

Entrepreneurial Behaviour and Agribusiness Potentials in the Mushroom Industry in Sri Lanka

Colombo Economic Journal (CEJ)
Volume 1 Issue 2, December 2023: PP 1-20
ISSN 2950-7480 (Print)
ISSN 2961-5437 (Online)
Copyright: © 2023 The Author(s)
Published by Department of Economics,
University of Colombo, Sri Lanka
Website: <https://arts.cmb.ac.lk/econ/colombo-economic-journal-cej/>

I.V. Kuruppu¹, S.P. Fernando², L.D.S.D. Silva² and H.A.H.J. Hapuarachchi²

¹Department of Agribusiness Management, Wayamba University of Sri Lanka

virajithkuruppu@wyb.ac.lk

²Hector Kobbekaduwa Agrarian Research & Training Institute, Sri Lanka

sangeeth.nature@gmail.com, isuriruhunuge999@gmail.com,

hapuarachchihahj@gmail.com

Corresponding Author: I.V. Kuruppu

Received: 15 August 2023, **Revised:** 12 October, 2023, **Accepted:** 02 December 2023.

Citation: Kuruppu. I.V, Fernando. S.P, Silva. L.D.S.D, Hapuarachchi. H.A.H.J, (2023), Entrepreneurial behaviour and agribusiness potentials in the mushroom industry in Sri Lanka, *Colombo Economic Journal (CEJ)* 1 (2): 01-20. <https://arts.cmb.ac.lk/econ/colombo-economic-journal-cej>

Abstract

The study aims to explore the present status of the mushroom industry and the entrepreneurial behaviour of mushroom farmers in Sri Lanka. It was conducted across six districts in Sri Lanka using a sample of 289 respondents. Multi-stage random sampling was used in the study. Pre-tested structured questionnaire survey, Key Informant Interviews, Focus Group Discussions, and case study analysis were used to derive data. Entrepreneurial Behaviour Index (EBI) and the level of entrepreneurship for each component were also used. Results revealed that nearly three fourth of the respondents demonstrated relatively lower scores for all components: innovativeness, farm decision making, achievement motivation, farmer entrepreneurship, risk taking ability, planning ability, leadership ability and cosmo-politeness. The highest EBI was found in achievement motivation whilst the lowest in risk taking ability. Findings propose need for suitable strategies to enhance the entrepreneurship capacity of farmer-entrepreneurs in the industry.

Key Words: Alternative income, Agribusiness, Entrepreneurial behaviour index, Mushroom industry, Rural economy, Value addition

1. Introduction

Contrary to the traditional view on agriculture as a less attractive and innovative venture with limited dynamics, the growing demand for diverse agro-products around the globe has recently changed the course of agriculture drastically. This inspired both farming and non-farming communities to transform themselves into agri-entrepreneurs, thereby initiate a variety of agribusinesses. Hence, agriculture has now become one of the most potent sources of the rural economy, food security, economic growth and development (Kulasinghe & Sandika, 2010). The number of entrepreneurs determines the success of each society and economy in any country. Therefore, many developed and developing countries focus on supporting entrepreneurship (Naude *et al.*, 2011). Entrepreneurship is the activity of setting up a business or businesses and taking on calculated financial risks in the hope of profit. The concept of entrepreneurship is not limited to certain areas or fields but has numerous dimensions (Rusu *et al.*, 2012). Over the years, the agribusiness system has evolved from individual markets to more complex chains and networks. The role of entrepreneurship plays a vital role in the modern agribusiness system (Zylbersztajn, 2017).

Farm-entrepreneurship is important to expedite poverty alleviation and rural development in developing countries. Expansion of agribusiness systems within an economy opens up novel ways to earn and sustain income; hence, this has been further boosted by entrepreneurship. However, most of the farmers in developing nations do not have a steady alternative income generation source and are thus easily susceptible to financial risk. Lack of opportunities in income generation drags small-scale farmers into the vicious cycle of poverty. Sri Lanka is gradually losing its momentum in the agriculture sector compared to its other South Asian counterparts (Naude *et al.*, 2011). These issues have serious consequences not only in terms of the sector's development but also of national food security. Lack of entrepreneurship opportunities in the sector drives the new generation away from agriculture. This is where the stimulus of farm-entrepreneurship is essential for developing countries like Sri Lanka. Proper entrepreneurial skills may aid these farmers in connecting with emerging agribusiness opportunities in national and global value chains, creating a window of opportunity for the Sri Lankan agriculture sector.

Global mushroom production has steadily increased from 0.3 million tons to 3.4 million tons from 1965 to 2015 (Manjit *et al.*, 2017). World leading mushroom producing countries are China, United States, Netherlands, Poland and Spain. Among those countries, China itself produces nearly 70% of the total production

(FAOSTAT, 2020). In India, mushroom soup powder, biscuits, nuggets, ketch-up, candy, pickle, chips and ready-to-serve mushroom curry are popular agribusiness ventures initiated under farm-entrepreneurship (Wakchaure, 2017). It is reported that market structure of mushroom in many South Asian countries is unsystematic (Jahan & Singh, 2019). Mushroom cultivation is an ideal and attractive venture among rural and even semi-urban farming communities. It is considered a profitable agribusiness venture in many developing countries as an excellent source of protein and energy and help reduce malnutrition, an alternative solution for unemployment and job creation, less usage of high-capital intensive machinery for primary production, a window of opportunities for various levels of value additions, limited land requirements for the cultivation and minimizing the climatic risk in agriculture (Jahan & Singh, 2019; Gamage & Ohga, 2018; Wakchaure, 2017).

Even though commercial level mushroom cultivation in Sri Lanka was initiated in 1985, the industry in Sri Lanka is still growing with only a few value-added products available in the market. At present, mushrooming is a cottage industry and has the potential to grow into a much larger industry (Gamage & Ohga, 2018; Thilakarathne et al., 2018; Wijeratne & De Silva, 2014). Due to various issues related to production and sales, a declining trend of farmers engaging in mushroom cultivation is observed (Thilakaratna & Pathirana, 2018). It is evident from the facts: 47% of the people engaged in mushroom cultivation in 2017 abandoned it by 2018. The main reason was the lack of entrepreneurial and managerial skills of the mushroom entrepreneurs in Sri Lanka (Gnaneswaran & Wijegunasekara, 1999). Other than that, a lack of knowledge in mushroom cultivation and disease management, limited financial assistance, technological barriers, difficulties in finding a proper local market and difficulties in producing value-added mushroom products have also contributed to this state of affairs (Gamage & Ohga, 2018; Thilakaratna & Pathirana, 2018). The overarching aim of the study is to investigate the current state of the mushroom industry in Sri Lanka and to evaluate the entrepreneurial behaviour exhibited by mushroom farmers. Additionally, the study endeavors to proffer viable strategies aimed at augmenting the entrepreneurial capacity of individuals engaged in farming mushrooms. This research contributes to the intersection of agribusiness and entrepreneurship by examining the specific case of the mushroom industry in Sri Lanka.

To establish a solid foundation for the study, an extensive literature review was undertaken, providing a comprehensive overview to substantiate the conceptual framework. The methodology section elucidates the research design, encompassing details such as the study location, sample selection, data collection tools, and the

chosen approach for data analysis. A meticulous examination of both primary and secondary data is expounded upon in the results and discussion section. The culmination of the research effort is encapsulated in the presentation of key findings and the subsequent formulation of recommendations. By addressing the intricacies of the mushroom industry in Sri Lanka and delving into the entrepreneurial dynamics at play, this paper aims to offer valuable insights that can inform future actions in the realm of agribusiness and entrepreneurship.

2. Literature review

Hisrich and Peters (1989) defined entrepreneurship as *"the process of creating something different, with value, by allotting the necessary time and effort, presupposing the taking of financial, social and physical risk, and obtaining monetary rewards and personal satisfaction"* (p.192). The entrepreneur is an agent who engages in such processes. Another, simpler version is that entrepreneurship is concerned with why, when and how individuals identify and exploit opportunities (Shane & Venkataraman, 2000). Throughout history, the ways and means of entrepreneurial thinking have evolved with unpredictable twists and developments. Entrepreneurship mainly depends on opportunity seeking and the degree of risk taking (Rusu et al., 2012). Entrepreneurship also involves an economic function, as a bearer of uncertainty, a distributor of resources, or an innovator. It also refers to inherent characteristics, the creation of new organizations, or the role of an owner or manager (Karlsson et al., 2004). Farm-entrepreneurship can be divided into two parts: on-farm diversification (activities as part of the existing farm) and off-farm diversification (new business ventures outside regular farming). It is not only large-scale farmers but also small-scale farmers who can become entrepreneurs (Karlsson et al., 2004). Even though the majority of farmers tend to practice on-farm diversification, off-farm diversification is also profitable, as long as farmers possess the qualities of innovativeness and are forward-looking. Farmers need have the potential to identify opportunities and seize them. In the realm of agricultural entrepreneurship, it is acknowledged by farmer-entrepreneurs that novel opportunities manifest within the market, and it is within this market space that profits are realized. Consequently, the decision-making process regarding farm production is underscored by the imperative to align with market demands rather than being solely influenced by subjective farmer perspectives. This recognition highlights the significance of market-oriented considerations in shaping strategic decisions within the agricultural sector (Karlsson et al., 2004).

Behaviour is the way in which one acts or conducts or responses oneself, especially towards something or someone (Uher, 2016). However, entrepreneurial behaviour of farm management is termed as the changes in knowledge, skills and attitudes of farmers towards farming and allied activities. It is not confined to doing new things but also doing things in a new way that have already been done, but with different results (Anthony *et al.*, 2014). Entrepreneurial behaviour can be measured in many ways. Most popular method is to use a mix of qualitative factors which are attributed with entrepreneurship (Chitsa, 2014). Planning ability, embracing risk, leadership or management ability, cosmo-politeness, knowledge on farming and allied activities, ability to implement decisions, farm innovativeness, achievement and market orientations are some factors which determine farm-entrepreneurship (Wanole *et al.*, 2018; Bhendarkar *et al.*, 2017; Chitsa, 2014). Degree of these attributes construct the farmer-entrepreneur. These factors may vary from person to person and even industry to industry in many cases.

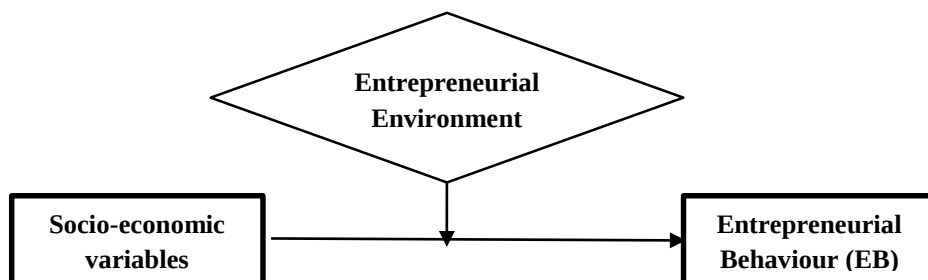
Past studies have identified many socio-economic factors which affect entrepreneurial behaviour (Bhendarkar *et al.*, 2017; Chitsa, 2014; Archana, 2013). Studies have shown that various factors such as age, gender, education, land holding, annual income, farming experience, participation in extension and economic motivation influence entrepreneurial behaviour. Gender is a base to assign certain roles and behaviour to men and women in the society. Gender also affects the decision making power in farming activities. Household head's gender is therefore significant in accessing resources and success in farming. Age is another factor that determines the degree of entrepreneurship in farming. It is evident that younger farmers quit farming since technically oriented and are attracted to other industrial activities. However, on the other hand older farmers possess hands-on experience related to farming thus creating tacit knowledge which is hard to transfer. Better human capital resources play a significant role in entrepreneurship thus, education and training is much needed to enhance entrepreneurial behaviour. Availability of own land for farming reduces the risk hence, farmers tend to experiment more. Household income and the number of income sources are other crucial factors which enhance entrepreneurial capacity in farm management. Factors such as family size and more importantly the number of dependents within the family determine the household economy, thus, those affect in different ways. In some cases, family labor greatly aids farming. If farmers possess self-processing capability it boosts novel products and processes.

Not only the micro level factors but macro level factors also have an effect on the entrepreneurial capabilities (Kahan, 2012). In general, these factors are termed as the entrepreneurial environment which is beyond the control of farmers. Favorable policies enhance production and processing capabilities. Policy frameworks need to focus more on research and development and infrastructure development rather than imposing measures to control free flow markets (Wankhade et al., 2013). Simultaneously it may aid in the emergence and development of market structures in a country. Farmers could seek more opportunities by having access to wider business networks in both public and private sectors. Technological advancement may increase the efficiency and effectiveness of farm management thus, creating a window of opportunities in farm-entrepreneurship development.

3. Methodology

A descriptive survey design that blends quantitative and qualitative data to unveil in-depth knowledge on a phenomenon was used (Mouton, 1996) and it serves best in answering the questions and the purposes of the study. Selected socio-economic variables are identified as independent variables which affect the dependent variable; entrepreneurial behaviour. Further, entrepreneurial environment is considered as the moderating variable which affect the relationship between socio-economic variables and entrepreneurial behaviour (Figure 1).

Figure 1: Conceptual framework of the study



Source: Prepared by Authors

Entrepreneurial behaviour is derived as a function of eight components through an extensive literature review. These eight components are considered as the essence to capture entrepreneurial behaviour of farm-entrepreneurship. It is important to understand not only one but all eight components contribute to the behaviour of the entrepreneur. Innovativeness is a personal creativeness displayed by the farmer through trying of new farming techniques and making improvements to existing farming methods. Farm decision making is the ability of farmer to select and execute

the most efficient decision among a set of alternatives independently. Social value that emphasizes a desire for the excellence in order for an individual to attain a sense of personal accomplishment is the achievement motivation. The level at which the farmer has mastered the necessary information and skills required for the profitable operation of the farming enterprise is considered as the knowledge of farming enterprise. The degree to which the farmer is oriented to embrace uncertainty in farming activities is called risk taking ability of the farmer. Planning ability is the way that the farmer carves future direction of the farming venture by allocating sufficient resources to achieve goals and objectives of the venture. The degree to which an individual initiates and motives action of others is the leadership ability. The degree to which the farmer is oriented outside his community and making diversity in what he does is termed as cosmo-politeness. In the literature review, the study considered age, gender, education level, occupation type and monthly annual household income as vital socio-economic indicators. Broad and dynamic surrounding which farmer entrepreneur works within is identified as the entrepreneurial environment. Therefore, farmer entrepreneur behaviour is moderated by these broad aspects which are beyond farmer's control. The main aspect is the government policy framework to support farmer-entrepreneur. This includes different policy setups which link many private and public institutes and its activities. Infrastructure and resource availability are also added to that. Further, market structures and its development over time is another aspect. Research and development acts as another environmental catalyst in farm-entrepreneurship.

In general, mushroom growers are scattered around the island. However, the study focused on Ratnapura, Kalutara, Colombo, Kurunegala, Kegalle and Kandy districts, from August to December 2022. These areas make a significant contribution towards the mushroom industry in Sri Lanka. Hence, these are identified as the mushroom pocket in Sri Lanka. Furthermore, developing and potential markets have been identified in these areas (Gamage & Ohga, 2018; Thilakaratna & Pathirana, 2018; Thilakarathne et al., 2018). In addition, selection of these areas was verified through the initial discussions conducted with the Department of Agriculture. Multi-stage random sampling was used in the study. The sample of the study was a group of small and medium scale mushroom farmers (elements) drawn from an accessible population. Mushroom cultivating farm household was considered as the basic unit for data collection considering the economic situation of society. Farm household is defined as one person living alone or a small group of persons who share the same living accommodation, who pool some or all of their income and wealth and who consume certain types of goods and services collectively, mainly housing and food

(Chitsa, 2014). The respondents were selected randomly using a list of mushroom farm households maintained by relevant institutes (government and private) which promote and develop mushroom cultivation in the selected districts.

Accordingly, the size of the sampling frame was 2890 (lists were obtained from respective Agriculture Services Centers) and 10% of this was selected as the sample ($n=289$) of the study by considering the time available and the budget. The margin of error and confidence level were used as 5.76% and 95% respectively. This means, in this case, there is a 95% chance that the real value is within $\pm 5.76\%$ of the measured/surveyed value. In addition, purposive sampling was also adopted to select key informants for the study in order to ensure information richness. This facilitated the incorporation of diverse settings, scenarios, and participants, encompassing instances that were unfavorable or exceptional, to acquire comprehensive and varied data (Moser & Korstjens, 2017). Accordingly, 289 respondents were selected for the survey. A total of 51 key persons including farmer organizations, societies and cooperative, collectors/assemblers and processors, Regional Agricultural Research and Development Centre-Makandura, Ratmalana Mushroom Development and Training Centre, Sri Lanka Export Development Board-Colombo, Non-Governmental Organizations (NGOs) related to the promotion of mushroom cultivation and processing (SAEMAUL), other technical/training institutes related to mushroom cultivation and processing 'Peoples Livelihood Development Foundation (PLDF)' Institute were interviewed.

Both primary and secondary data was gathered for the study. Primary data was generated through pre-tested structured questionnaire survey, KII, FGDs and case study analysis. The questionnaire consisted of two parts: demographics aspects and 32 questions/Likert items (five point) relevant to the eight components, ranging from "strongly disagree" (SD), through "disagree" (D), "Neutral" (N), "Agree" (A) to "strongly agree" (SA). Secondary data was gathered through secondary data sources such as relevant national and international journal articles, newspapers, periodicals, reports (i.e. Department of Agriculture, Department of Census and Statistics, Central Bank of Sri Lanka) and any other reliable and related documents.

Reliability test was carried out to assess the internal consistency of the Likert-scale questions. Accordingly, every four items resulted in a good Cronbach's alpha coefficient (over 0.8) ensuring the internal consistency. Entrepreneurial Behaviour Index (EBI) was derived through eight components. Level of entrepreneurship for each component (using mean and SD) and overall entrepreneurial behaviour was calculated using the following formula (Chitsa, 2014):

$$EBI = \frac{\sum_{n=1}^8 \frac{Tn}{Mn} \times Rcn}{\sum_{n=1}^8 Rcn} \times 100$$

Where, Tn = Total obtained score of the component “n”

Mn = Maximum obtainable score of the component “n”

Rcn = Scale value of the component “n”

n = Number of components

Further, respondents were categorized as low in entrepreneurial behaviour and high in entrepreneurial behaviour. This was done using the mean score of satisfaction level of each component and overall mean score of satisfaction level of entrepreneurial behaviour. If the mean score of satisfaction level is on or below the 3.40, then entrepreneurial behaviour can be considered as low and if the mean score of satisfaction level is above 3.40, then entrepreneurial behaviour can be considered as high. The level of satisfaction is considered from score of the answers and was divided into five levels. Table 1 illustrates the criteria for understanding the mean of satisfaction level. This procedure has been adopted from the past similar studies conducted to measure the entrepreneurial behaviour (Chitsa, 2014; Wankhade et al., 2013). A standard and previously practiced questionnaire scale was also adopted to maintain uniformity. If the mean score of satisfaction level is on or below the 3.40, then entrepreneurial behaviour is considered as low and if the mean score of satisfaction level is above the 3.40, then entrepreneurial behaviour is considered as high (Chitsa, 2014; Wankhade *et al.*, 2013).

Mean Scores of satisfaction level= (Higher score-lower score)/ number of levels

Table 1: The criteria for understanding the mean Scores of satisfaction levels

Mean Score	Level of Satisfaction
1.00-1.80	Very unsatisfactory
1.81-2.60	Unsatisfactory
2.61-3.40	Moderately satisfactory
3.41-4.20	Satisfactory
4.21-5.00	Very satisfactory

Source: Chitsa, 2014; Wankhade *et al.*, 2013

4. Results and discussion

Notably, the majority of respondents were females (57.4%). Hence, the mushroom industry has been considered as one of the major agribusiness ventures which empowered rural as well as urban women farmers. Further, the study revealed that the main decisions related to cultivation have been taken by women farmers. Moreover, women farmers were equipped with less extrovert characteristics than male farmers as reported through interviews. In most cases, a high level of entrepreneurial behaviour was demonstrated by male farmers, and this has been noted in Colombo, Kegalle and Kandy. Overall, more than two thirds (73.4%) of the sample demonstrated a low level of entrepreneurial behaviour. Most of the respondents (51.2%) were in the age category of 31 - 45 years. This shows that mushroom cultivation is popular among the younger generation. Further, the second highest representation (32.5%) was from the age category of 46 to 60 years. Interestingly, few respondents (10.4%) represented the age category which is below 30 years. Majority of the respondents of all three age categories: lowest through 30 years, 31 years through 45 years and 46 years through 60 years were low in entrepreneurial behaviour (Appendix 1).

Respondents of the survey represented a variety of educational levels. Majority had passed the Advanced Level and hence, had a fair educational background. Even with this educational background still more than two thirds of the sample demonstrated low level of entrepreneurial behaviour. Most of the respondents (54.3%) were self-employed. Anyhow, the highest entrepreneurial behaviour within the primary occupation of the respondents was shown by the respondents (92.0%) who are employed in the government sector (qualitative data of the study elaborated that they had acquired standard awareness programs prior to running the business) followed by the persons making agriculture-related careers except for mushroom cultivation (25.4%). The percentage of this for self-employed persons was only 16.6%. Primary intention of farming represents the intended orientation of the farmer or household towards farming and related allied activities. It is evident that, majority (71.3%) had the primary intentions of farming exclusively for home consumption and farming primarily for home consumption with a certain marketing surplus. Hence, their overall entrepreneurial orientation was very low. Further, overall entrepreneurial behaviour was also low. The highest (42.9%) number of respondents had an average monthly household income of LKR 50,001 to 65,000 and the second highest (36.0%) category represented average monthly household income of LKR 35,001 to 50,000. However, higher income earners had higher entrepreneurial behaviour than lower categories.

Table 2 represents the level of entrepreneurial behaviour of respondents in the survey. Interestingly, nearly three fourth of the respondents demonstrated relatively lower scores for all components (innovativeness, farm decision making, achievement motivation, knowledge of farming enterprise, risk taking ability, planning ability, leadership ability and cosmo-politeness) of the entrepreneurial behaviour as per the cutoff marks allocated for each component. Here the EBI is a number on the basis of which the respondents can be said to have more or less entrepreneurial attributes by virtue of their chance of success in the industry. Accordingly, the highest EBI was found in achievement motivation and the lowest in risk taking ability. Further, both innovativeness and leadership abilities also ranked low. When considering the innovativeness component, most farmers tended to retain only one mushroom variety and had no intention of cultivating any other variety since farmers were not aware of the performance of other varieties. Farmers relied only on the performances of a selected variety and cultivated it for a longer period with a standard set of cultural, social and economic practices. Most of the farmers obtained regular information and updates on production, financial and market data for that particular variety (especially for American Oyster). Only few have tried new varieties during several cultivation cycles. As a result of limited support from extension services most farmers are reluctant to try new varieties.

Table 2: Level of entrepreneurial behaviour of respondents

Component	Level of Entrepreneurship Behaviour				EBI	Rank
	High (if, >3.4)		Low (if, <3.4)			
	Freq.	%	Freq.	%		
Innovativeness (Mean = 3.090; SD = 0.565)	73	25.3	216	74.7	61.8	7
Farm decision making (Mean = 3.114; SD = 0.665)	76	26.3	213	73.7	62.2	5
Achievement motivation (Mean = 3.164; SD = 0.6898)	77	26.6	212	73.4	63.2	1
Knowledge of farming enterprise (Mean = 3.146; SD = 0.685)	77	26.6	212	73.4	62.9	2
Risk taking ability (Mean = 3.066; SD = 0.725)	74	25.6	215	74.4	61.3	8
Planning ability (Mean = 3.115; SD = 0.664)	77	26.6	212	73.4	62.3	4
Leadership ability (Mean = 3.106; SD = 0.735)	77	26.6	212	73.4	62.1	6
Cosmo-politeness (Mean = 3.128; SD = 0.683)	77	26.6	212	73.4	62.5	3
Overall entrepreneurial behaviour (Mean = 3.116; SD = 0.636)	77	26.6	212	73.4	62.3	-

Source: Field Survey, 2022

Farmers of a particular area have managed to build a network among their neighboring farmers to a certain extent and were able to share relevant information (market channels, production techniques and disease control methods). Hence, mushroom cultivation could be considered as a social entrepreneurship venture as well. However, these farmers have links only with the farmers and producers within their operational area. Further, these farmers knew the quantities and varieties grown by their neighboring farmers to a certain extent. Interestingly, farmers gained access to popular and established market channels in the area. Mostly harvest was marketed in the raw form and the buyer, seller operations were based on the trust of each party. The only limiting factor was lack of information on novel and improved cultivation techniques in order to execute changes to cultivation. That was one of the major setbacks which hindered entrepreneurial operations.

Referring to the achievement motivation, these farmers considered mushroom cultivation as a secondary occupation or an alternative income source and this is why farmers did not want to try out different varieties. Further, discontinued farming practices were observed for mushroom cultivation. Hence, priority was not given to the mushroom cultivation and intention was to have an alternative income source for the household to cover additional expenses such as medical, educational, housing and rotating savings (a type of microfinance technique). This is one of the major reasons why respondents did not expand their mushroom cultivation as an entrepreneurial venture. Simultaneously, respondents spent much less time on the cultivation compared to primary agricultural and non-agricultural activities. However, expected yield from the cultivation was satisfactory according to respondents compared to the time they allocated for cultivation. A very few had an intention to expand their mushroom cultivation in the near future knowing the prospects of the industry.

Respondents were aware of the operational cost (growbags/pots, growing media, spawn, supplements and other minor miscellaneous items) and revenue (setting base price per packet) components of the mushroom cultivation. However, accuracy of income and expenditure forecasts is therefore not reliable. Respondents had a fair and basic knowledge on materials which were used for the cultivation. However, in most cases some of the critical practices such as selection of growing media, purchasing of quality spawn and maintenance of hygiene within the growth house were neglected. This had an adverse impact on quality and the quantity of the final output. Respondents were not updated regarding those practices and had limited access to such information. Therefore, overall understanding about the cultivation was low. Respondents rarely adopted new planting techniques and methods as mentioned earlier. A majority intended to retain similar practices that they adopted over a period

of time. Similarly, the majority did not have any intention to invest in expanding their production. However, respondents expected to increase production through enhancement of productivity (basically with less usage of input over output). Further, respondents did not want to invest in improved technology. Only a few farmers who had attempted were willing to try entirely different mushroom varieties. Hence, the value addition process was at a very lower level among these farming communities. Overall respondents were not willing to take any form of risk (economic, social and cultural) and could be considered risk averse and reluctant to adopt novel ways of practices and in the process of value addition.

Respondents did not undergo any prior planning stage before initiating their cultivation. In addition, there were no risk management strategies as well. For example, if a particular farmer lost his major market channel it may significantly affect that farmer. This had an impact on the farmer which may lead him to exit from the cultivation. Another reason for this is the relative ease of entering and leaving the industry compared to other open field cultivations. Simply, farmers did not have either short- or long-term ideas on how to execute the business. That drastically deteriorates the entrepreneurial behaviour of the considered farming communities. Sourcing and deploying of capital for the cultivation oriented more towards ad-hoc manner. Most of the time informal credit sources were used and invested for cultivation. Notably, of formal credit lines microfinance played a dominant role. Farmers less frequently gathered industry updates and mostly confined to community level knowledge. This is a major reason why the industry is not progressing among those communities.

Respondents had well accumulated tacit knowledge on mushroom cultivation over the years. However, there was no proper mechanism to transfer such knowledge especially to the beginners. Some of the respondents were identified as leading farmers who are rich in every component of the EBI related to mushroom cultivation during the interview process. However, there was no proper official mechanism to recognize and disseminate their knowledge among other communities. Mushroom cultivation is identified as a family venture in most cases and hence, almost all family members in the household had a particular role (from source of inputs to market of the final product) in the cultivation. Notably, there were no gender or age restrictions in cultivation. Mushroom cultivation could therefore be identified as a venture that empowers all categories in a society. That is why mushroom cultivation is ideal to be promoted among the rural and poverty stricken communities in developing countries. Leading farmers are engaged in the knowledge sharing process informally to a certain degree. However, the scope was very limited and made a trivial contribution as a

whole. These leading farmers could be imperative to promote the industry. Simultaneously, leading farmers are also required to be updated on novel production schemes and varieties in order to reap the maximum benefit from the industry.

Respondents have rarely connected with other distance farming communities and had no idea regarding the varieties, quantities and market channels of those areas. Occasionally, respondents have participated in different types of seminars, workshops and exhibitions related to agriculture and not specifically related to mushroom cultivation. However, respondents had an intention to gather new information related to the cultivation. Fifty-six percent of the respondents have participated in training programs related to mushroom cultivation prior to starting the cultivation. It is noted that, both private and public entities have arranged training programs from time to time. The percentages of trained respondents in value-added products, seed/spawn production, disease and pest control in mushroom cultivation, and mushroom marketing are about 35%, 3.5%, 3.5%, and 2% respectively.

Accordingly, the majority of trained farmers (around 99%) were satisfied with the content of the training. The main limitation of those programs was lack of knowledge sharing on value addition techniques. Hence, in most cases respondents considered those training programs as repetitive sessions which were only concerned with production aspects. This is also one of the reasons for the slow progression of the industry in Sri Lanka. More than half of the respondents requested to conduct formal awareness programs related to value addition processes, seed/spawn production, disease and pest control, and marketing aspects in the industry in order to operate it as a viable business venture. Also, the respondents lack knowledge regarding the total demand and supply of the local mushroom industry and the study identified that there were no official databases to extract such information for the general public. This limits the entrepreneurial capacities of new entrants to the industry.

Among the mushroom growers in Sri Lanka, Ratnapura and Kegalle have a high number of growers. Mushroom cultivation societies areas are remarkable entities that many people are associated with. These societies were located in Ginidamana, Eheliyagoda and Kuruwita in the Ratnapura district; Dibbedda in Kalutara district and Pitiyagama and Hewadiwela in Kegalle district. Although Mushroom Society is a combination of public and private sectors, the private sector is more active and has more ownership and power. It is notable that the private sector is adopting low-cost, profit-oriented business and strategic methods and presenting itself as a service provider to meet the needs of the growers. It is remarkable that they provide training services to mushroom growers and provide raw materials to meet basic needs as well

as technical support. It was seen that they provided basic inputs such as seeds, nets, sealers, and boilers needed for sterilizing the mushroom grow bags.

When considering the constraints in the mushroom industry, problems related to pests and diseases top the list. This study revealed that the main reason for disease incidence is lack of standard crop houses and the absence of proper training in mushroom cultivation. Here, absence of advanced training is a major limitation of the mushroom industry. Lack of knowledge to combat pest incidence leads to crop loss and in turn, forces the farmer to abandon the industry. This clearly shows that even though government institutions like the Department of Agriculture, Vidatha Resources Center, Ratmalana Mushroom Development and Training Center, as well as the private sector, have made some interventions regarding mushroom cultivation. However, those were not sufficient to solve many of the problems associated with mushroom cultivation. The study revealed that higher margins were drawn by intermediaries. A significant number of growers expressed doubts over the quality of the wood powder available in the market and lack of alternatives, especially for rubber wood powder, for mushrooms. The high input prices discourage and distance the growers from the industry.

5. Conclusion

The purpose of the study is to explore the present status of the mushroom industry in Sri Lanka and assess the entrepreneurial behaviour of mushroom farmers. Further, the study attempts to propose suitable strategies to enhance entrepreneurship capacity of farmer-entrepreneurs in the industry. Most importantly the study revealed that the majority of the respondents demonstrated relatively lower scores for all eight components that derived entrepreneurial behaviour. Respondents were very much stagnated and resist change. Proper planning was hardly evident among the respondents. Respondents still identified mushroom cultivation as a means of secondary income source. Respondents' intention to develop the sector is not favoured as a result of improper management practices in the industry. In most cases, some of the critical practices such as the selection of growing media, purchasing of quality spawn and maintenance of hygiene within the growth house were neglected. Accuracy of the financial forecast was, therefore, is debatable. During the site visits and observations, it was reported that the respondents relied on limited market channels. They were not properly linked with the value-added industry as well not exposed to novel production processes. Even though the tacit knowledge of the respondents was good; an effective knowledge transfer mechanism was not visible. There should be a proper mechanism to identify champion farmers to strengthen the

industry. Further, systematic training on planning, risk training and marketing should be provided to selected farming communities to uplift the industry. Most importantly, these communities should be linked well with the value-added industry to reap the maximum benefit.

Acknowledgements: We wish to thank two anonymous reviewers and the editorial board for constructive criticism on the earlier drafts. Further, we acknowledge all the respondents and key informants for taking part in the survey process actively.

List of references

- Anthony, O. I., Ifeanyi N, N., Ogbonnaya, O. U., & Maria E., N. (2014). Analysis of entrepreneurial behaviour among cassava farmers in Ebonyi State, Nigeria. *International Journal of Agricultural Science, Research and Technology in Extension and Education Systems*, 4(2), 69-74.
- Archana, K. N., & Natikar, K. V. (2013). A Study on entrepreneurial behaviour of commercial seed growers of Dharwad district. *Karnataka Journal of Agriculture Science*, 26(3), 121-134.
- Bhendarkar, M. P., Gajbhiye, A. M., Chaudhari, K. J., & Laxmi, R. R. (2017). An assessment of entrepreneurship behaviour of fisherwomen in the Ratnagiri block of Ratnagiri District, Maharashtra State, India. *Asian Journal of Agricultural Extension, Economics & Sociology*, 17(3), 1-8.
- Chitsa, G. (2014). *Analysis of entrepreneurial behaviour of smallholder irrigation farmers: Empirical evidence from Qamata irrigation scheme*. [Doctoral dissertation, Singapore University of Social Sciences].
- FAOSTAT. (2020, January 10). <http://www.fao.org/faostat/en/-data/QC>.
- Gamage, S., & Ohga, S. (2018). A comparative study of technological impact on mushroom industry in Sri Lanka: A review. *Advances in Microbiology*, 8(8), 665-686.
- Gnaneswaran, R., & Wijayagunasekara, H. N. P. (1999). Survey and identification of insect pests of oyster mushroom (*Pleurotus ostreatus*) cultures in central province of Sri Lanka.
- Hisrich, R. D., & Peters, M. P. (1989). *Entrepreneurship: Starting, Developing, and Managing a New Enterprise*, Homewood, IL: BPI, IrwinMcGraw-Hill.
- Jahan, A. F. I. F. A., & Singh, B. K. (2019). Mushroom value chain and role of value addition. *International Journal of Business Research* 9(1), 5-14.
- Kahan, D. (2012). *Entrepreneurship in farming*. Food and Agriculture Organization of the United Nations.

- Karlsson, C., Friis, C., & Paulsson, T. (2004). *Relating entrepreneurship to economic growth. The Emerging Digital Economy: Entrepreneurship Clusters and Policy*. Springer-Verlag, Berlin.
- Kulasinghe, G. A. R., & Sandika, A. L. (2010). *Analysis of entrepreneurial characteristics of vegetable farmers in Matara District*. Institute of Policy Studies.
- Manjit, S., Shwet, K., & Sharma, V. P. (2017). Status and trends in world mushroom production-I. *Mushroom Research*, 26(1), 1-20.
- Moser, A., & Korstjens, I. (2018). Series: Practical guidance to qualitative research. Part 3: Sampling, data collection and analysis. *European journal of general practice*, 24(1), 9-18.
- Mouton, J. (1996). *Understanding social research*. Van Schaik Publishers.
- Naude, W., Szirmai, A., & Goedhuys, M. (2011). *Innovation and entrepreneurship in developing countries*. UNU.
- Rusu, S., Isac, F., Cureteanu, R., & Csorba, L. (2012). Entrepreneurship and entrepreneur: A review of literature concepts. *African Journal of Business Management*, 6(10), 3570.
- Shane, S., & Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of Management Review*, 25(1), 217-226.
- Thilakarathne, S., Sivashankar, P., Matandare, M. A., Matandare, T. O., & Kokera, L. K. (2018). Mushroom value chain analysis in Kegalle District of Sri Lanka. *Amity Journal of Agribusiness*, 3, 1-19.
- Thilakarathna, W. S., & Pathirana, P. B. M. (2018). *Prospects and challenges of mushroom production in Kuruwita, Sri Lanka: comparative report on two consecutive years*.
- Uher, J. (2016). What is behaviour? And (when) is language behaviour? A metatheoretical definition. *Journal for the Theory of Social Behaviour*, 46(4), 475-501.
- Wakchaure, G. C. (2017). Mushrooms-value added products. *Manjit Singh, Bhaunesh Vijay, Shwet Kamal et al., Mushrooms-cultivation, marketing and consumption, Directorate of Mushroom Research, Solan, Himachal Pradesh-173213, India*, 233-238.
- Wankhade, R. P., Sagane, M. A., & Mankar, D. M. (2013). Entrepreneurial behaviour of vegetable growers. *Agricultural Science Digest-A Research Journal*, 33(2), 85-91.

- Wanole, S. N., Bande, K. D., Holkar, S. C., & Mardane, R. G. (2018). Relational analysis of entrepreneurial behaviour of banana growers. *International Jr. of Chemical Studies*, 6(3), 2407-2411.
- Wijeratne, M., & Silva, N. D. (2014). Mobile phone intervention for Sri Lankan mushroom producers. *Asian Association of Open Universities Journal*, 9(1), 57-63.
- Zylbersztajn, D. (2017). Agribusiness systems analysis: origin, evolution, and research perspectives. *Revista de Administração (São Paulo)*, 52, 114-117.

Appendix 1: Demographic information with the entrepreneurial behaviour

Demographic Character		Low in Entrepreneurial Behaviour	High in Entrepreneurial Behaviour	Total
Gender	Male	80 (65.0%)	43 (35.0%)	123 (42.6%)
	Female	132 (79.5%)	34 (20.5%)	166 (57.4%)
Age	< 30 years	22 (73.3%)	8 (26.7%)	30 (10.4%)
	31 to 45 years	120 (81.1%)	28 (18.9%)	148 (51.2%)
	46 to 60 years	63 (67.0%)	31 (33.0%)	94 (32.5%)
	61<	7 (41.2%)	10 (58.8%)	17 (5.9%)
Education Level	Grade 1-5	1 (100.0%)	0 (0.0%)	1 (0.3%)
	Grade 6-11	6 (54.5%)	5 (45.5%)	11 (3.8%)
	Sat for O/L	66 (84.6%)	12 (15.4%)	78 (27.0%)
	Passed O/L	33 (62.3%)	20 (37.7%)	53 (18.3%)
	Sat for A/L	35 (87.5%)	5 (12.5%)	40 (13.8%)
	Passed A/L	59 (72.0%)	23 (28.0%)	82 (28.4%)
	NVQ	2 (100.0%)	0 (0.0%)	2 (0.7%)
	Diploma	1 (33.3%)	2 (66.7%)	3 (1.0%)
	Undergrad. / Grad.	8 (50.0%)	8 (50.0%)	16 (5.5%)
	Any other higher	1 (33.3%)	2 (66.7%)	3 (1.0%)
Primary Occupation	Agriculture related	44 (74.6%)	15 (25.4%)	59 (20.4%)
	Self-employed	131 (83.4%)	26 (16.6%)	157 (54.3%)
	Private sector	20 (87.0%)	3 (13.0%)	23 (8.0%)
	Government sector	2 (8.0%)	23 (92.0%)	25 (8.7%)
	Semi-government sector	0 (0.0%)	2 (100.0%)	2 (0.7%)
	Casual labor	14 (77.8%)	4 (22.2%)	18 (6.2%)
	Retired	1 (20.0%)	4 (80.0%)	5 (1.7%)
Primary Intention of Farming	Farming exclusively for home consumption	92 (94.8%)	5 (5.2%)	97 (33.6%)
	Farming primarily for home consumption marketing surplus	102 (93.6%)	7 (6.4%)	109 (37.7%)
	Farming primarily for the market with some home consumption	16 (33.3%)	32 (66.7%)	48 (16.6%)
	Farming exclusively for the market	2 (5.7%)	33 (94.3%)	35 (12.1%)
Monthly Household Income (LKR)	Lowest - 35000	4 (100.0%)	0 (0.0%)	4 (1.4%)
	35001 - 50000	103 (99.0%)	1 (1.0%)	104 (36.0%)
	50001 - 65000	90 (72.6%)	34 (27.4%)	124 (42.9%)
	65001 - 80000	14 (25.9%)	40 (74.1%)	54 (18.7%)
	80001 - Highest	1 (33.3%)	2 (66.7%)	3 (1.0%)

Source: Field Survey, 2022.

