

**Comparative Analysis of Technology Adoption  
Behaviour between Rural and Urban-based Micro  
and Small Food Manufacturing Enterprises in Kenya**

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# Background & Introduction

- Technology / innovation is a critical factor for Industrial revolution, rejuvenation of organizations in the new markets and economic development (Furtado, 1961; Okpara, 2007; *World Trade Report, 2013*)
- High-tech products are likely to grow quicker at 9% per annum than raw goods growth of 8% at the export market (WTO, 2013)
- In economies where agriculture is the mainstay, heavy investments have been done in value addition to meet the quality and quantity demanded by internal and external markets.
- Kenya's position in the global market is worsened by the competition of substitute food products from European, China and East Asia countries (Annunziata & Martucci, 2008; Kenya National Bureau of Statistics, 2013)

# Agro-food processing in Kenya



# Agro-food contribution to Kenya Economy c. US\$ 69 billion

10%  
GDP



3/10  
Jobs



4.8 BILLION  
IN EXPORT



# Problem

- Kenya lags behind in acquiring, utilising and accumulating right technology for agricultural revolution(Juma, 2011).
- industrialisation disequilibrium in agriculture based manufacturing with geographical dimension.
- lopsidedness in development and burgeoning urban population at the expense of underdeveloped rural regions and growth of slums in cities due to influx of rural populations to towns (Patel & Chavda, 2013)

# Research Objective & Hypothesis

- This study investigates how technology adoption behaviour of entrepreneurs in agro-food processing responds to socio-spatial concepts of urbaneness and ruralness. The current study hypothesises that:
  - $H_0$  There is no difference in technology adoption behaviour between urban and rural agro-food manufacturing micro and small enterprises

# Literature Review

Main constructs	Theories & Models	Proponents	Main teachings
Rural and urban areas	Rural and urban development	Mwangi and Mugenda, 2013; Kalantaridis and Bika, 2006; Heilbrunn, 2010; Korsgaard, Muller, and Tanvig, 2015.	<ul style="list-style-type: none"> <li>•Rural areas are spaces with large open arable land and small population settlements</li> <li>• rural areas are socially and economically marginalised and disenfranchised by the state and market forces</li> <li>•Rural areas lack requisite infrastructure, facilitative environment that would attract technology acquisition and utilisation</li> </ul>
	<i>Triple Helix model</i>	Chaisalee, Kaewattana, Tanticharoen, and Bhumiratana, 2010; Leydersdoff and Basselaar, 1997; Chaisalee, et al.	<ul style="list-style-type: none"> <li>•a collaborative system networking that engaged government, university and industry</li> <li>•Studies have recognized the system as an effective technology development model in a complex and dynamic environment</li> </ul>

# Literature Review

Main constructs	Theories & Models	Proponents	Main teachings
	<i>One Village One Product</i>	Kurokawa, Tembo, & Te Velde, 2011; Natsuda, Wiboonpongse, Ingusa, Shingkhosat and Thoburn, 2011	<ul style="list-style-type: none"><li>•It is about processing, quality control, packaging, designing and market control helped the residents of a village come up with one advantageous staple product that boosted sales revenue and improved livelihoods.</li><li>•OVOP is characterized by engagement of firms that are specialized in small industries, geographical near to each other, having similar socio-cultural identities and trust, strong inter-firm relationships, self-help oriented and with regional government support</li></ul>

# Literature review

Main constructs	Theories & Models	Proponents	Main teachings
	<i>The Saemul Undong(SMU) or New village movement model</i>	Hong, 2013; Douglass, 2013; Reed, 2010.	<ul style="list-style-type: none"> <li>•focussed mental reform of the villagers into self-reliance and own-initiated economic growth</li> <li>•mobilised villagers to take personal initiatives, start projects with little resources at hand before the government came in to boost.</li> <li>•The government promoted competition among the villages and rewarded the best performance</li> <li>•it fostered unity, sense of national identity and autonomous model of development among Koreans</li> </ul>
	Growth Pole theory	Perroux, 1955; Komarovsky and Bondaruk,	<ul style="list-style-type: none"> <li>•The theory was developed to explain how growth manifests itself at a point and percolates to the periphery</li> <li>•It contemplates that growth starts from one point of concentration or</li> </ul>

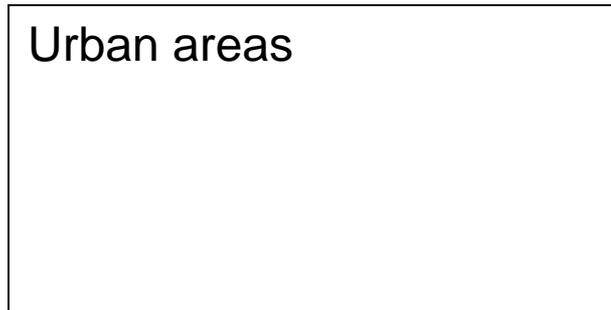
# Conceptual framework –Growth Pole Theory

- to build the framework that would better explain the difference in technology adoption behaviour in urban and rural areas among agro-food processors in Kenya.

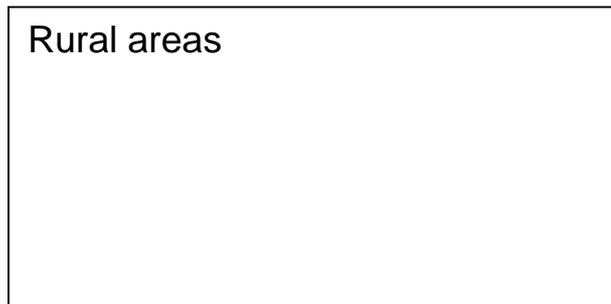
# Conceptual frame work

## Independent Variables(Geospatial areas)

Urban areas

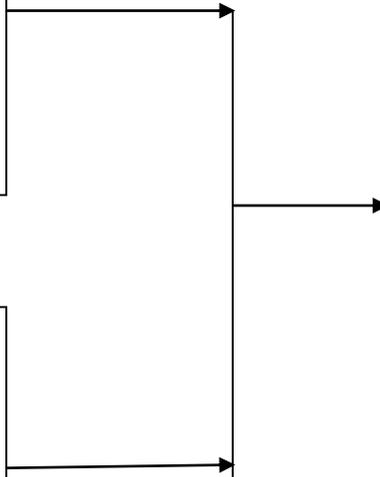
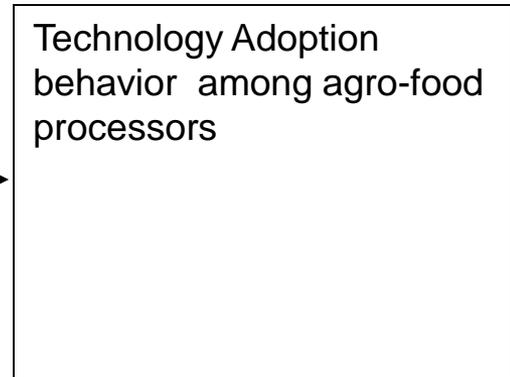


Rural areas



## Dependent Variable

Technology Adoption  
behavior among agro-food  
processors



# Conceptual framework

- In this case the pole is the urban area while the periphery is the rural marginalised area.
- The food innovations are concentrated in urban areas and its expansion into rural areas would be achieved through industrial planning and integrating the rural areas into the global food value chain.

# Methodology of Research

<b>Study area</b>	<b>Kenya: Busia and Nairobi Counties</b>
Sampling techniques	Fisher technique (Nairobi) and snowballing (Busia)
Scale of measure	Ordinal
Population, Sample and response rates	2096; 180; 132 MSEs manufacturing foods
Reliability test	Cronbach: 0.97 reliability
Philosophical worldview; method of inquiry	Positivist constructivism; mixed methods
Study design	Survey: Open and closed ended questionnaires, & interviews, documents review & participant observation
Data analysis	Descriptive: percentages, means, standard deviation & Inferential: Mann Whitney U statistics
Presentation	Diagrams, tables and charts.

## Results and research findings

- there is no significant difference in technology adoption behaviour between urban and rural agro-food manufacturing micro and small enterprises (*Mann-Whitney  $U=722.2$ ,  $p=0.465813$ ,  $sig \geq .05$ , 2-tailed*).

# Continuation results

- However, the rural entrepreneurs found technology more **complex** to use (*Mann-Whitney  $U=485.000$ ,  $p=0.000$ ,  $sig<.05$ , 2-tailed*)
- that rural-based MSE's technology anxiety for **production function** (*Mann-Whitney  $U=252.000$ ,  $p=0.003$ ,  $sig<.05$ , 2-tailed*) was not equal to urban-based enterprises.
- Rural based enterprises' **experiences** with technology are not as good as urban based enterprises'. (*Mann-Whitney  $U=573.000$ ,  $p=0.003$ ,  $sig<.05$ , 2-tailed*).
- Level of **compatibility** among MSEs in urban is higher than rural regions (*Mann-Whitney  $U=710.000$ ,  $p=0.016$ ,  $sig<.05$ , 2-tailed*).
- Agro-processors in rural regions incur more **costs in maintaining** the manufacturing plants than their urban counterparts (*Mann-Whitney  $U=683.000$ ,  $p=0.027$ ,  $sig<.05$ , 2-tailed*).

# Conclusion

- technology adoption between Nairobi (urban) and Busia (rural) MSEs is not significantly different.
- However, technology **complexity, production function, compatibility** and **cost of repair** differed between rural and Urban MSEs

# Recommendations

Action	Actors
Establish a <b>data base</b> of all agro-food MSEs	County and National Governments
Promote specialised food value-chains that are easily found and cheaply manufactured in a given geographical area & replicate best practices to other regions.	The Governments, research institutions and agro-food processors
Enhance infrastructural planning and development so as to foster collective efficiency and competitiveness for food manufacturing MSEs in rural areas	County and National Governments
consider socio-cultural aspects in order to make food innovation systems that are compatible with the environment and the operators	Technology fabricators

# Suggestions for further studies

- The mediating role of research institutions and government in creating equilibrium in use of technology between the rural and urban agro-food processors.

End

Thanks

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Be blessed