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From waste to value through circular economy opportunities in traditional sago processing systems in South Sulawesi, Indonesia

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Main Article Content

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Abstract

Abstract. *Tahnur M, Rampisela DA, Rahmadanih R. 2026. From waste to value through circular economy opportunities in traditional sago processing systems in South Sulawesi, Indonesia. Asian J For 10 (1): r100139. <https://doi.org/10.13057/asianjfor/r100139>.* In the eastern region of Indonesia, sago (*Metroxylon sago*) is a local food that has an important role in supporting food security as well as the livelihood of rural communities. However, traditional sago processing is generally still carried out on a small scale and follows a linear pattern, resulting in large amounts of solid and liquid waste and reflecting inefficient resource utilization. Although the circular economy is increasingly being talked about in the agro-industrial system, empirical evidence for its application to small-scale traditional sago processing is still limited. Using the 9R framework, this study aims to map the stages of traditional sago processing, identify operational obstacles and waste generation points, and trace circular economy pathways that have the potential to be implemented. The research was conducted through an exploratory qualitative case study on a traditional sago processing facility in North Luwu District, South Sulawesi, Indonesia. Data was collected through field observations and semi-structured interviews with key

stakeholders involved in the processing process. The results of the study show that the main sources of waste include leaves and fronds, bark, sago waste, liquid waste, and residual starch sediments. The study also found a number of opportunities for circular utilization, such as natural packaging, bio-briquettes, animal feed, mushroom cultivation media, organic fertilizers, biogas production, and sago larval cultivation, although current reuse practices are still limited and informal. Overall, this study presents empirical evidence on waste streams and circular economy prospects in traditional sago processing systems, while offering practical strategies to improve resource efficiency and environmental sustainability in the context of small-scale agro-industry.