

STRATEGIC MODEL FOR NANOSTORES IN THE LAST MILE DISTRIBUTION OF FRESH FOOD

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Fresh food distribution has become increasingly complex as emerging regions and megacities develop, due to factors such as product perishability, transportation challenges, storage requirements, and retailers' geographical distribution. This complexity is particularly challenging in peripheral regions where food security is already compromised. These regions are usually underserved by larger food retailers, leaving room for small local retailers, known as nanostores, to bridge this gap. However, despite their strategic role in those communities, nanostores still face logistical and operational inefficiencies that restrain their ability to supply fresh food affordably and consistently. Nanostores in these areas struggle due to limited access to reliable transportation, storage facilities, and cash flow, which are crucial for commercializing perishable items. This research aims to analyze the current role of nanostores and propose a strategic model to improve the last-mile distribution of fresh food through these channels in such vulnerable regions. The study focuses on a representative location of a typical Latin American municipality, such as the Sabana Centro in Bogotá, Colombia.

The methodology involves both quantitative and qualitative approaches. First, a thorough literature review is conducted to understand how literature has been documenting the role of small retailers such as nanostores in emerging regions. In this direction, the project begins by assessing the current state of fresh food distribution and consumption in these regions. Then, the primary data raised from a structured survey is added to geographical data, to explore and characterize the different settings on the explored region. This step will serve as basis for the development of a mathematical model that optimizes nanostore locations in the studied regions, to maximize the coverage and better serve underserved areas of fresh food. The model will incorporate factors such as store location and costs. Additionally, the case study from Sabana Centro will be used to test the resiliency of nanostores that should serve fresh food to the regions under different disruptive conditions, ensuring its applicability in real-world settings.

One of the key innovations of the proposal is the organization of food retailing through an organized nanostore group, which is expected to reduce costs and improve food accessibility in underserved regions. By enhancing the efficiency of nanostore operations, this study contributes to improving the accessibility to nutritious food to low-income communities, which often suffer

from higher levels of food insecurity. Moreover, the proposed model has the potential to be scaled up or adapted to other regions facing similar challenges.

The expected outcomes of this research include a set of actionable recommendations for policymakers and decision makers, both in the public and in the private sector. By providing a sustainable and efficient model for retailing fresh food through nanostores, the study aims to contribute to the long-term goal of reducing food insecurity in peripheral and vulnerable regions. Furthermore, the research underscores the importance of integrating nanostores into broader food supply chains, thus reinforcing their role as critical actors in ensuring food security.

Palabras clave: Nanostores, Fresh Food, Last-mile.