

A STUDY OF THE SUCCESS CRITERIA AND IMPACT OF THE IMPLEMENTATION OF AUTOMATED REFILL STATIONS IN THE SALE OF FAST-MOVING CONSUMER GOODS (FMCG) IN LOW-INCOME ENVIRONMENTS

Johann F Görgens, Irene N.O. Lamptey, Andrew C.D.P. Steiner, Somayeh Farzad
Stellenbosch University, South Africa

KEY FINDINGS

A study on the success criteria and impact of the implementation of automated refill stations in the sale of fast-moving consumer goods (FMCG) in low-income environments was conducted. The project significantly exceeded its original deployment targets, with 92 placed in trade in South Africa. Sonke expanded operations into Nigeria and Zimbabwe, with 34 machines placed in trade across these markets. Over 610 kL of cooking oil was sold through the refill machines in South Africa during the reporting period. Across 18 months, 374,131 retail sales were recorded, resulting in the diversion of approximately 1,496,524 pieces of plastic from landfill. The model also delivered measurable economic benefits to consumers, with total savings of at least R4,258,102 and an average saving of R11 per transaction. Two critical success factors emerged: the presence of the SunQueen brand on store shelves and strong buy-in from store managers. Stores that stocked SunQueen oil performed significantly better, with 80% showing positive sales trends compared to 59% of stores without the brand.

INTRODUCTION

This project was designed to de-risk circular economy interventions through the deployment of automated cooking oil refill stations. The initiative sought to address two interlinked challenges: plastic packaging waste and affordability of staple goods.

The central premise of the model is that refill infrastructure can reduce single-use plastic entering landfill while offering consumers lower prices through packaging cost savings.

Beyond environmental and affordability objectives, the project placed strong emphasis on generating credible, data-driven insights to guide future scale-up decisions and strategic partnerships.

METHODOLOGY

Implementation performance was monitored through structured data collection and automated reporting. Sales data from each machine were collected and processed using Python scripts, enabling continuous tracking of key indicators such as transaction volumes, litres sold, plastic diverted from landfill, and customer savings. Plastic diversion calculations assumed that each sale avoided four plastic components (bottle,

label, cap and cap lock). Consumer savings were estimated by comparing refill prices with shelf prices for equivalent product sizes.

To understand store-level performance drivers, a market research and catchment analysis was conducted in Gauteng, where detailed socio-economic data were available. A 3 km radius around each store was used to define the catchment area. Socio-economic variables including age distribution, employment status, race, language, literacy, and sex were converted into percentage shares to ensure comparability across locations.

Exploratory analysis included scatter matrices and correlation analysis. Both linear regression and random forest regression models were developed to assess whether socio-economic indicators could predict sales volumes. Model performance was evaluated using mean squared error (MSE). In addition to quantitative analysis, site visits were conducted and discussions were held with the Sonke team and store managers to gather qualitative insights into operational performance and success factors.

MAIN RESULTS

The project achieved substantial scale relative to its original targets. 72 Machines were built and 92 deployed in South Africa. Over 610 kL of cooking oil was sold during the 18-month reporting period, with 374,131 retail transactions recorded. Sales were distributed across product sizes, with 2L units accounting for the largest share, followed by 750ml and 5L purchases.

The environmental impact of the intervention is substantial. Over 1.49 million pieces of plastic were diverted from landfill through retail refill transactions alone. This demonstrates the tangible contribution of refill infrastructure to reducing packaging waste in the fast-moving consumer goods sector.

From an affordability perspective, the refill model delivered meaningful cost savings to consumers. Total savings exceeded R4.25 million over the 18-month period. These savings strengthen the value proposition of refill systems, particularly in price-sensitive communities.

Trend analysis showed that 66% of machines experienced positive sales growth, while 34% showed declining trends, with some machines discontinued after several months. However, the predictive modelling demonstrated that socio-economic indicators were not reliable predictors of performance. All correlations between socio-economic variables and sales were below 0.1, and both linear and random

forest models produced high MSE values. Even when interaction effects were considered, predictive power remained weak.

Instead, qualitative and operational factors proved more influential. Stores that stocked the SunQueen oil brand experienced significantly higher sales performance. Brand recognition appears to enhance customer trust and drive uptake of the refill option. Furthermore, strong commitment from store managers emerged as a decisive success factor. Where managers actively promoted the refill model and aligned with its mission, machines performed more consistently.

Overall, the results demonstrate that automated refill infrastructure can generate measurable environmental and economic benefits while exceeding implementation targets. However, future scale will depend less on neighbourhood demographics and more on brand positioning, operational execution, and strong retail partnerships

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