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Assessing Public Perception of Insect Bioconversion of Food Waste in Dense Urban Environments

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Abstract : Insect bioconversion of food waste (BFW) in urban environments holds immense potential for circular urban food systems through the recycling of food waste into high-value byproducts with the use of insects. However, the acceptance of these facilities in urban residential settings, particularly for residential food waste recycling, remains underexplored. This study investigates the factors influencing Singaporean residents' acceptance of BFWs, focusing on public housing neighbourhoods. We conducted a city-wide survey (N= 1000) with residents to understand their personal experiences, knowledge, attitudes, disgust sensitivity, environmental identity and perceptions of risks and benefits related to insect bioconversion of food waste (BFW) facilities. Our analysis revealed that acceptance is influenced by factors such as the aesthetic appeal of the facility, insect-related stigma, perceived convenience, financial incentives, and place attachment. Our study also highlights a prevalent 'Not in my backyard' (NIMBY) sentiment, with residents generally open to BFWs but resistant to having them near their homes. The NIMBY sentiments also highlight the significance of perceived distribution fairness and its perceived impact on neighbourhood image and property value. This highlights the complex interplay of factors like proximity to waste drop-off points, time investment in waste segregation, sustainability concerns, prior exposure to composting or urban farming, and the built characteristics of housing neighbourhood in shaping acceptability and NIMBY attitudes. To increase acceptance and reduce NIMBY sentiments, we recommend strategically placing BFWs in community gardens, mitigating odour and pest risks, and offering financial incentives for initial engagement. To facilitate such circular bioeconomy interventions, the study warrants to incorporate acceptance factors into the urban and architectural design of the new neighbourhoods. This research provides a foundational understanding of community perceptions and expectations regarding BFWs in their local environment and is instrumental in developing strategies to enhance acceptance and comprehension for developing circular bioeconomy frameworks in dense cities.

Keywords : urban food systems, circular bioeconomy, sustainability, food waste bioconversion, environmental psychology, alternative proteins
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