Introduction

Mushroom has great potential as a source of nutrition, an economical and a climate-resilient crop that can promote farm-entrepreneurship through value-addition. However, a robust action plan is lacking in converting the crop into a diversified agribusiness venture among producers and processors. Hence the study aims at suggesting viable policy strategies to enhance the entrepreneurship capacity of mushroom farmer-entrepreneurs, thereby reinforcing income generation and food security in Sri Lanka. The foci of the study were: identifying the factors that affect the entrepreneurial behaviour of farmer entrepreneurs, constructing an entrepreneurial behaviour profile of farmer-entrepreneurs, assessing the product distribution, income and expenditure of mushroom cultivation and exploring current and emerging agribusiness opportunities in the value addition process to enhance entrepreneurship capacity of farmer-entrepreneurs.

Analysis

The study employed a descriptive survey design that blends quantitative and qualitative data. The study was conducted in two phases from August to December 2021 in Ratnapura, Kalutara, Colombo, Kurunegala, Kegalle and Kandy districts. In the face of the Covid 19 pandemic, questionnaires were used to elicit information from 374 mushroom cultivating farmers via telephone and social media. Later, another sub-sample of 100 interviewees was interviewed in in-person in the second phase. Both non-probability and probability sampling techniques — snowball sampling and multi-stage random sampling— were adopted to select farm households for the study. Also, key informant interviews and focus group discussions were conducted to evaluate the possible path forward. Both primary and secondary data were analyzed using descriptive and inferential statistics.

Entrepreneurial Behaviour of Farmers

A majority of the farmers cultivate American Oyster followed by Abalone and Bhutan Oyster. The main decisions related to cultivation are taken by women farmers who demonstrated less extravert characteristics than male farmers. Majority of the farmers grow exclusively for home consumption and the surplus is marketed. Hence, their overall entrepreneurial orientation was very low. Further, overall entrepreneurial behavior was also low. Interestingly, majority of the respondents interviewed via the social-media grow for commercial purpose, which illustrates higher entrepreneurial orientation of those farmers.

Distribution of Production and Profit

Farmers who displayed high entrepreneurial behaviour make a higher production (kg) per year. At the same time, their net income/profit (LKR) that can be obtained from 1000 grow bags of mushroom per cycle is also significant.

Imports and Exports

The main imports included button mushrooms, other mushroom varieties and related value added products. There is a growing demand for mushroom value added products within Sri Lanka and demand is mainly derived from the food and beverage sector. Sri Lanka's export market lies in Asian, European and Middle Eastern countries, with a stable market demand. Oceanic countries (Australia and New Zealand) and the North American region are prospective markets.

SWOT Analysis for the Industry

A careful identification of strengths, weaknesses, opportunities and threats (SWOT analysis) are vital for the industry's sustainability and tap potential markets (Table 1).

Table 1: SWOT Analysis for the Mushroom Industry in Sri Lanka

Strengths	Weaknesses
• Less capital requirement for the cultivation • Abundant rural labour force • Mix array and abundant quantities of raw materials for the industry • Less land and space requirement • Engagement of younger generation in the cultivation and marketing process of mushroom • Evidence of popularized social-media groups and network in the country	• Information asymmetry among producers and between producers and buyers • Inadequacy of proper extension service related to mushroom cultivation and value addition process • No proper mechanism to link producers and buyers in the country • Difficulties in conformance with standards and quality of mushroom • Less access to advanced production methods and machineries • Limited range of mushroom varieties used in the cultivation
Opportunities	**Threats**
• Tool to uplift rural livelihood • Possible value creation opportunities in the industry like (Frozen, canned, dried, soup powder, pickles, chips, paste, ketchup, noodles, pasta, biscuits, nuggets, mushroom based flour and additive in beverages, medical and cosmetic products, energy boosts etc.) • Window of opportunities available in both local and international markets for value added products • Increasing trend in demand for mushroom consumption	• Changing nature of policies related to international trade and economics • Low quality and illegal spawn production • Growing intra and inter-regional development disparities • Prevalence of alternatives and substitutes for mushrooms such as tofu, Zucchini, caramelized onions etc.

Source: Authors' own compilation based on survey data (2021)

Conclusions and Recommendations

Mushroom cultivation is an ideal agribusiness venture to promote in order to uplift the rural community. It has great potential to raise the incomes of both rural as well as the urban sector. Furthermore, the industry can possibly contribute to the national economy through value addition opportunities available in both local and international markets.

In most cases, both respondents' categories were found to be more introvert than extravert. A proper linkage was not established between all actors in many cases. Private entities somehow play a dominant role to build networks among producers and sellers. However, government bodies have not yet made a significant presence in the industry. The findings can derive the recommendations given below;

- **Implement comprehensive entrepreneurship development programs** among the smallholder farmers. Such programs, apart from concentrating on entrepreneurial awareness, training and credit facilities to farmers, must also concentrate upon bridging the new technology gap and opening new avenues of entrepreneurship.

- **Create a roadmap for the intensive farm entrepreneurship programme.** To this effect, equip the extension officers with sufficient training on entrepreneurship, which subsequently will help orient the farmers into becoming successful entrepreneurs.

- **Formulate an intensive adult literacy programme on mushroom cultivation** as high literacy has a great impact on inculcating entrepreneurial skills. If the improvement of farmer literacy levels is timeous then agricultural training can be conducted using low – literacy farmer training methods.

- **Expose the farmers to recent developments** in agricultural technologies and motivate them to adopt the new technologies by organizing group discussions, meetings, study tours and incursions. Farmer innovativeness can be created by making them join in commodity associations where they will receive regular technical and specialized agricultural support services.

- **Promote farmer diversification** into agro processing ventures as a way of adding value to farm products. Formation of partnerships with established agro dealers and retail outlets can reinforce this. This will help ensure that they work closely with each other in all areas attributed to the agribusiness chain, which in turn will strengthen communication and cooperation between the farmers and these institutions.

- **Establish a common database** for the industry linking all stakeholders to facilitate information symmetry.