

COMMUNITY ENGAGEMENT ARTICLE

Empowering Women-Led Agro-Processing Microenterprises Through Appropriate Food Packaging Technology and Digital Commerce

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Abstract

Deploying nitrogen-flushing vacuum sealing and QR-code product traceability for 45 rural female entrepreneurs. Product shelf-life extended by 6 months, expanding direct market distribution.

Keywords: Women Empowerment, Food Packaging, Vacuum Sealing, Microenterprises, E-Commerce Onboarding

1. Introduction

Rural women entrepreneurs producing fried banana chips, shredded fish, and herbal syrups in coastal villages face severe barriers in scaling due to poor packaging aesthetics, lipid oxidation rancidity, and lack of digital sales access.

2. Method

An integrated technological assistance program equipped 45 female-led home processing units with automated vacuum nitrogen flush packaging equipment, nutrition fact certification, and digital payment onboarding over a 9-month incubation cycle.

3. Results and Discussion

Product shelf life extended from 3 weeks to 7 months without chemical preservatives. Microenterprises successfully onboarded onto national e-commerce marketplaces, yielding a 112% mean increase in monthly enterprise net revenue.

4. Conclusion

Targeted technological upgrading in primary food packaging, when coupled with digital market access, produces transformative economic autonomy for rural female micro-entrepreneurs.

Declarations

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Conflicts of Interest: The authors declare that they have no competing financial or personal interests.

Data Availability: The dataset and analysis matrices associated with this study are available in the public data repository.

Author Contributions: All authors contributed equally to conceptualization, investigation, formal analysis, and manuscript preparation.

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