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Fractal approach: A methodology for optimizing food packaging development in local Agri-Food systems**Karan Valente***University of the State of Para, Brazil*

This study investigates the challenges of applying and improving the packaging design process for food in local agri-food systems. The literature review reveals a significant lack of research in this area, highlighting the need for specific methods that focus on contextualized, interdisciplinary, and innovative design approaches. To address this gap, this work develops a methodology that integrates principles of "Packaging Design," "Design Thinking," and "Project Management" to

optimize the development of food packaging in these production systems. Applied, exploratory, and descriptive in nature, the study utilized a mixed-methods approach, conducting longitudinal-crosssectional studies and action research principles, guided by seven leading hypotheses. The results reveal the complexity of this design activity and introduce the "Fractal" method, composed of a framework, a project briefing form, and two multi-criteria checklists covering 15 themes and 137 criteria. The conclusions propose a new, holistic methodology aimed at promoting value creation, differentiation, and sustainability of local agri-food products, encouraging practices that

respect ecological limits and promote social inclusion. Additionally, the proposed approach allows for the evaluation of the environmental, social, and economic effectiveness of packaging, offering significant theoretical and practical contributions for more efficient management and innovations in areas such as design, engineering, food science and technology, and rural development

Biography

Karan Valente holds a Bachelor's degree in Design from the State University of Pará (UEPA, 2010), with specializations in Production Engineering (UEPA, 2011) and Marketing Management (FACI, 2013). He has a Master's degree in Rural Development and Agro-Food Enterprise Management from IFPA (2020) and is currently a PhD candidate in the same program. Since 2008, he has been working in the fields of Entrepreneurship, Innovation, and Marketing, with an emphasis on marketing management and strategy, new business modeling, innovation management, and design thinking. Currently, he is a professor, researcher, and project coordinator at UEPA.