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IMPACT OF TECHNOLOGICAL INNOVATION ON THE GROWTH OF INTERNATIONALIZED SMALL ENTERPRISES: A CASE STUDY BASED ON TECH-BASED INTERNATIONALIZED SEAFOOD PROCESSING SMALL ENTERPRISES OF PUTTALAM DISTRICT IN SRI LANKA

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Abstract

The main aim of this study is to identify the impact of Technological Innovation (Technopreneurship) on Enterprise Growth with special concern on tech-based internationally oriented Seafood Processing SEs in Puttalam district of Sri Lanka as the existing gap of this research's scope is very much high in Puttalam district. This research considers mainly four types of Technological Innovation based on Machine Technology, Computerized Operations, Mobile Technologies and Other Communication Media Technologies. From the sample of 33 tech-based internationally oriented Seafood Processing SEs out of the total population of 39, primary data is collected using a questionnaire followed by a Descriptive plus an Ordered Logistic Regression Analysis was performed. According to the results, the growth of Machine Technology, Computerized Operations, Mobile Technologies and Other Communication Media based Technological Innovation (Technopreneurship) lead for Enterprise Growth. The more current the extents of Machine, Computerized Operations, Mobile and Other Communication technologies, the higher the positive contribution for Technological Innovation performance. Also, the Machine Technology Usage is high thus the Innovation performance based on Machine Technology is almost 50% while the Computerized Operations Usage is low. Among the users, the Innovation performance is at a higher level. Present Mobile Technologies Usage is high, thus the Innovation performance based on Mobile Technologies is almost 55%. Though the Other Communication Media Usage is high, only 53% performed innovation. Inadequate finance, poor awareness on international market conditions, lack of the knowledge and trust along with inadequate infrastructure are identified as the main reasons for the lower orientation of internationally oriented Seafood Processing SEs. To promote tech-based internationally oriented Seafood Processing SEs in Puttalam district, providing tech-education among SE owners is essential where there is a requirement of internationally oriented Seafood Processing Industry Establishment of a good financial and credit assistance and a comprehensive national policy for the international operations of tech-based Seafood processors are also essential.

Keywords: Technological Innovation, Tech-Based Internationally Oriented Seafood Processing SEs, Enterprise Growth

1. Introduction

Though there is a highly globalized and technologically scenario in the world holistically, the individual countries contributions to the improvement of the technology are varied continent to continent, region to region and country to country. Concerning the innovation perspective, the same scenario applies as nation to nation, region to region, the extent of innovation is different. When it takes these two terms of 'technology' and 'innovation' to 'technology' plus 'innovation', it derives the modern term 'Technopreneurship' where it can be concisely denoted as 'Technological Innovation'. The main question here is "How does the level of Technological Innovation of Sri Lanka's tech-based internationally oriented Seafood Processing SEs contribute to the Enterprise Growth?" The objectives of this study are as follow: the identification of the present level of Technological Innovation of tech-based internationally oriented Seafood Processing SEs in Puttalam district, explaining the relationship of Technological Innovation on Sri Lanka's tech-based internationally oriented Seafood Processing SEs growth, identifying whether there is any effect from the different extents of technologies for Technological Innovation performance of tech-based internationally oriented Seafood Processing SEs. Identifying reasons for the lower orientation of Sri Lanka's tech-based internationally oriented Seafood Processing SEs towards technology based innovation, and also how to promote technology based more value addition Technopreneurial internationally oriented Seafood Processing SEs in Puttalam district and in Sri Lanka.

This study is really important in many aspects for Sri Lanka. Though it is considered as one of the best sources of seafood in the world, this great resource is underutilized presently, as the indigenous seafood processing SEs are processing only a small fraction of seafood thus minimal in technology usage and execution of technology based innovation. Seafood Processing industry is considered as an important element in Sri Lanka's economy. (Ministry of Policy Planning and Economic Affairs, 2013). Seafood industry in Sri Lanka serves the country in terms of employment, output, export, foreign currency earning etc. and it contributes largely to the Sri Lankan economy in most aspects.

Concerning this study, its full focus is on Puttalam district of Sri Lanka, taking the 3rd place under the topics of underdevelopment and poverty in the country. Mundalam and Kalpitiya DS divisions are two DS divisions out of total sixteen DS divisions in Puttalam district which are authenticated as 4th and 5th places respectively in terms of poverty and underdevelopment out of its 25 districts. Moreover, the lowest percentage of 3% which passes the G.C.E A/L is recorded at Wanathawilluwa DS division in Puttalam district (Ministry of Policy Planning and Economic Affairs, 2013). Region to region, country to country, district to district and DS division to DS division, the key economic indicators varies thus for the efficient and effective decision making and policy formulation based on regional wise, country wise, district wise and if can, different DS divisional wise is really important for the enhancement and improvement of the individual DS divisions and districts. Thus, especially it positively affects the country's context where the underdeveloped DS divisions and districts in Sri Lanka can convert the present poor and underdeveloped DS divisions and districts status to developed DS divisions and districts status which ultimately contributes to the country's entire economy positively and significantly. Though the government's aim is to streamline every district's individual economies to reasonably support for the entire Sri Lankan economy, district wise, the degree of deviation is at a higher level in terms of infrastructure, education, population, economic sector composition and contribution etc.

Presently, since the Puttalam district posses the 3rd place of Sri Lanka under the criteria of 'underdevelopment' and 'poverty' (Ministry of Policy Planning and Economic Affairs, 2013), there is a huge responsibility on all the government and private parties to assist Puttalam district from every mean to improve its current under-develop state to a develop state by correctly tapping the districts full potential. According to the stats of Ministry of Policy Planning and Economic Affairs (2013), 4.4% of the establishments are located in Puttalam district which provides employment at around 3.5% of the labor force in Sri Lanka. Because of the seafood processing industry's vitality, it is important to elaborate the up to date status of the industry in Sri Lanka. The entire industry comprises of 8971 establishments, employing over 37321

employees in the country (Ministry of Policy Planning and Economic Affairs, 2013). Since this research study encompasses seafood-processing industry, it is essential to use up to date stats of Puttalam district on seafood processing Industry. Out of Puttalam District's establishments, 10.25% of establishments are coming under the seafood processing Industry thus provide employment for 20.5% of the population in the district (Ministry of Policy Planning and Economic Affairs, 2013). These newest stats of the country clearly depicts the vitality of seafood processing industry in Puttalam district's perspective as this untapped seafood processing category can positively and significantly support for the entire district's core economic indicators thus lead to back the entire country's key economic indicators and variables positively and reasonably.

2. Literature Review

The link between technology with entrepreneurship (Technological Innovation) and ensuring the growth of Tech-based Small Enterprises(TSEs) in a given economy has long been accorded a prime place in business, management and economics which still, remains inadequately touched (Dutse *et al.* 2013). Technological innovation is the most appropriate term that every nation in present highly technology driven world should follow to become a great nation. The technology is the wealth of nations as it is true that the cutting edge technologies offer the countries more competitive edge plus immense of opportunities to be rich. Schultz (1961) and Denison (1962) have suggested that a large part of enterprise growth which leads to economic growth cannot be accounted for by conventional production factors in their work on the US economy. Schumpeter (1950) views that the entrepreneurship is a force of 'creative destruction' which is primarily concerning 'value addition'. The development and sustainable growth of the new and existing ventures is a sign of healthy and fruitful entrepreneurial activities in a society. Technological innovation is a process of merging technology prowess and entrepreneurial talent and skills (Selvarani and Kanagaraj, 2015).

Internationalization is an important phenomenon over the past few decades where extensive research had carried out to expand the internationalization literature from a multitude of perspectives. Early internationalization theories were based on the economic rationale. Industrial Organization theory by Dunning (1988) is based on the logic that overseas operations are more costly and therefore requires offsetting advantages such as imperfections in factor markets. According to Dunning's eclectic explanation (1988), the firm's decision to enter a foreign market and the choice of entry depend on its ownership-specific advantages, internalization-specific advantages, and location-specific advantages. Many scholars argue that internationalization is associated with and explainable with entrepreneurship theories and related to the phenomenon of rapidly Internationalizing New Small Ventures (INSV) to entrepreneurship (Zahra and George, 2002).

The Sri Lankan economy is comprising of micro, small and medium scale businesses largely representing more than 85%, thus majority of the businesses are coming under the Micro and Small Enterprises (MSEs) category. The Seafood Processing category SEs plays a significant role from the entire proportion of SEs in Sri Lanka. As economic Census result indicates, the industry is employing over 60,000 people in them (Ministry of Policy Planning and Economic Affairs, 2013). Out of the total Seafood Processing SEs, Internationally driven Seafood Processing SEs play an important character on the Sri Lanka's export earnings generation, which is one of the leading economic indicators of the country. As far as the Puttalam district is concerned, it possesses the 3rd place under the terms of 'underdevelopment' and 'poverty' in Sri Lanka (Ministry of Policy Planning and Economic Affairs, 2013). Out of Puttalam District's total 4.4% of establishments holistically, 2.5% is coming under the Seafood and Seafood affiliated enterprises. Thus, out of 2.5%, 1.7% is related with Seafood Processing & related products category (Ministry of Policy Planning and Economic Affairs, 2013).

Since this is the scenario, internationally oriented Seafood Processing SEs have more responsibility towards the Sri Lankan economic and social perspectives as to contribute more to the country from most of the avenues. This is the place where the doubt arises where more contribution from internationally oriented Seafood Processing SEs is highly questionable in Sri

Lankan context because more than 90% of SEs are having traditional general practices and conventional business activities. Moreover, a great deal of SEs do not have a proper plan for their international business operations, any scope, lack of entrepreneurial skills, technology, finance, management skills etc. The most regretting fact is that, most of the internationally oriented Seafood Processing SEs do not possess the required level of appropriate up to date advanced technologies, technological equipments and tools thus less awareness on international market trends. According to Wickramasinghe (2011), the percentage of value addition is only 3.3% by the SEs established under the Seafood and Seafood affiliated enterprises category in Sri Lanka, thus the extent of technology usage of internationally oriented Seafood Processing SEs in the world is very much high as most of the internationally oriented Seafood Processing SEs in other countries have given higher importance to the open technology based innovation (Lichtenthaler, 2008).

These stats clearly elaborate that the Sri Lankan internationally oriented Seafood Processing SEs value addition for the Sri Lankan rural economies and for the entire country's national economy is really in a worse state. Therefore, Sri Lankan internationally oriented Seafood Processing SEs are at a lower level of up to date technology adaptation and technological advancements usage plus international orientation for their operations when compared with the global Seafood processing context.

3. Methodology

3.1. Research Design

For this study, the tech-based internationally oriented Seafood Processing SEs in Puttalam district is selected. The sample is drawn from the internationally oriented Seafood Processing SEs in Puttalam district which are coming under the category of employees 5-24 according to the Industry & Construction division of Non-Agricultural Activities in Sri Lanka by the Ministry of Policy Planning and Economic Affairs (2015) economic census. Primary data is collected from the sample to test the hypothesis. To measure the technological innovation and enterprise growth, the unit of analysis is the entrepreneurs (owners) of internationally oriented Seafood Processing SEs in Puttalam District. The total population of the internationally oriented Seafood Processing SEs in Puttalam district which are coming under the above category of employees 5-24 (Industry & Construction division) is 39 ('SampathPathikada' resource base). Sample size is 33, which is drawn from the tech-based internationally oriented Seafood Processing SEs of total 16 Divisional Secretariat divisions in Puttalam district. Simple Random Sampling is used to take the sample of a 33 from the internationally oriented Seafood Processing SEs in Puttalam district. The respondents contact face to face directly and through the telephone.

A structured questionnaire which is consisting of 3 Point- Likert scales/ Nominal scales are used to measure the dimensions. Before conducting the questionnaire survey, a pilot study is carried out with few respondents to confirm the validity of the constructs. Few deep in-sighting interviews with few entrepreneurs (owners) are also carried out to improve the qualitative and quantitative findings of the research study. An Ordered Logistic regression analysis is used as per the Inferential(Multivariate) Statistical analysis.

3.2. Conceptual Framework

Technological innovation measures the tech-based internationally oriented Seafood Processing SEs performance of Machine Technological Innovation, Computerized Operations based Innovation, Mobile Technological Innovation and Other Communication Media based Innovation (Dutse *et al.* 2013). Enterprise growth signifies by the main two dimensions of Output and Sales where increases in output, increase in output(product) quality and increase of new facilities, increase in profits represent the indicators of the above two main dimensions respectively (Dutse *et al.* 2013).

The hypotheses of this study are as below:

H₁: The Growth of Machine Technological Innovation (Technopreneurship) drive leads to Enterprise Growth.

H₂: The Growth of Computerized Operations based Technological Innovation (Technopreneurship) drive leads to Enterprise Growth.

H₃: The Growth of Mobile Technological Innovation (Technopreneurship) drive leads to Enterprise Growth.

H₄: The Growth of Other Communication Media based Technological Innovation (Technopreneurship) drive leads to Enterprise Growth.

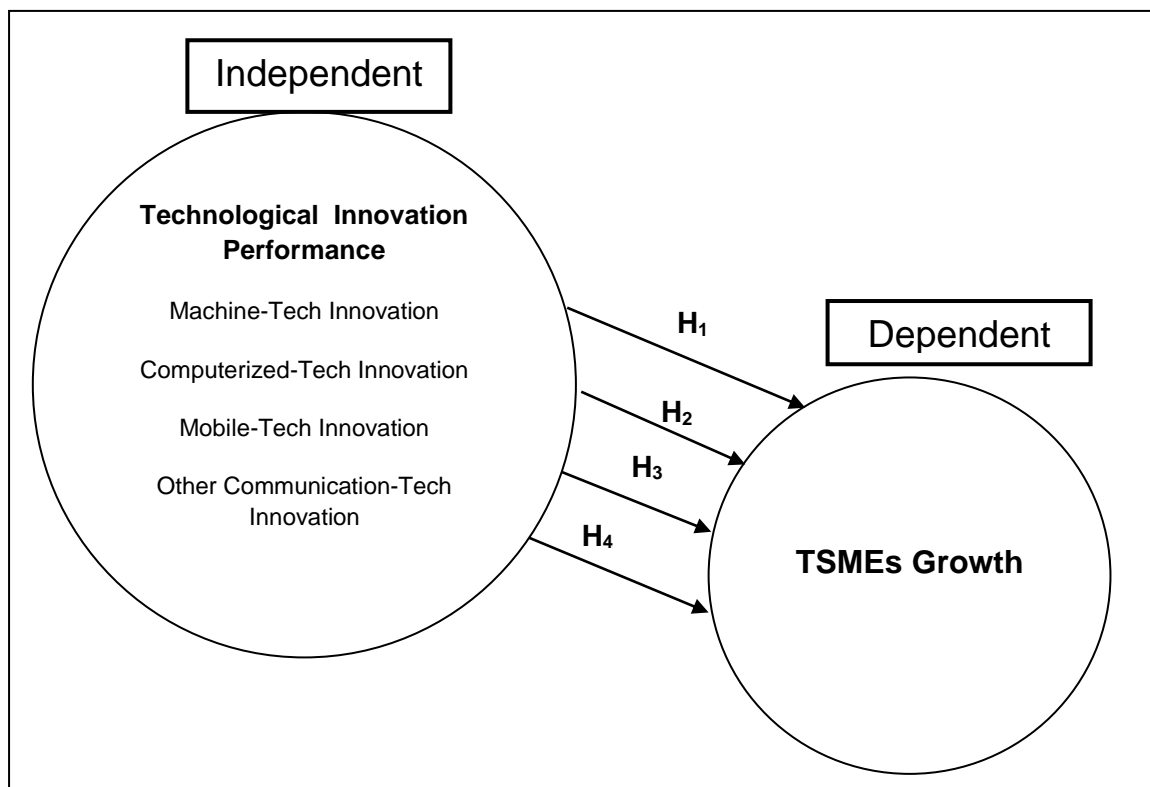


Figure 1. Conceptual Framework of the study

4. Findings

In accordance with the identification of the present level of technological innovation of tech-based internationally oriented Seafood Processing SEs in Puttalam district, according to the research results, the Machine Technology Usage of tech-based internationally oriented Seafood Processing SEs owners in Puttalm district is 100%.The Innovation performed from the Machine Technology Usage by the internationally oriented Seafood Processing SEs owners is 49% while 51% has not performed any innovation. Derives that, though the Machine Technology Usage is high, the Innovation performance based on Machine Technology Usage is almost half by the tech-based internationally oriented Seafood Processing SEs in Puttalam district.

Moving on to the Innovation from Usage of Computerized Operations by the tech-based internationally oriented Seafood Processing SEs owners in Puttalm district, as per the research results, Computerized Operations Usage of tech-based internationally oriented Seafood Processing SEs owners in Puttalm district is 43%. Accordingly, from the 43% of computerized operations users, a 74% performed innovation using Computerized Operations while 26%has not performed any innovation. Concludes that, the Computerized Operations

Usage is low in tech-based internationally oriented Seafood Processing SEs in Puttalam district thus among the computerized operations users, the Innovation performance is at a higher level.

When it comes to the Innovation from Mobile Technologies Usage by the tech-based internationally oriented Seafood Processing SEs owners in Puttalam district, the Mobile Technologies Usage is 100%. The innovation performed by the mobile technologies users of tech-based internationally oriented Seafood Processing SEs category in Puttalam district, from the 100% of mobile technology users, a 57% performed Innovation using Mobile Technologies while 43% has not performed any innovation. Derives that albeit the Mobile Technologies Usage is high, the Innovation Performance based on Mobile Technologies Usage is almost 60% of the tech-based internationally oriented Seafood Processing SEs in Puttalam district.

Emphasizing on the Innovation from Other Communication Media usage by the tech-based internationally oriented Seafood Processing SEs owners in Puttalam district, the Other Communication Media Usage is 100%. The innovation performance by the tech-based internationally oriented Seafood Processing SEs in Puttalam district, from the 100% of Other Communication Media users, a 52% of tech-based internationally oriented Seafood Processing SE owners performed innovation while 48% has not performed any innovation.

When explaining the relationship of Technological Innovation on Sri Lankan tech-based internationally oriented Seafood Processing SEs internationally oriented Seafood Processing SEs growth, the research study found that the growth of Machine, Computerized Operations, Mobile Technologies and Other Communication Media based Technological Innovation leads to Enterprise Growth. Therefore, the growth of Technological Innovation of tech-based internationally oriented Seafood Processing SEs internationally oriented Seafood Processing SEs lead for Enterprise Growth.

The research findings on the effect from the different extents of Machine, Computerized Operations, Mobile and Other Communication Technologies for Technological Innovation performance reveals that higher the Extent of Machine Technology Usage, Computerized Operations Usage, Mobile Technologies Usage and Other Communication Media Usage higher the performance of Machine, Computerized Operations, Mobile Technologies and Other Communication Media based Innovation

When identifying the reasons for the lower orientation of Sri Lankan tech-based internationally oriented Seafood Processing SEs towards technology based innovation, many internationally oriented Seafood Processing SEs owners of the Puttalam district are not in a good financial position to adopt new technologies. Moreover, the cheap awareness of the internationally oriented Seafood Processing SEs owners on rapidly changing international market conditions, norms & practices. Besides, poor awareness of the owners on new technologies and advancements is also high. Moreover, most of internationally oriented Seafood Processing SEs owners are lacking of the knowledge on most of the new technologies and improvements, international market trends thus the tech-based internationally oriented Seafood Processing SEs owners trust worthiness on new technologies is less thus owners are lacking of adequate infrastructure require for these new technologies and improvements.

5. Conclusion

According to the derived results from the analysis which is totally based on the primary data collected from the selected sample of tech-based internationally oriented Seafood Processing SEs in Puttalam district, the present level of Machine Technology Usage is high but the Innovation performance based on Machine Technology Usage is almost half by the tech-based internationally oriented Seafood Processing SEs in Puttalam district. The Computerized Operations Usage of internationally oriented Seafood Processing SEs in Puttalam district is low thus among the computerized operations users, the Innovation performance is at a higher level. Despite the Mobile Technologies Usage is high, the Innovation performance based on Mobile Technologies Usage is 55% of the tech-based internationally oriented Seafood Processing SEs in Puttalam district while 100% of Other Communication Media users, 47% of internationally oriented Seafood Processing SEs owners have not performed any innovation. Further reveals that the growth of Machine Technology, Computerized Operations, Mobile Technologies and

Other Communication media based Technological Innovation of tech-based internationally oriented Seafood Processing SEs lead for Enterprise Growth. Meantime elaborates that higher(up to date) the extents of above Machine, Computerized Operations, Mobile and Other Communication technologies, higher the positive contribution for technological innovation performance. Moreover identified that the main reasons for the lower orientation of Sri Lanka's tech-based internationally oriented Seafood Processing SEs including Puttalam district's internationally oriented Seafood Processing SEs towards technology based innovation thus directly linked with the reasons of inadequate financial position to adopt to the up to date new technologies(highest extents), poor awareness on international market conditions, lack of the knowledge on most of the emerging new technologies along with lack of trust and lack of adequate infrastructure.

6. Proposed Strategies and Policy Implications

Concerning on the promotion of technology based more value addition technopreneurial internationally oriented Seafood Processing SEs in Puttalam district, it is very important to promote not only to execute innovation through just 'Entrepreneurship' concept but also to execute technological innovation through the break through concept 'Technopreneurship' among internationally oriented Seafood Processing SEs owners. For that, it is highly necessary provide fruitful tech-education to internationally oriented Seafood Processing SEs owners. The establishment of internationally oriented Seafood Processing Industry and SEs category aspects specific Business Incubator(BI) with high technology sense is also very important initiative. Establishment of a good financial and credit assistance plus the implementation of a comprehensive national policy to effect on technology based internationally oriented Seafood Processing Industry and other SEs in Sri Lanka can be done by the government.

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