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Agro-based SME's Readiness & Relative Perception of Institutional Support towards Innovation & Utilization of New Scientific Discoveries: A Case of Sri Lanka

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Abstract

Lack of tendency towards innovation and utilization of new scientific discoveries have been recognized as one of the growth retarding factors of Small and Medium Enterprises (SMEs), which further reduced their potential contribution to the national economy. Hence, this research aims to address the challenges faced by SMEs in the Agriculture sector in Sri Lanka when leaning towards innovation and utilization of new scientific discoveries and their relative perception on institutional support when adopting such strategies. A qualitative case study-based methodology was adapted, and a series of key informant interviews were held with 10 agro-based SME owners, using purposive sampling. An in-depth thematic analysis was performed to analyze the data gathered from the interviews. The study identified the persistence of many positive innovative strategies among SMEs and several retarding factors in the institutional level that demotivate them to be advanced in the business environment in terms of innovation. This study is important for the government institutions and relevant policymakers to identify their requirements, and thereby, implement customized supportive programs to overcome such constraints at the institutional level to permit a sustained growth of the SME sector of the country.

Key words: agribusiness, innovation & utilization of new scientific discoveries, institutional readiness, small and medium enterprises, technological challenges.

Introduction

The Small and Medium Enterprise (SME) sector is famed as an extremely important strategic sector for promoting economic growth and social development in both developed and developing economies (Asian SME Summit, 2009). Similar to many of the developing countries in the area, the SME sector of Sri Lanka also plays a significant role in the economy in terms of contributing to export earnings, GDP, mobilizing domestic savings, reducing unemployment, alleviating poverty, and distributing income (Vijayakumar, 2013). For instance, the SME sector in the country accounts for more than 75% of the total number of enterprises, contributes to 52% of Gross Domestic Production, and provides more than 45% of employment opportunities (Chen & Mitra, 2022).

Given these facts, previous evidence denotes many failures of SMEs in Sri Lanka (Vijayakumar, 2013). According to Priyanath and Premaratne (2014), 70% of SMEs are closed down within three years of commencement, and 60% of them occur within the first year of commencement. Existing literature in the field highlighted that SMEs face a plethora of challenges, in terms of sustainability challenges, global challenges, and technological challenges that inhibit their performance and growth potential (Beyene, 2002; Mukumba, 2014, Prasanna et al., 2019). However, many studies have cited a low tendency of SMEs towards innovation & utilization of new scientific discoveries, which falls under the technological challenges, as one of the primary growth retarding factors of SMEs, which becomes the main focus of this study.

Many scholars emphasize the low level of utilization of improved technologies by SMEs as a critical challenge confronting SMEs, especially in developing regions like Sri Lanka (Asare et al., 2015; Prasanna et al., 2019). Studies have also cited the structural rigidities of the economy, particularly institutional barriers and lack of technological advancement in the country, as technological challenges encountered by most SMEs (Bayarcelik, Taşel & Apak, 2014; Lee, Sameen & Cowling, 2015). Existing small business strategy literature indicates low adoption of innovative strategies in the business process as one of the key underlying reasons for such technological challenges (Vijayakumar, 2013; Priyanath & Premaratne, 2014). Moreover, Saunila (2020) emphasized that if a business is lack of innovative capacities and has a lower tendency to utilize new scientific discoveries, it won't survive in the competitive business environment.

Given these circumstances, scholars have suggested the need for institutional support in terms of government collaboration as a way of overcoming the challenges described

above (Kang & Park, 2012; Ratten, 2014). Accordingly, this research aims to address the noticeable lack of scholarly work on agro-based SMEs' readiness and relative perception on institutional support towards innovation & utilization of new scientific discoveries in Sri Lanka by identifying the current scenario of SMEs' readiness towards innovation & utilization of new scientific discoveries, the challenges/ barriers faced by SMEs in terms of innovation & utilization of new scientific discoveries, the relative perception of SMEs on institutional support towards innovation & utilization of new scientific discoveries and finally, providing recommendations for improving SMEs' capacity for innovation and utilization of new scientific discoveries.

Having understood the positive impact of agro-based SMEs on the country's economy, this study contributes to the existing literature by providing empirical evidence on SMEs' readiness towards innovation & utilization of new scientific discoveries, and subsequently, the study highlighted the agro-based SMEs' relative perception on institutional support when adopting to innovation & utilization of new scientific discoveries. Since this study use a developing country like Sri Lanka as a case study investigating aforesaid phenomena, this study can enrich existing knowledge in the field, especially for the Agro-based SME sector, particularly in developing countries. Hence the following research questions are raised in the survey: *What is the current scenario of SMEs' adoption towards innovation and utilization of new scientific discoveries? What are the challenges/ barriers faced by SMEs in terms of innovation and utilization of new scientific discoveries? And What is the relative perception of SMEs on institutional support towards facing such challenges?* Accordingly, the paper was structured as follows: Section 2 gives a brief review of the aforesaid research area, section 3 depicts the methodology adopted by the study, section 4 concerns with the empirical findings and a discussion on key points highlighted in the result part, and finally, section 5 presents the concluding remarks and policy considerations.

Review of literature

Definitions of SMEs

SMEs don't have an universal definition and they are defined differently depend on countries and regions using various parameters such as the number of employees, amount of capital employed, and the amount of turnover or nature of business (Jayasekara & Thilakarathna, 2013). By considering 132 economies' definitions on SMEs, the International Finance Corporation (2011) noted that most selected countries define enterprises with employees ranging between 10 to 50 as small-scale and 50 to 250 as medium-scale, respectively. The World Bank (2017) defines SMEs and large-scale enterprises based on the number of employees in terms of 5–19, 20–99, and more than 100 as small, medium, and large, respectively.

In the Sri Lankan context, based on the number of employees, 51-200 are considered as medium, 11-50 are considered as small and less than 10 are considered micro enterprises (Ministry of Industry and Commerce, 2015).

Types of innovations in businesses

Generally, there are various classifications of innovation types in businesses. The most prevalent type of innovation seems to be product innovation, which may refer to both new product offers and upgrades to already existing goods and services (Oke et al., 2007). Process innovation is another sort of innovation that entails developing or enhancing operational procedures for administration, service, or manufacturing (Khazanchi et al., 2007) as well as improvements in the systems, procedures, and reengineering work performed to create new services and products (Oke et al., 2007). For example, process technologies, operational and organizational practices may be enhanced, altered, or replaced with new and advanced processes to enable the production of new products and increase firm's competitiveness (Jayanthi & Sinha, 1998). By considering the Oslo Manual, OECD (1997) defined another type of innovation, technological innovation, as the creation of novel items and procedures or of specific technological advancements in already existing processes and products. Moreover, by considering the fact that the business model of a business represents the logic of the firm to recognize their customer values, to acquire a viable revenue, and to set up a cost structure for value capture (Teece, 2010), business model innovation is defined as the process of discovering a fundamentally advance and different business model in an currently existing business (Markides, 2006), In another aspect, market innovativeness is broadly defined as a process that include creativity in market analysis, advertising, and promotion, as well as in identifying new market opportunities and breaking into new market arenas (Andrews & Smith, 1996).

SME's adoption towards innovation and utilization of new scientific discoveries

The existing literature in the SME field highlighted technological advancement as one of the critical determinants in eliminating SMEs' business failures, especially in developing regions. It leads to enhancing the productivity and efficiency of production factors, including land, labor, capital, and other resources, which involves the process of innovation and invention in advance (Prasanna et al., 2019). The term "invention" involves the scientific discoveries required to upgrade the production system, whereas "innovation" implies the utilization of new scientific breakthroughs to commercialize products (Prasanna et al., 2019). According to Schumpeter's theory of entrepreneurship, innovation needs entrepreneurial skills to manage the existing or new resources to match new scientific discoveries in the production process

(Prasanna et al., 2019). According to Kafetzopoulos and Psomas (2015), innovativeness or innovative capability of a business is considered as the ability to continuously transform information and ideas into new goods, processes, and systems for the benefit of the organization and its stakeholders.

Businesses that invest in expanding their innovation potential are more likely to succeed in the future (Saunila & Ukko, 2014). Moreover, several scholars have stated low adoption of innovative strategies and new scientific discoveries as one of the key limitations in adapting to new technologies in SMEs (Prasanna et al., 2019). In some cases, they are unsure about the possible benefits from adopting to innovative strategies and new scientific discoveries; hence the management does not utilize their resources in areas such as training and development, research, and new product developments (Prasanna et al., 2019). Thus, adoption becomes challenging. Only in some cases, SMEs seek to acquire new innovative strategies and the details of new scientific discoveries from research institutes, governments, universities, and large-scale companies like Transnational companies (TNCs) and Multinational Companies (MNCs) (Choi & Lim, 2017). Therefore, institutional readiness is critical for SMEs to be aware of possible benefits of innovation and utilization of new scientific discoveries, especially in the present era of globalization.

Institutional support

Institutional arrangement in countries, in terms of government support plays a significant role in influencing SME's sustainability and performance via different approaches (Kang & Park, 2012; Thongsri & Chang, 2019). However, previous studies have provided insights from the institutional environment logic to argue that increases in institutional support for business will be associated with performance increases because government institutions regulate and motivate the behavior of actors in a given environment (Dunning & Lundan, 2008). They tend to shape the nature of a firm's innovative activities and enhance performance from different perspectives. Hence, institutional support in terms of business support services and related sectors, such as tax allowances, loans, information technology, productivity improvement assistance, and financial capital, would enrich firm performance in advance (Athambawa, Wickramarachchi & Puspakumara, 2017).

Therefore, any country's government should have a higher priority for economic growth by implementing preferential policies and institutional services, primarily focusing on innovative capabilities and utilization of new scientific discoveries in the SME sector. However, scholars have made several consensuses regarding the institutional arrangement of countries promoting SMEs.

Accordingly, Hurmerinta-Peltomdki and Nummela (1998) categorized business support services as "reactive" and "transitional" approaches, whereas the "reactive" process refers to businesses acquiring support services to address their short-term issues operations, and the "transitional" approach refers to the use of support programs to achieve long-term strategic goals.

Bennett (2008) states the policy methods that can support small businesses in terms of finance, providing information, providing specialist advice, and helping with training and development. Some other models of institutional support include direct financial assistance through loans, grants, subsidies; training services through numerous private and public sector organizations; establishing business collaboration and networking systems among SMEs in the same or different industries and creating public-private-producer partnerships systems which enables achieving a long-term success (Athambawa et al., 2017). Accordingly, successive governments in Sri Lanka have taken several steps to form a conducive environment for small and medium businesses by introducing several policy reforms, laws, supportive services, and providing greater incentives over the past years (Vijayakumar, 2013).

Materials and methods

Research methods

Due to the nature of the phenomenon studied in the study, we have adopted a qualitative, case study-based methodology. According to Mohajan (2018), qualitative research is a method used to narrow down a vast research field into one easily researchable topic, which provides an in-depth understanding of a particular scenario or a problem. Based on SMEs' high failure rate in Sri Lanka, an in-depth analysis is essential to determine the agro-based SMEs' readiness and relative perception on institutional support towards innovation & utilization of new scientific discoveries. Thus, the study adopted a case study based on analytical techniques.

Interviews are popular data collection methods in the case study-based research methodology, and hence, we conducted a series of key informant interviews (KII) to collect data from the sample respondents. In this connection, a well-developed and pre-tested interview guide was used. In such qualitative research, data saturation points could be recognized when the researcher realizes that the amount of information required to understand the problem under investigation is sufficient through experiences in in-depth interviews. Thus, the study reached 10 agro-based SME operators in in Sri Lanka, recognizing it as the data saturation point of the problem under investigation. The owner/ operator of the business was selected as the unit of analysis since they are the ones who primarily confront these challenges and their

views are highly significant in this regard. We have adapted to the purposive sampling technique while selecting the sample respondents, ensuring that they have a minimum of 10-15 employees in their workplace and a minimum of one-year business experience in the field, and assumed that they have sufficient knowledge about challenges they face when engaged in innovation and when utilizing new scientific discoveries and the degree of institutional support. The interviews lasted for 45-60 min on average, and the interviews were conducted via face-to-face meetings or over the phone, using the interview guide provided in Appendix 1.

The interview guide mainly consisted of open-ended questions. The first part of the interview guide elicited the demographic/ personal information of the sample respondents. The second part consisted of questions about SMEs' readiness and relative perception on institutional support towards innovation & utilization of new scientific discoveries. All the interviews were recorded with the permission of the sample respondents.

Research context and data analysis

We collected data from the SME operators in the agriculture sector in Sri Lanka since the industry contributes 7% for the country's GDP, employs around 2.072 million people, and contributes to 25.3% of the total workforce across all sectors in Sri Lanka in the year 2019 (Central Bank of Sri Lanka, 2019). Although the sector substantially contributes to the Sri Lankan economy, agriculture activities recorded only a marginal growth of 0.6 percent in the year 2019 in value-added terms, compared to the growth of 6.5% in the year 2018, due to the considerable decline in key agricultural activities including fishing, forestry, and plantation crops (including tea and rubber), and the slowdown in value-added of agriculture-related activities reflected in the sub-indices related to the Agriculture segment of Business Outlook Survey (BOS) conducted by Central Bank of Sri Lanka in 2019. However, this study is focused on thoroughly investigating the SMEs' readiness and relative perception on institutional support towards innovation and utilization of new scientific discoveries. Therefore, we conducted an in-depth thematic area analysis after transcribing and coding the data of interview recordings.

We took appropriate measures to verify our findings' reliability by using purposive sampling. This ensures that SME operators in the Agro-based SME sector are represented and maintains the data ambiguity (Shah & Corley, 2006). Subsequently, we carefully analyzed the interview data to identify the technology challenges faced by SMEs and their relative perception on institutional support towards innovation and utilization of new scientific discoveries.

Results and discussion

Since the methodology is guided by multiple case studies, the study adopted 10 SMEs in different sectors of Sri Lanka. Table 01 provides the classification of SMEs/ cases adopted for this study.

Table 01: Sample profile

Case no	Representative sector within agriculture	Number of employees
Case 01	Dairy products	12
Case 02	Dairy products	48
Case 03	Processed fruits & vegetables	29
Case 04	Processed fruits & vegetables	14
Case 05	Processed fruits & vegetables	08
Case 06	Processed fruits & vegetables	10
Case 07	Spices	28
Case 08	Spices	40
Case 09	Spices	20
Case 10	Handicrafts/ cultural/ recreational products	17

Source: Key informant interviews

Also, for the analysis of the findings, themes or patterns emerged from the previous literature were used. The analysis of the study is three-fold, where the findings are discussed over three sections. The first section discusses the current scenario of the SME's adoption towards innovation and utilization of new scientific discoveries. The second section discusses the challenges/ barriers faced by SMEs in terms of innovation and utilization of new scientific discoveries. The third section discusses the relative perception held by SMEs over institutional support towards innovation and utilization of new scientific discoveries.

Section 01: The current scenario of SMEs' adoption towards innovation and utilization of new scientific discoveries.

As discussed in previous sections also, results of the thematic area analysis suggested five ways of innovations that SMEs have adopted such as 1) Product innovation, 2)

Process Innovation, 3) Technological innovation, 4) Business model innovation and 5) Marketing innovation. Table 02 depicts the overview of thematic area analysis adopted to explore the current scenario of SMEs adoption towards innovation and utilization of new scientific discoveries.

Table 02: Analytical table

Thematic areas	Case 01	Case 02	Case 03	Case 04	Case 05	Case 06	Case 07	Case 08	Case 09	Case 10
Product innovation	*		*		*	*	*	*	*	*
Process innovation		*				*				
Technological innovation		*			*	*				
Business model innovation			*							
Marketing innovation			*					*		*

Source: Key informant interviews

As such, SMEs adoption towards innovation and utilization of new scientific discoveries was identified in terms of 1) Product innovation, 2) Process Innovation, 3) Technological innovation, 4) Business model innovation and 5) Marketing innovation from literature and further evident from the KIIs as discussed below.

Product innovation: According to the interviews held with most of the SMEs, it is evident that they have a greater tendency towards introducing new products to the market with the intention of competing with the large-scale industry peers. For instance, as evident from the case 01, *"these days, we are in the process of making a new fresh juice product to the market, in order to compete against leading companies in the market…".* Similarly, owner/ manager of case 10 also mentioned that they are trying to introduce 100% natural incense stick which is made out of sandal wood to the market.

Also, most of the owners/ managers of SMEs mentioned that they are trying to utilize their scientific knowledge or background to develop and improve the quality of their products further. For instance, as mentioned in case 05 *"Our innovativeness is what, we provide high moisturizer, high moisturizing form with vitamins E and glycerin. So, we use that particular two things and process we use. Using that thing we enhance the quality of the product. I think that is the innovativeness. And the other hand side doing my*

masters in industrial chemistry. So, I am going to apply that my scientific background or the scientific knowledge to my fertilizer products as well. So, what we are going to do is we are going to apply that scientific knowledge, that scientific thing into my fertilizers and to all of my other products. I think that is the innovativeness."

Interviews also highlighted how SMEs have innovatively used natural or biodegradable raw materials to develop eco-friendly products. Also, during the product development stage, the majority of them have adopted experimental tests or the trial-and-error method. For instance, as revealed in case 06, "*I always have the idea to do something with biodegradable materials and once idea came to my mind to do something with banana tree. First, I tried to produce a lunch sheet using banana leaf and it was not successful due to limited availability of raw material, because the features of banana leaf of local varieties are not appropriate enough to process. So, I gave up that and now in the experimental level on producing banana fiber board using banana stem. However, this product is quite successful …".* Similarly, this was moreover evident from case 09 *"We are now in the process of producing flour from dust released from the dehydrated pumpkin & jak fruit production".*

Process innovation: The KIIs of this study also revealed several types of process innovations adopted by SMEs to overcome certain barriers in their procedural systems. For instance, as evident from case 02, the company has adopted process innovation to separate out cream from their yoghurt product using refrigerator as a cost-effective method. For instance, as mentioned by the owner or manager of case 02, *"At the very early stage of the business, due to limited budget, we didn't have enough capital to purchase a cream separator, so we did experiments & found a way to separate cream via refrigerator. So, for a long time, we have adapted to that process to separate cream"*.

In addition, the owner or manager of case 03 mentioned, *"My employees brought the idea of selling cut vegetables to nearby hotels, from remaining vegetables in each day after-sales".* This practice closely reflects Kaizen concept – a combined meaning of two Japanese words, "Kai" (change) and "Zen" (better) – which mostly applied in technology exploitation and technology exploration in the firm innovation process. It indicates that a change in business process (innovation) or minimize the error points or waste of the business process, and thereby improving the production process's efficiency, could be achieved through everyone participating in the firm. Thus, the use of innovative ideas of workers in taking business decision by the respective company could be recognized as a constructive point which could be promoted among SMEs.

Technological Innovation: The study findings also revealed that some SMEs are experimenting new techniques to be utilized in their production process. For instance,

as mentioned by the owner/ manager of case 02, the company is in the process of discovering new techniques for their production. For instance, as mentioned by the owner or manager of case 02, *"Now I have moved towards silage production, where I have tried for bunker silages and through experiments, I got to know that bunker silages are not suitable for dry zone due to high temperature conditions and the limited harvesting capacity. So, the best option now is to move towards bail silage & now that is also at experimental level."*

Also, the findings revealed that how some of the SMEs (Eg: case 02 and case 06) have discovered waste recycling techniques to generate renewable bio energy sources as environment friendly cost-effective method to fulfill their energy needs. For instance, the owner or manager case 02 mentioned that they utilize a bio-gas plant, generated from their inner waste to use for their dairy production. Similarly, the owner or manager of case 06 also mentioned about utilizing his owned heat plant, generated from waste materials for the dehydration process.

Business model innovation: The KIIs of the study also highlighted certain innovations adopted in business models by SMEs to better serve the customer needs and wants. For instance, as evident from case 03, *"We have introduced the concept of delivering raw fruits & vegetables from farm to table, within 12 hours and maximum of 18 hours, because normally in Sri Lankan vegetable market, it will take around 30-36 hours to reach to customers., even in supermarket supply chain, it will take around 24-30 hours to reach customers."*

Marketing innovation: Concerning the discussions held with SMEs, it is evident that most of them have focused on the aspect of marketing innovation within their business process. In fact, most of the SMEs showed their alertness to existing market trends, when arriving at various marketing innovations. As indicated in case 03, case 08, case 09 and case 10, most of the SMEs engage in continuous market research to address the existing market gaps. For instance, the owner or manager of case 03 mentioned *"we are planning to sell scraped coconut to busy crowd in urban areas via our own outlets & planning to implement street food concept by offering bottled coconut water & some healthy food items like "katarolu" drinks targeting university students in our area".* As such the SMEs have strategized their marketing plans to address the existing gaps in the market.

Analyzing case 09 revealed that they had utilized market information to cater to low-end customers by producing a budget pack of soya meat. *"Yes…. Once we have introduced a budget soya meat pack for Rs. 30, especially targeting low-end customers who are focusing on a low budget, whereas none of the companies has yet been introduced".* A similar experience was reported by case 10.

"We are the one who first introduced the 'sambrani' in the packeted form to market, since that, there aren't such packeted products in the market except in a bulk form". Further, KII held with the owner or manager of case 08 revealed how the business opportunities emerged during Covid-19 pandemic period. As he mentioned *".... there's a growing demand for traditional spices with the effect of the Covid-19 pandemic, which leads to an increase in human immunity and warrants me to start this business. Further, I am planning to start a street food business to identify market opportunities, including customer preferences in other geographical regions, and expand operations accordingly".* This indicates that how SMEs utilize market information to identify changing consumer preferences and thereby discover new products according to the emerging trends.

Also, some SMEs focus on utilizing innovative labeling and packaging techniques to market their products. For instance, as evident from case 08, *"... First I did a market research & introduced traditional spice products along with a new plastic cup packaging, which is already new to the existing market and also the customer have the benefit to reuse the plastic cup again & again. Thereby, I believe that our product name would be remain in the minds of the customers for a longtime, while they are using the plastic cup for the household, unlike a polythene package. So, the product labels are my own designs and currently in the process of designing environment friendly paper packaging, targeting the international market, since I believe that it won't be success in the local market due to high cost of production".* Similarly, the owner or manager of case 10 has also mentioned *"We have recently introduced the diagonal shape packaging design to the market. Also, recently we have introduced 10 in one package including 100 incense sticks with 10 different types of fragrance in one large pack worth for Rs.200, since has not been introduced by anyone else in the market yet"*. As such SMEs strategically utilize various innovative techniques to get the customer attraction and to market their products.

Section 02: The challenges/ barriers faced by SMEs in terms of innovation and utilization of new scientific discoveries.

The results of the thematic area analysis highlighted various challenges faced by SMEs in terms of innovation or utilization of new scientific discoveries. The challenges include 1) Access to financial resources, 2) Access to human capital and, 3) Access to market information. Table 03 depicts the overview of thematic area analysis adopted to explore the challenges faced by SMEs in adopting for innovations and scientific discoveries.

Table 03: Analytical table

Thematic areas	Case 01	Case 02	Case 03	Case 04	Case 05	Case 06	Case 07	Case 08	Case 09	Case 10
Access to financial sources	*	*	*		*	*	*	*	*	*
Access to human capital		*		*		*				
External challenges	*	*	*	*	*	*	*	*	*	*

Source: Key informant interviews

As such, the challenges faced by SMEs in terms of innovation and utilization of new scientific discoveries were identified in terms of 1) Access to financial resources, 2) Access to human capital and, 3) Access to market information from literature and further evidence from the KIIs as discussed below.

Access to financial sources: Majority of the SMEs indicated the problem of limited access to financial capital sources, which act as a barrier for them to moving forward with their business process innovations. For instance, as mentioned by case 06, *"...now I am in the experimental level on producing banana fiberboard using the banana stem. This product is quite successful, but I have stopped production due to limited capital. I am planning to implement it in future."*

However, some SMEs tend to leverage their existing resources to the best of their knowledge to reach their targets without considering their financial hardships. For instance, as evident from case 02, *"At the very early stage of the business, due to the limited budget, we didn't have enough capital to purchase a cream separator. So, we did experiments and found a way to separate cream via refrigerator. So, for a long time, we have adapted to that process to separate cream.*"

Access to human capital: Concerning the discussions held with SMEs, the majority mentioned that the lack of skilled employees and lack of technically sound employees as a biggest challenge to innovations in their businesses. For instance, as mentioned by the owner of manager of case 04, *"The workers, they don't even know how to process mushroom. They are old people mostly".* This might be coupled with issues such as lack of access to trainings, increasing trend of aging population in the labor market and so on.

However, some SMEs have identified the innovative skills of their own employees and effectively utilizes those when reaching their business targets. For instance, as mentioned by owner or manager of case 05, *"Yes, for example, my sales executive. Personally, I know that he is very innovative, right. He has so many ideas. I remember that in the last Index exhibition, so we wanted to be unique. We wanted to have a unique stall with us. For that, I remember that my two executives put so many inputs, and we implemented those inputs, and we ended up with a good one. That is how. So, we use that kind of their ideas also most of the time".*

External challenges: The findings of the study revealed several other external challenges confronted SMEs from adopting innovations. Such challenges include lack of institutional support, lack of raw materials/ parts/ machineries, high tax and VAT on imports, and lack of infrastructure facilities etc. For instance, as mentioned by the owner or manager of case 06 *"As far as I experienced, most of the government officers are having negative views towards SMEs like us who operate in exportation. They however try to put barriers, not try to encourage or support us for our innovations. I think this system should be changed first".*

This indicates the barriers beyond their limits and shows the areas which required the institutional interventions in terms of discovering alternative techniques and materials, designing special financial packages to motivate innovative entrepreneurs, and developing the SMEs' human capital base.

Section 03: SME's relative perception of institutional support towards innovation & utilization of new scientific discoveries

When exploring SMEs' relative perception on institutional support towards facing technology challenges, some repeatedly stated their dissatisfaction throughout the interviews, especially regarding government support. Thus, the owner or manager of case 02 mentioned that most institutional setups are highly inefficient due to less flexibility and lack of workaholic nature. "*Actually, I hate the government sector. Most government officials are highly inefficient; they avoid their responsibilities. As far as I experienced, we can't find any flexible and workaholic culture in government institutes*". The negative impression of government support was clearly indicated by the interview made with case 04: *"If we consider the government support, it is like minus points in all the areas."* According to interview held with case 05, some government officials are even less updated in the latest technologies, which is the main barrier for SMEs to move ahead with their innovations and new scientific discoveries. Even the training programs conducted by some institutions are not at a satisfactory level.

The interview with the owner or manager of case 05 revealed that authorities are not ready to take the risk in adopting new innovations and scientific discoveries even they recommend it and cover part of the financial capital requirement. It indicates that officers who recommend the machinery do not have the confidence in generating its expected outcomes, and it also reflects the conditions of the proposed loan scheme. As per case 05: *"Recently, I dealt with an officer, who is working especially in Mushroom industry and provided infrastructure to develop the business to the next level. I need to contribute 50%, and they will give 50%. The advice they give was to import a mist machine from China. The cost is around LKR 80,000 to set up the net and install the machines, it costs a lot. I know how it works. It is not practical. They should try it by doing it before passing it to us. They asked us to do it without that. So why should I pay 50%? So, I denied it. I asked them to pay me to continue my way with new machines. How can I do which are impossible to do. They will provide a loan, and I need to pay it back with interest. But if the process is a loss, I need to bear it also."* As such he further stated that he had attended two or three training programs held for a new mushroom variety called *"Makadura White",* which are useless, and he was charged LKR 100 for the training certificate, which he has not yet received.

However, two respondents agreed and were satisfied with the support given by Vidhatha Resource Centre, Industrial Development Board (IDB), and Institute of Post-Harvest Technology (IPHT) in reaching the latest technologies. The owner or manager of case 06 indicated that *"Mainly the IPHT provides us with the necessary technical support ...."*. Similarly, owner or manager of case 01 revealed the support provided by IDB and Vidhatha Resource Center. *"IDB and Vidhatha Resource Centre always support us in updating new technology; for example, if we want a new machine to purchase, the field officer of Vidhatha Resource Centre takes us to a place where such machines are available and show how it works in advance".*

Further owner or manager of case 03 emphasized the role of government and related institutions like universities and research institutions to build up a proper system to direct and guide SMEs for research and development. *"As entrepreneurs, we always need technical support, market, and industry knowledge, and I am pretty much sure that most of the academics have done the good industrial and technical analysis; that would be beneficial for entrepreneurs like us, and they might publish those in conferences or journals, but the outcome should also be shared with us since we are the ones who practically involve in the industry. Agriculture Faculties should provide consultancies to Agribusinesses and start farmer-cells to open avenues for farming communities to get necessary advisory services".* This statement reveals the gap between the SME sector, recognized as the backbone of the economy, and research institutes, including higher education centers.

There are Business Incubation Centers in some countries attached to the universities to support the SME sector and cultivate entrepreneurial attitudes among graduates. Sharing the research findings with the SME sector will help them lead their businesses in a competitive environment and bridge the resource gaps. The interview conducted with case 09 revealed the lack of SMEs' readiness to gain the benefits from specifically designed SME development support programs. *"Recently, some businesses have received grants to buildup factories and purchase machinery. Whereas I still did not receive such. But I think there should be a commitment in our side also to be acceptable for such grants".*

Conclusion

In terms of innovation-utilization of new scientific discoveries, almost all respondents showed a greater tendency towards all aspects of the innovativeness in terms of product innovation, process innovation, technological innovation, business model innovation and marketing innovation. Specifically, some specific cases emphasized that they have made several commitments to go green in the innovation process and how they are using their innovative strategies to overcome the issues arose in the business process. Still, they repeatedly stated lack of institutional support, lack of financial resources, lack of technical knowledge to adopt to new technologies, and practical problems that arose when commercializing new products due to other competitive products in the market as the limitations towards new product development, suggesting the relevant authorities to provide effective solutions. In fact, the government and relevant authorities should consider developing effective market structures to favor those SMEs struggle in commercializing their new products by opening new trade centers, which those SMEs cannot reach.

When considering SMEs' overall perception on institutional support, many respondents showed a very low satisfaction in most of the areas mentioned above. Hence, the institutional mechanism should be further improved to assist SMEs in the Agribusiness sector to ensure it provide practical solutions to their issues. Moreover, many respondents revealed that many services provided by the government institutions are not satisfactory. Thus, there should be an appropriate performance evaluation mechanism to assess the services, and improve the quality of the support services. At the same time, proper training programs for entrepreneurs should be included in these services covering all the aspects such as marketing, finance, production, marketing, finance, etc. The authorities must also establish and appropriate mechanism to recognize the SMEs who have the innovative capability and thereby provide specific business development services to take their businesses to the next level.

Moreover, educational institutions such as universities can play a specific role in promoting SMEs to innovations and to reach the latest technologies. Moreover, research institutes and universities should focus on disseminating their new research findings to the industry and relevant authorities.

This contribution of this study is remarkable since the research findings have substantial relevance for both theory and practice. In essence, practitioners, particularly government officials and relevant authorities, can undeniably use these findings to understand the nature of challenges faced by SMEs and their relative perceptions on institutional support when reaching to innovation and utilizing new scientific discoveries. Even though this study is performed to identify common perceptions among the owner-managers of SMEs related to their readiness and institutional support in adapting to innovation and utilization of new scientific discoveries, the essence of it suggests that those aspects are mostly unique to the sector in which it is operated. Such evidence is very much important for the relevant institutions and policymakers to recognize SMEs' requirements, and thereby, implement customized supportive services to be sustained in the competitive economic conditions.

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References

Andrews, J., and Smith, D. C. (1996). In search of the marketing imagination: Factors affecting the creativity of marketing programs for mature products. *Journal of Marketing Research*, 33(2), 174-187. DOI: https://doi.org/10.1177/002224379603300205

Asare, R., Akuffobea, M., Quaye, W., and Atta-Antwi, K. (2015). Characteristics of micro, small, and medium enterprises in Ghana: gender and implications for economic growth. *African Journal of Science, Technology, Innovation and Development*, 7(1), 26-35. DOI: https://doi.org/10.1080/20421338.2014.979651

Asian SME Summit. (2009). Public-private partnership in SME development through capacity building, policy and research. Retrieved from http://www.philippinechamber.com/index.php.

Athambawa, S., Wickramarachchi, A. P. R., and Puspakumara, C. (2017). Business transformation through technology adoption: special reference to rice millers in Eastern Province, Sri Lanka. International Research Symposium on Pure and Applied Sciences 2017. Faculty of Science, University of Kelaniya, Sri Lanka.

Bayarçelik, E. B., Taşel, F., and Apak, S. (2014). Research on determining innovation factors for SMEs. *Procedia-Social and Behavioral Sciences*, 150, 202-211. DOI: https://doi.org/10.1016/j.sbspro.2014.09.032

Bennett, R. (2008). SME policy support in Britain since the 1990s: what have we learnt? Environment and Planning C: Government and Policy, 26(2), 375-397. DOI: https://doi.org/10.1068%2Fc07118

Beyene, A. (2002). Enhancing the competitiveness and productivity of small and medium scale enterprises (SMEs) in Africa: An analysis of differential roles of national governments through improved support services. *Africa Development: A Quarterly Journal of CODESRIA*, 27(3-4), 130-156.

Central Bank of Sri Lanka. (2019). *Annual report of central bank of Sri Lanka 2019*. Retrieved from https://www.cbsl.gov.lk/en/publications/economic-and-financial-reports/annual-reports/annual-report-2019

Chen, C., and Mitra, S. (2022, August 22). Five ways to connect Sri Lanka's small businesses to global value chains. Asian Development Blog. Retrieved from https://blogs.adb.org/blog/five-ways-connect-sri-lanka-s-small-businesses-global-value-chains

Choi, Y. S., and Lim, U. (2017). Contextual factors affecting the innovation performance of manufacturing SMEs in Korea: A structural equation modeling approach. *Sustainability*, 9(7), 1193. DOI: https://doi.org/10.3390/su9071193

Dunning, J. H., and Lundan, S. M. (2008). *Multinational enterprises and the global economy*. Edward Elgar Publishing, Gloucestershire, UK. pp.919.

Hurmerinta-Peltomdki, L., and Nummela, N. (1998). Market orientation for the public sector providing expert services for SMEs. *International Small Business Journal*, 16(2), 69-83. DOI: https://doi.org/10.1177%2F0266242698162004

International Finance Corporation. (2011) Financials and projects. Washington DC, USA: International Finance Corporation.

Jayanthi, S., & Sinha, K. K. (1998). Innovation implementation in high technology manufacturing: A chaos-theoretic empirical analysis. *Journal of Operations Management*, 16(4), 471-494. DOI: https://doi.org/10.1016/S0272-6963(98)00025-4

Jayasekara, J. P. D. R., and Thilakarathna, A. (2013, April). Government Policy and strategy for SME development. In The 4th IMF-Japan High-Level Tax Conference for Asian Countries. Retrieved from https://www.imf.org/external/np/seminars/eng/2013/asiatax/pdfs/srilanka.pdf

Kafetzopoulos, D., and Psomas, E. (2015). The impact of innovation capability on the performance of manufacturing companies the Greek case. *J Manuf Technol Manag*. 26 (1): 104–130. DOI: https://doi.org/10.1108. JMTM-12-2012-0117

Kang, K. N., and Park, H. (2012). Influence of government R and D support and inter-firm collaborations on innovation in Korean biotechnology SMEs. *Technovation*, 32(1), 68-78. DOI: https://doi.org/10.1016/j.technovation.2011.08.004

Khazanchi, S., Lewis, M. W., and Boyer, K. K. (2007). Innovation-supportive culture: The impact of organizational values on process innovation. *Journal of Operations Management*, 25(4), 871-884. DOI: https://doi.org/10.1016/j.jom.2006.08.003

Lee, N., Sameen, H., and Cowling, M. (2015). Access to finance for innovative SMEs since the financial crisis. Research Policy, 44(2), 370-380. DOI: https://doi.org/10.1016/j.respol.2014.09.008

Markides, C. (2006). Disruptive innovation: In need of better theory. *Journal of Product Innovation Management*, 23(1), 19-25.

Ministry of Industry and Commerce (2015). National policy framework for small and medium enterprises. Ministry of Industry and Commerce, Colombo. Retrieved from http://www.sed.gov.lk/sedweb/en/wp-content/uploads/2017/03/SME-framwork_eng.pdf

Mohajan, H. K. (2018). Qualitative research methodology in social sciences and related subjects. *Journal of Economic Development, Environment and People*, 7(1), 23-48.

Mukumba, T. (2014). Overcoming SMEs challenges through critical success factors: A case of SMEs in the Western Cape Province, South Africa. *Economic and Business Review*, 16(1), 19-38.

OECD (1997). OECD Proposed guidelines for collecting and interpreting technological innovation data-*Oslo Manual*. OCDE Publicantions Service, Paris.

Oke, A., Burke, G., and Myers, A. (2007). Innovation types and performance in growing UK SMEs. *International Journal of Operations & Production Management*, 27(7), 735–753. DOI: doi:10.1108/01443570710756974

Prasanna, R. P. I. R., Jayasundara, J. M. S. B., Naradda Gamage, S. K., Ekanayake, E. M. S., Rajapakshe, P. S. K., and Abeyrathne, G. A. K. N. J. (2019). Sustainability of SMEs in the competition: A systemic review on technological challenges and SME performance. *Journal of Open Innovation: Technology, Market, and Complexity*, 5(4), 100. DOI: https://doi.org/10.3390/joitmc5040100

Priyanath, H.M.S. and Premaratne, S.P. (2014). Government SME development programs in Sri Lanka: A review in the lens of transaction cost economics. *Sabaragamuwa University Journal,* 13(2). http://repo.lib.sab.ac.lk:8080/xmlui/handle/123456789/692 (ISSN) 1391-3166

Ratten, V. (2014). Future research directions for collective entrepreneurship in developing countries: a small and medium-sized enterprise perspective. *International Journal of Entrepreneurship and Small Business*, 22(2), 266-274. DOI: https://doi.org/10.1504/IJESB.2014.062505

Saunila, M. (2020). Innovation capability in SMEs: A systematic review of the literature. *Journal of Innovation & Knowledge*, 5(4), 260-265. DOI: https://doi.org/10.1016/j.jik.2019.11.002

Saunila, M., and Ukko, J. (2014). Intangible aspects of innovation capability in SMEs: Impacts of size and industry. *Journal of Engineering and Technology Management*, 33, 32-46. DOI: https://doi.org/10.1016/j.jengtecman.2014.02.002

Shah, S. K., and Corley, K. G. (2006). Building better theory by bridging the quantitative-qualitative divide. *Journal of Management Studies*, 43(8), 1821-1835. DOI: https://doi.org/10.1111/j.1467-6486.2006.00662.x

Teece, D. J. (2010). Business models, business strategy and innovation. *Long Range Planning*, 43(2-3), 172-194. DOI: https://doi.org/10.1016/j.lrp.2009.07.003

Thongsri, N., and Chang, A. K. H. (2019). Interactions among factors influencing product innovation and innovation behaviour: Market orientation, managerial ties, and government support. *Sustainability*, 11(10), 2793. DOI: https://doi.org/10.3390/su11102793

Vijayakumar, S. (2013). The status of small and medium enterprises and promotions for their growth in Sri Lanka. *International Journal on Global Business Management and Research*, 1(2), 1-12. Retrieved from http://www.rajalakshmi.org/ijgbmr (ISSN) 2278 8425

World Bank. (2017). *Enterprise Surveys*; World Bank Group: Washington DC, USA.