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Small-Scale Post-Harvest Processing of Underutilised Fruits and Vegetables – A Framework for Assessing Economic Viability

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Abstract

Over recent years, a growing body of research has pointed towards the great potential in processing underutilised fruits and vegetables (UFV) into highly nutritious food products, to prevent micronutrient deficiencies among vulnerable populations in sub-Saharan Africa. Approaches which tap into this potential, however, have not been adopted at a significant scale by smallholder farmers and rural entrepreneurs in Western Africa. Consequently, post-harvest losses remain high and traditional processing methods, such as sun drying, which tend to adversely affect the quality and safety of food products, continue to be the most prevalent form of food processing. A key limitation in the dissemination and uptake of modern processing for underutilised species is the lack of information on market barriers, as well as economically viable and context appropriate business models. Based on an extensive literature review, key market and economic barriers for small-scale renewable energy driven processing of UFV in Western Africa have been identified and a preliminary theoretical framework for the assessment of economic viability developed. Results point towards an often insufficient understanding of customer preferences as a major source of overestimation of willingness to pay and demand development for high-nutrient processed foods, as consumption of UFV often varies widely throughout countries and reliable data are rarely available. Short, pronounced harvest seasons for UFV pose key considerations for the economic viability of small-scale processing. Based on the availability of UFV, processors are oftentimes required to produce a large share of their annual production during a short time window following rainy seasons. Apart from cash flow and storage constraints, this can result in a business model which conflicts with the economics of renewable energy driven technologies, whose high investment costs and near zero running costs dictate a maximisation of annual capacity utilisation. In a next step, the developed framework will be verified using data from Nigeria and Sierra Leone, collected through semi-structured interviews with UFV traders and local farmers. Results will be used to inform the development of context appropriate business models within UPGRADE Plus, a BMEL funded research project on decentralised post-harvest processing of UFV to promote food and nutrition security in Western Africa.

Keywords: Business models, decentralised renewable energy technologies, economic viability, market barriers, post-harvest processing, underutilised fruits and vegetables

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