

# Process and product innovation in small food manufacturing firms in South Kivu (Eastern of the DR of Congo)

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# INTRODUCTION

- Congolese industrial sector had been neglected and abandoned for several decades.
- Following multiple politic crises, plantations and fields were devastated leading to a serious decrease in crops, fish and animal production
- High corruption also negatively affects the capacity and functioning of institutions, hindering investment and entrepreneurial activity (Sebigunda, 2013).
- The DRC especially South Kivu province heavily relies on food imports
- Nowadays South-Kivu agri-food sector is mostly composed by unregistered and micro enterprises that lack internal resources and institutional support
- Considered as low-tech sector, the agri-food sector uses scarcely scientific input to innovate (Schmooker, 1996) is stimulated by market demand rather than scientific discoveries

## Introduction...

- Innovation in food sector is considered as one of the most the important factors enhancing competitiveness and growth
- however in developing countries, there is an acute lack of resources and institutional support enabling it (Chen and Puttitanun, 2005).
- Tidd (1997) argues that the innovativeness of a small firm “*is strongly conditioned by national and regional context in which it operates*”.
- Product innovation: the creation and subsequent introduction of a good or service that is either new, or an improved version of previous goods or services (Goel and Nelson 2018, Okumu and Buyinza 2018, Harrison et al. 2014).
- It also the implementation of a new or appreciable improved method of production or distribution or provision (Guilhon, 1993).
- ***What are determinants of process and product innovation in micro and small sized enterprises in the eastern part of DR Congo?***

## HYPOTHESIS

- The first hypothesis suggests that the manager's or entrepreneur's characteristics influence on firm's innovation behavior..
- The Second hypothesis posits that the firm location affects innovation. Firms located in rural areas will be less likely to innovate than those based in urban areas. Workforce training and skills are regarded as contributors of product and process innovation
- Third, small firms rely on external source of information to enhance their ability to innovate. Collaboration with similar firms, local association or cooperative, supply contract with supermarket or local economic operators will positively contribute to enhance firm's innovativeness.

# CONCEPTUAL FRAMEWORK

## Internal sources of innovation

### *Manager's characteristics*

- Age
- Education
- Training and skills
- Experience

### *Firm's Characteristics*

- Size
- Localization
- Proprietorship
- Workforce training and skills

## External sources of innovation

- Similar firms
- Equipment supplier
- Supply Contract

**Product and process innovation**

Source: adapted conceptual framework from Avermaete, et al. (2004)  
and Goel and Nelson (2018)

# METHODOLOGY

- The survey was conducted in South Kivu in Bukavu city and its surroundings areas, mainly Ruzizi plain in order to make a comparison of food processing firms in the study area
- Data were gathered directly from entrepreneurs (top managers or the firm owner) in a survey personally administered from April to August 2018
- The sample for the survey was drawn from multiple sources, agro-processors listings, associations. Due to the absence of public register on small business, we managed to spot the survey through the concentration of processing firms at a workplace
- 92 small firms were surveyed
- Data analysis was conducted using SPSS 24 and STATA24 software. Means, standard deviations, tables were used to explain some differences between variables
- binary logit model has been performed to explain the prediction of each variable for product and process innovation.

## RESULTS



# MANAGER'S CHARACTERISTICS

Variables		Rural	Urban	Mean
Gender	Male	91,6%	81,8%	-
	Female	8,4%	11,2%	
Age	<25ans	2	5	37,9
	25-34ans	10	23	
	35-44ans	15	15	
	45-54ans	10	2	
	55ans >	7	3	
	Means	34,5	41,6	
Education	Uneducated	3	4	Secondary
	Primary	11	5	
	Secondary	29	17	
	University	5	18	
Experience	< 10 years	34	22	8,22
	10 - 19years	11	16	
	20 years >	3	6	
	Means	6,6	10,5	
Training	Yes	31,2%	43,2%	-
	No	68,8%	56,8%	

# WORKFORCE AND PROPRIETORSHIP

Location	Numbers	Workforce (Employees)			Proprietorship	
		fulltime	Part-time	Previous	Private	Cooperative
		Means ± Std. Deviation				
Rural	48	2,8± 1,32	2,1± 2,09	0,5± 1,4	38	10
Urban	44	6,5± 6,41	3,5± 4	5,4± 6,8	40	4
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Total					92	

## FUNDING AND FIRM PROPRIETORSHIP

Source of funding	Frequency	Percent
- Family	4	4,35
- Informal credit	8	8,7
- Own funding	28	30,45
- Informal Credits and own funding	52	56,5
<b>Manager proprietorship</b>		
- No	31	33,7
- Yes	61	66,3

## TYPES OF INNOVATION GROUPS

Location	Process		Product		Process and product	
	Number	%	Number	%	Number	%
Urban	34	37	15	16,3	18	19,6
Rural	20	21,7	10	10,9	12	13
Total	54	58,7	25	27,2	30	32,6

## LOGIT MODEL RESULTS

VARIABLES	Process (1)	Process (2)	Process (3)
Age	0.27271 (0.33469)	-184.309 -128.219	-111.889 -110.117
Ages		0.41286* (0.24478)	0.33446 (0.21780)
Education	0.98117** (0.40015)	1.25906*** (0.45113)	1.09778*** (0.38744)
Locfirm	-0.96964 (0.62596)	-1.13357* (0.65222)	-1.44669** (0.57619)
WFform	-0.18800 (0.61143)	-0.25913 (0.63438)	
Suppequip	-0.28447 (0.83329)	-0.10142 (0.87159)	
Contract	1.42985** (0.60272)	1.44015** (0.61680)	1.50613** (0.58665)
Constant	-4.48597** -207.234	-228.354 -232.208	-138.198 -193.953
Observations	92	92	92

## CONCLUSION

- 92 manufacturing firms were surveyed, 58,7% introduced process innovation
- The first hypothesis related to the manager (entrepreneur) 's characteristic (especially his/her education background, experiences and age) was partially confirmed.
- The second hypothesized was fully confirmed stated that location and lack of trained workforce were negatively corelated to innovation.
- Finally, the third hypothesis also partly confirmed as equipment supplier were negatively while collaboration with similar firms was not significant. However,
- Supply contact with local customers and supermarket seem to have significant correlation with small firm innovation.
- Although there have been small firms that introduced the process innovation, unfortunately their number still insignificant in the South Kivu agrifood sector

## RECOMMANDATIONS

- Internally : managers and workforce training
- Externally : technical support, collaboration with similar firms,
- Policymakers : provide financial support, facilitate equipment acquisition and finally by lighten business environment.
- A deeper insight into processing activities and the level of technical efficiency, strategies used to survive in open market can contribute to enhance firms awareness on innovative activities and technical measure to adopt to be performant and successful.
- Our study opens up a venue for further research in small food firms.
- Questions can arise from this research concerning the technical efficiency and competitiveness of these small firms in an open market like South-Kivu

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