, is the site of seaweed cultivation in South Sulawesi. This village has excellent potential for seaweed cultivation, but prices are highly volatile. In January 2024, IDR 14,000 per kilogram. It then fell again to IDR 11,000 per kilogram in May and June 2024, before rising to IDR 13,000 per kilogram in November and December 2024. While harvesting at 40 days yields higher quality, higher-priced products, farmers often employ rapid-harvesting methods (40 days) to mitigate crop failure

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