



Review Article

Ensuring success in Oyster (*Pleurotus* Sp.) mushroom cultivation through marketing strategies - A case study and SWOT analysis

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Considering the vast scope for mushroom cultivation, many farmers and entrepreneurs are taking up mushroom cultivation in India. *Agaricus bisporus* though is the prominent edible mushroom in the country, other tropical mushrooms like *Pleurotus* sp, *Calocybe* sp. and *Volvariella* sp. are getting importance owing to the suitability of agro-climatic conditions. Many farmers succeed in successful cultivation of these mushrooms, while they are unsuccessful in marketing of the same. Several farmers even fail to succeed in mushroom cultivation because of lack of proper understanding about mushroom cultivation and the underlying principles. Hence, the constraints reported in mushroom entrepreneurship were analysed and a successful mushroom entrepreneur was identified among the mushroom growing entrepreneurs from Karnataka State in India. The case study and SWOT analysis was done to draw the inferences and lessons for new entrepreneurs to succeed in mushroom cultivation in India and in other tropical and subtropical countries with similar situations.

Key words: *Pleurotus* sp., Mushroom Entrepreneurship, Marketing, SWOT, Case Study.

INTRODUCTION

The demand for mushroom- a non-traditional vegetable is mostly restricted to urban localities. Similar to the trends reported in most of the advanced countries (Patterson, 2003; Mayett *et al.*, 2006), the white button mushroom (*Agaricus bisporus*) is the most preferred variety by the consumers in India also (Shirur *et al.*, 2014). The oyster mushroom (*Pleurotus* sp.) is promoted as the easiest and cheapest among the cultivated mushrooms (Upadhyay, 2011). Further, the oyster mushroom has many species which can be suitably cultivated in diverse agro-ecological situations (Shirur, 2011). However, the oyster mushroom growers though successfully harvest good yield, find it tough to sell all the fresh oyster mushrooms profitably in the market. The difficulties and constraints associated with marketing of oyster mushrooms lead the entrepreneurs to find the mushroom entrepreneurship less remunerative. Lack of institutional support or the absence of growers' cooperatives renders the oyster mushroom growers with low bargaining power (Shirur *et al.*, 2016). This has resulted in early and frequent exit of entrepreneurs from mushroom entrepreneurship (Shirur *et al.*, 2017).

Amidst such a situation, many entrepreneurs come, try, struggle to make mushroom entrepreneurship as their profession and then quit the mushroom entrepreneurship or switch to other avocations. Majority entrepreneurs were ruing the low consumer demand for oyster mushrooms and their short shelf life; leaving the success of their entrepreneurship to the chances of market dynamics. But, an oyster mushroom grower Mr. Kumar Kempaiah, near Bengaluru made certain the success of his unit, by ensuring the sale of all fresh mushroom produced in his farm. Mr. Kumar a graduate in Mechanical engineering, ventured into agribusiness activities by chance.

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METHODOLOGY

Case study research was undertaken in 2015-16 for a single complex functioning unit in the natural context with multitude of data collection tools. The literature survey was done to know the major constraints reported in mushroom entrepreneurship. Mr. Kumar Kempaiah being a highly successful case in oyster mushroom cultivation, was purposively selected for the study. Personal interviews, structured questionnaires (both closed and open ended) and personal observations were used for data collection, analysis and validation. Purposive selection of the unit for case study among 60 different mushroom growing entrepreneurs and their mushroom units was based on the results of 'entrepreneurial behaviour' and 'performance index' analysis by Shirur (2015). To measure the 'entrepreneurial behaviour' and 'performance index' as a continuous variable, scale developed by Shirur *et al.* (2015) by following the normalized rank approach (Guilford, 1954) was employed. Entrepreneurial behaviour was operationally defined as the combination of various socio-psychological, cognitive, affective and skill attributes of an individual entrepreneur to operate his enterprises successfully to earn higher economic returns. The 'Performance Index' was operationally defined as the combination of existing infrastructural, social capital, economic and efficiency dimensions of the mushroom unit and their incremental expansion or growth with the passage of time. In the end the SWOT analysis was carried out to analyse the strengths, weaknesses, opportunities and threats of the entrepreneurs' unit to draw the conclusions.

RESULTS AND DISCUSSION

Major constraints reported in mushroom entrepreneurship.

The literature was studied to understand the major constraints stifling the growth and success of mushroom entrepreneurship in different parts of the world. The important ones are listed in table 1.

Background of entrepreneur.

Mr. Kumar Kempaiah's personal penchant for consuming pesticide free, organic foods lead him to become a mushroom entrepreneur- an unfamiliar and unexpected role he could ever imagine. In his routine searching of the organic vegetables, fruits, jaggery, *etc.*, he learnt that, being highly nutritive vegetables- mushrooms are grown organically and hence started to purchase them occasionally. Meanwhile, he was also realizing the growing demand for organic foods in Bangalore city and thus started making his mind to take up the supplying of organic foods as his profession from young age. At this stage he came in touch with Brunns- the only organic egg producing poultry unit in India. He conceived of marketing these eggs among the elite consumer section in Bengaluru. He also found it tough to get access to the leading hotels and restaurants in the city. Even in cases where he got the access, they were very lukewarm to his idea of promoting organic eggs, which were priced three times higher than normal eggs. He remembered his old

Table. 1 Major constraints reported in mushroom entrepreneurship

S/No	Constraints	Reference
1	Farm designing	Requires considerable capital outlay (Yehuala, 2008); High cost of land acquisition (Celik and Peker, 2009); Lack of technical information and exploitation by consultants (Shirur <i>et al.</i> , 2015).
2	Growing medium/ compost preparation	Compost preparation and casing soil preparation require elaborate training (Singh <i>et al.</i> , 2010)
3	Spawn	Lack of availability of quality spawn and high price of spawn. (Singh and Suresh, 2007); Non availability of quality spawn (Gautam <i>et al.</i> , 2014)
4	Crop management	The electricity is the major constraint for white button mushroom unit (Pollack, 1995; Anon., 2005); "Non-availability of quality spawn" and "high electricity tariff" were perceived as the main production constraints (Singh <i>et al.</i> , 2008); Time lag to obtain a return on investment, lack of funds, insufficient production. (Michael <i>et al.</i> , 2008); Non availability of spawn and poor spawn quality, (Pattnaik and Mishra 2008, Gateri <i>et al.</i> , 2009)
5	Pest and disease management	Pest and disease infection are most important constraints after the spawn. (Singh and Suresh, 2007)
6	Marketing and economic returns	Marketing information is the major constraint in mushroom production. How to sell more mushroom than how to grow more mushrooms. (Michael <i>et al.</i> , 2008) Lack of information and fluctuating price (Singh <i>et al.</i> , 2008); Lack of Marketing channels and proper markets are distantly located (Gautam <i>et al.</i> , 2014); Middlemen exploit mushroom growers (Shirur and Shivalingegowda, 2015; Singh and Singh, 2014)
7	Processing and value addition	Lack of cold storage and non-availability of drying equipments. (Singh <i>et al.</i> , 2008); mushroom is highly perishable, lack of marketing facility (Pattnaik and Mishra, 2008)

friend- Shathbi Basu, a leading wine consultant to establish meetings with leading hotels and restaurants in the city. But in no time he was seeing a surge in demand for organic eggs from these hotels. Meanwhile he gradually expanded the sales of his organic eggs through retail outlets also. In a span of six months the roles reversed as the people started to plead him for more organic eggs to whom he pleaded initially to try them once! Buoyed by the success in marketing of organic eggs, he foresaw a similar opportunity in selling the mushrooms. However, he found that, the small-scale mushroom growers were not able to assure him to supply a constant quantity of oyster or milky mushrooms. He also observed the irregularity of mushroom production by many such small growers. This drew him to take up the production of organic mushrooms by himself. The decision to take up the mushroom cultivation was not an easy one for him as mushroom being a non-traditional vegetable; he also had no basic understanding about mushroom cultivation. But, he learnt the elementary procedures of mushroom cultivation restricted to its theory from his father- a retired horticulture officer in the State Department of Horticulture. Amidst the uncertainty of its full understanding and marketability, he decided to take risk thrusting his innovative ideas to make it successful.

He then surveyed the availability of raw materials, labour requirement and made a pilot survey of demand for oyster mushroom in local market. Sooner he realized that, the mushroom of high demand in local market is white button mushroom but requires huge investment on air handling unit and chillers to make the conditions suitable for growing it. On the contrary, the oyster mushroom with easy production techniques, high biological efficiency, requiring less financial investment was not in great demand by the retailers and vegetable sellers. Weighing between the two different risks of huge investment and poor marketability, he willingly took the second risk to create market for oyster mushroom and decided to cultivate the oyster mushroom suiting to the climate of the region. His decision was certainly influenced by his new found 'ability to sell' and also the already established marketing links.

Mr. Kumar, a graduate in mechanical engineering ventured into mushroom entrepreneurship with several of uncertainties but also with the hope of succeeding in it. He was depending on videos and documents available on internet and learnt about mushroom cultivation practices across the world, mostly in China and other East-Asian countries. He told he was awed by the quantum of fresh mushroom produced by each of the unit in these cases. He then started to search for successful mushroom growers in Karnataka and other Southern states and learns from them. After listening to mixed stories of success and struggle, he started mushroom cultivation in a small scale by assembling straw from nearby paddy fields and spawn from IIHR, Bengaluru. He was fascinated by the emergence of oyster mushroom fruiting bodies from

the spawned compost bags, which encouraged him to go for commercial production of mushrooms.

He took a small open site on rental basis in the outskirts of the city for erecting a temporary thatched shed and for storing the straw and other facilities. He followed very crude method to boil the water for pasteurising paddy straw. Initially he depended on firewood fuel for boiling water, which he realized, was inefficient and also adding to the cost of his mushroom production. He continued in the same place with same practice and attained stability and consistency in his production and productivity. On an average, he harvested 8-10 kg mushrooms per day. He used his marketing contacts established through the sale of organic eggs to sell his oyster mushrooms also. The retailers who till now had only button mushroom variety in their shelves started filling it with oyster mushroom also. When, the mushroom unit was just beginning to produce small quantity of mushrooms, Mr. Kumar packed them in 200 gm polythene packets and started sending them to retail stores with a brand name 'fabulous' mushrooms. When asked to recount his initial experience of selling the oyster mushrooms, he said he was also anxious about the retailers' response in purchasing his mushrooms. "First few weeks, the retailers purchased my mushrooms only to oblige me or to impress upon me to get more organic eggs. But, now oyster mushrooms themselves have become the commodity of demand on their own" recalls Mr. Kumar. Though, Mr Kumar was successful in selling the oyster mushrooms, he was feeling that the actual potential of the mushroom entrepreneurship is not yet achieved by him. A shrewd entrepreneur Mr. Kumar kept a record of all the accounts to realize that, he has not made any loss for sure but he was neither making a huge profit as he envisaged before. He identified the factor, which could spur his returns- the expansion of the size and scale of mushroom production. Since space was a constraint in Bangalore city, it also required him to spend too much on the open spaces available in his nearby locality. He made a choice of going outside the city to cut on the rental expenditure of the farm. So he found a farm land near Huskur village of Anekal taluk near Electronic city, Bengaluru. This also helped him in saving on the huge labour costs as he employed the labour of the same village.

In the new farm set up with an area of 10,000 sq. feet, he created the facility for pasteurization of straw, drying of straw, spawning, spawn run and cropping shed. He switched pasteurization of straw from traditional boiling method with fuel wood to electric boiler. Made innovative arrangement for drying the pasteurized straw (Details withheld temporarily on respondent's request). A hygienic shed was constructed for spawning. A *pucca* spawn running room was constructed to create the conditions suitable (Dark shed with provision for diffused light and high CO₂ concentration in the shed) for spawn running. The cropping shed built with bamboo and paddy straw of a dimension 125X28 square feet to hold 2000 beds of

substrate at a time.

Presently he is able to harvest 50-55 kg of oyster mushrooms consistently. He plans to moderate the level of production to meet the higher demand on weekends. But, sometimes, the demand is too much where his production falls short of the demand. On the weekdays he is able to match the sales in all the stores he supplies his mushrooms.

Unravelling the entrepreneurial behaviour and performance index score of Kumar

On the entrepreneurial behaviour index, Kumar's score (81.66) was highest among the oyster mushroom growers whereas, fourth highest among all the tropical mushroom growers. On the performance index score, Kumar's score was highest among all the growers of tropical mushroom variety. Hence, he can be ideally considered as the entrepreneur to have used his entrepreneurial skills to translate the results on performance index. Besides his overall score on these two variables, his scores on the dimensions of the two variables would help us to unravel the reasons behind his entrepreneurial success.

Mr. Kumar's score is in higher category for 7 out of 11 dimensions. The seven dimensions on which Mr. Kumar scores high are; innovativeness, achievement motivation, economic motivation, technical competency, management orientation, decision making ability and marketing orientation. He is highest on the innovativeness among all the growers of tropical mushrooms. Only three other entrepreneurs among the sample match his score on innovativeness. On the achievement motivation, he is placed jointly second along with 5 others with only one scoring more than him. On the management orientation and marketing orientation also, Kumar is among the highest two ranks followed by among the highest three in respect of technical competency and economic motivation. Mr. Kumar falls in the medium level on risk bearing ability and information seeking behaviour as it was observed that, 28 and 32 respondents out of 52 entrepreneurs, scores more than him on these two dimensions respectively. The medium risk bearing ability was also reflected in his decision not to invest heavily on button mushroom project, though he saw a good demand for button mushroom in the market. His medium level of information seeking behaviour was due to his reliance mostly on the internet for his information needs on mushroom entrepreneurship.

Mr. Kumar is very low on leadership ability and the scientific orientation. From his case analysis, it can be interpreted that, leadership qualities are not essential to be a successful entrepreneur. His response to statements on leadership ability suggests that, he is happy to concentrate on his business than being the leader in the mushroom entrepreneurship. Interestingly, on the scientific orientation, Mr. Kumar was over scored by 32 respondents

and another 7 matching his score out of the 52 respondents. Though, the scientific orientation is critical dimension of mushroom entrepreneurship, Mr. Kumar's low score on scientific orientation could be due to his affinity for innovativeness, which sometimes seeks to think beyond scientific reasoning. Further, it was also seen that, majority of the mushroom growers were having high scientific orientation. Therefore, in the sample of respondents with high scientific orientation, his level of scientific orientation might actually be on the higher side. On the performance index, he has highest score on the scale and size of enterprise. No other entrepreneur even matches his score on the scale and size dimension of performance index. He is among the second highest in respect of efficiency parameters with eight others matching his score. On the infrastructure, good mushroom cultivation practices and incremental expansion of the unit also, he is placed among the top 5-10 respondents, even as many respondents among these with matching scores. On the social capital, 8 respondents score above him whereas, another five are matching his score. Hence, it can be inferred that, though he is not highest among all the dimensions of the performance index, he is consistently stable in all the dimensions that influence the performance index score. The respondents scoring above him on few dimensions fail to maintain the same performance on remaining dimensions, thus failing to be as good performer as Mr. Kumar turns out to be.

Critical interventions that separates Kumar from other oyster mushroom growers.

Though, he had the advantage of already established market links through organic eggs, it must be recalled that, he was innovative and also persisting in his efforts to create the demand for these organic eggs. So the entrepreneur's shrewd approach to tap their existing strengths to promote their products and services is the key. Kumar sets yet another example of case study in that. His entrepreneurial success can be attributed to his personal preference for organic foods leading to his newfound passion to make it his business to promote the same among people.

As surveyed in Karnataka, majority entrepreneurs do not realize the importance of maintaining separate spawn running room and cropping room. Since, the two stages of crop growth in mushroom production require contrasting ambience with respect to the level of Oxygen (O₂), Carbon di-oxide (CO₂), light, temperature and relative humidity, it is advisable to create respective conditions for these phases. Kumar has realized its significance and practiced the mushroom cultivation on scientific basis. Hence, he typifies the importance of understanding the scientific basis of mushroom cultivation and artistically adjusting the micro-climate to grow the mushroom successfully.

Table 2. Key interventions of Mr. Kumar to succeed in mushroom entrepreneurship.

S/No.	Key interventions and strategies	Advantages
1	Simple and low cost farm design and growing mushrooms suitable to local climate.	Unlike huge investment on button mushroom plants, he made simple sheds with bamboo and thatched roof with less investment. Less operating costs on maintaining the temperature of the growing sheds as the local weather supports the cultivation of oyster mushrooms.
2	Proper pasteurization and appropriate moisture during substrate preparation	He follows mostly hot water treatment and maintains 55-60 per cent moisture in the substrate at the time of spawning.
3	Separate room for keeping the spawned substrate during spawn running stage	Quick spawn run and less chances of contamination
4	Spawn purchase from local place	Purchases the spawn from ICAR-IIHR, Bengaluru or from private spawn laboratories situated in Bangalore.
5	Using a motorized centrifugal spinning drum to remove moisture from pasteurized straw	Appropriate moisture at the time of spawning. Reduces the human labour cost and drudgery
6	Marketing through retail outlets	Sale is assured. Less damage due to extended shelf life of mushrooms.
7	Sticking to scale of economy	Ensuring a minimum scale of production has given dividends in the form of scale of economy.
8	Gradual expansion of enterprise	This has helped him to plan the expansion in a phased manner and expand the market accordingly.

Most growers start with a small-scale of oyster mushroom production. But they fail to realize the dis-economy of scale for small-scale production unit. The transaction costs involved in bringing the raw materials like straw, spawn, and disguised unemployment of labour for cutting straw, spawning and harvesting *etc.* will lead to lower benefit cost ratio. Hence, it is a case that demonstrates the importance of scale of economy in oyster mushroom production unit. The minimum quantity of not less than 50-60 kg per day has been found rewarding in the case of Mr. Kumar Kempaiah. Most importantly, he is able to sell all the mushroom he produces in his unit. All the key interventions of Mr. Kumar are listed in Table 2.

SWOT analysis

Strengths

Marketing linkages established by his contacts of other businesses and the ability to use the same to his advantage are his biggest strengths. The understanding of technical nuances of mushroom growing and ability to manage a profitable scale of production are his other strengths. His management efficiency is also his strength.

Weaknesses

Dependence on spawn from Government institutions or other commercial spawn suppliers are his weaknesses, as he will not have any control over the regularity of supply and quality of the spawn at source and in transit.

Opportunities

The increasing awareness among people about mushrooms and the increasing demand for mushrooms in the market are the best opportunities for Mr. Kumar. Being

close to Bangalore will be a huge opportunity to expand the demand for his mushrooms.

Threats

The white button mushroom produced from adjacent States of Goa, Maharashtra and Andhra Pradesh are posing a competition for his oyster mushrooms. Lack of diversification of mushroom unit by growing a single variety is another major threat for his business.

CONCLUSION

Based on the case study and the SWOT analysis, it is clear that mushroom entrepreneurs need special attributes of entrepreneurial behaviour and understanding about the performance indicators. It must be borne in mind that, working out the profitability based on scale of economy, out of the box ideas on packaging and marketing, understanding the nuances of biology of mushrooms, strategies to reduce expenditure on energy for temperature modulation during cropping and personal involvement in enterprise and dedication are key to succeed in mushroom entrepreneurship.

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