Dissemination of Mushroom Production Technologies and Viability of Mushroom Enterprises: A Study of Cuttack, Odisha

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ABSTRACT

To harness mushroom production and popularise the mushroom enterprise, Krishi Vigyan Kendra of ICAR-National Rice Research Institute located at Cuttack, Odisha is making all-round effort for dissemination of technologies through capacity building, frontline demonstrations, field days and advisory services to the farmers, farm women and rural youths regarding scientific mushroom production technologies, crop management, disease and insect management, post-harvest processing and value addition of produce. A total number of thirty five training programmes were conducted total consisting 1150 progressive farmers, members of SHGs and rural youths covering all 14 blocks of the district from the year 2011 to 2016. A total numbers of 485 front line demonstrations were conducted for horizontal spread of the technologies. Inspired by the easy method of cultivation, good yield and economy of production and being exposed to extension interventions made by KVK, more than 74% participants started both paddy straw (Volvariella spp.) as well as oyster mushroom (Pleurotus spp.) cultivations in different seasons. Though much effort had been given for technology dissemination, viability of the mushroom enterprises was not shown satisfactory results. During the study, it was found that about 27%, 39% and 22% of the farmers discontinued mushroom cultivation in the 1st year, 2nd year and 3rd year of the cultivation respectively. Only 12% of farmers were continuing for commercial production of mushroom in the 4th year. As most of the mushroom growers belong to small, marginal and landless categories, lack of Credit facilities in the form of loan or subsidy, non-availability of quality spawn in the district, unorganised market sector, fluctuating price prevailing in the market, changing weather conditions, lack of value chain system were some of the major challenges faced by the grower which need to be addressed.

Keywords: *Mushroom production, enterprise*

INTRODUCTION

Mushroom is one of components that not only impart farming system diversification but also help in addressing issues like nutritional security, rural employment, recycling agricultural residues, economic growth and environmental sustainability. Mushrooms called as 'white vegetables' or 'boneless vegetarian meat' contain ample amount of proteins, vitamins, minerals and fibre. In the present diet conscious era, mushrooms are increasingly considered as a future vegetable owing to its medicinal and nutritional properties and the consumer demand for mushrooms markedly expanded in the recent years. The average land holding of the farmers are decreasing day by day by creating more marginal small farmers group. As only agriculture is becoming unremunerative, the small and marginal farmers are shifting away from farming in view of decreasing net income from agriculture (Singh and Bhogal, 2014). As mushroom production is mostly an indoor activity, it requires limited land, suited to small farmers and landless labourers. Besides mushroom have high bio efficiency i.e., conversion of dry substrate into fresh mushroom within very short time and spent mushroom substrate (SMS) can be used to produce organic manure. Black carbon emission from biomass burning, is the second largest contributor to the current global warming. Utilization of agro-residues for mushroom production will not only help to reduce the environmental pollution but also profitably recycle them into quality food, besides improving soil health due to recycling of spent mushroom substrate. India produces about 600 million tonnes of agricultural by-products, which can profitably be utilized for the cultivation of mushrooms. Currently, 0.04 per cent of these residues are being used for producing around 1.2 lakh tons of mushrooms. Even if 1 per cent of the residues can be used for mushroom production, 3.0 million tons of mushrooms and about 15 million tonnes of compost can be produced (Vijay *et al*., 2011). Mushroom cultivation enterprise can also play a significant role in alleviation of poverty through generation of additional employment in the rural areas.The recent trends in consumer behaviour

surges the demand for high quality niche products and forces the agriculture sector to step up and adopt commercially, technically and economically viable agribusiness solutions (Shirur *et al.*, 2016).

In Odisha, mushroom production is widely spread in all the 30 districts and comprises 12 per cent of total country's mushroom production. It is the leading state in paddy straw mushroom production with the annual production of 9550 metric tonnes contributing to 80 per cent of the total production of the country. Paddy Straw mushroom contributes to about 60 per cent of the total mushroom production of the state (Sharma *et al.*, 2016). Other than paddy straw Odisha also have enough production of oyster mushroom and very limited in button mushroom production.

Table 1
Commercially grown mushrooms of Odisha

Types of mushroom	Period of Cultivation	Production per annum (MT)	Percent contribution (%)
Straw	March-October	9550.00	59.7
Oyster	November - February	6310.00	39.5
Button	Round the year	126.00	0.8
Milky	March-October	-	-
Total		**15986.00**	**100**

Scope of mushroom production in Cuttack district

Cuttack district is located between 840 58' to 86 20' East longitude and 200 03' to 200 40' North latitude with an altitude of about 15 meters above MSL and receives an average annual rainfall of about 1501.3 mm. The district represents two agro climatic zones viz. East and South Eastern Coastal Plain and Mid Central Table Land characterized by hot and humid and Hot and moist sub humid climate. Rice is the main crop of the district. It cover 1, 40,000 ha area out of total cultivated area 1, 88,150 ha (ODG, Cuttack, 2016)

The marginal and small farmer holders of the district constitute about 91.83 per cent possess total land holding of 69.85 per cent area and most of the farmers are engaged in agriculture as main livelihood. Rice is the principal crop which occupies 42.65 per cent of the gross cropped and 70.85 per cent of the cultivated area. A huge amount of paddy straw is generated after harvesting the grain from the plant which generally used as thatching material, fodder and a bigger amount goes for manure preparation as such. So the paddy straw can be used for mushroom cultivation and then can be used as FYM. Cuttack has large numbers of urban and peri-urban population with mixed culture leading to a very good mushroom demand in the city. The development of rapid infrastructure facilities and well-organized distribution network provides the greater scope for marketing of perishable products in order to meet domestic consumer demands.The rural youth and farm women especially can take it as an income generating activities as it needs very low investment.Its strategic geographical location, very good net return, market demand and failure of broiler farming (poultry farming) creates scope for Mushroom production as entrepreneual activity in Cuttack district.

METHODOLOGY

Cultivation of both paddy straw (Volvariella spp.) as well as oyster mushroom (Pleurotus spp.) was initiated in Cuttack district in different seasons of the year. To harness mushroom production and popularise the enterprise, Krishi Vigyan Kendra of ICAR-National Rice Research Institute located at Cuttack, Odisha has made an all-round effort for dissemination of technologies through capacity building, frontline demonstrations, field days, field visits, entrepreneurs meet, exhibitions, and advisory services to the farmers, farm women and rural youths regarding scientific mushroom production technologies, crop management, disease and insect management, post-harvest processing and value addition of produce etc. In collaboration with ATMA, RKVY, OCTMP, ICAR-

NRRI and different non-Govt. organizations a total number of thirty five vocational training programmes were conducted covering 1150 progressive farmers, members of SHGs and rural youths from all 14 blocks of the district from the year 2011 to 2016. A total numbers of 485 front line demonstrations were conducted for horizontal spread of the technologies during the period.

Though much effort had been given for technology dissemination, growth and viability of the mushroom enterprises was not shown satisfactory results. So to ascertain the growth limiting factorsastudy was undertaken in the district covering 140 mushroom growers started mushroom cultivation under the supervision of KVK purposively selected from all the blocks.An interview schedule was developed to collect the data regarding the viability and their reasons for discontinuation ofthe enterprise. Personal interview using interview schedule and focused group discussion techniques were used for collection of information.

RESULT AND DISCUSSION

Total numbers of 35 training programmes in 14 blocks of the district were conducted on paddy straw and oyster mushroom cultivation including 1150 beneficiaries during the year 2011 to 2016. Initially, in the year 2011-12 total numbers of 210 participants were trained out of which 138 participants were started their mushroom units. The percentage was decreased in the nest year (2012-13) but again it showed an upward direction in the subsequent years.

Technology dissemination process

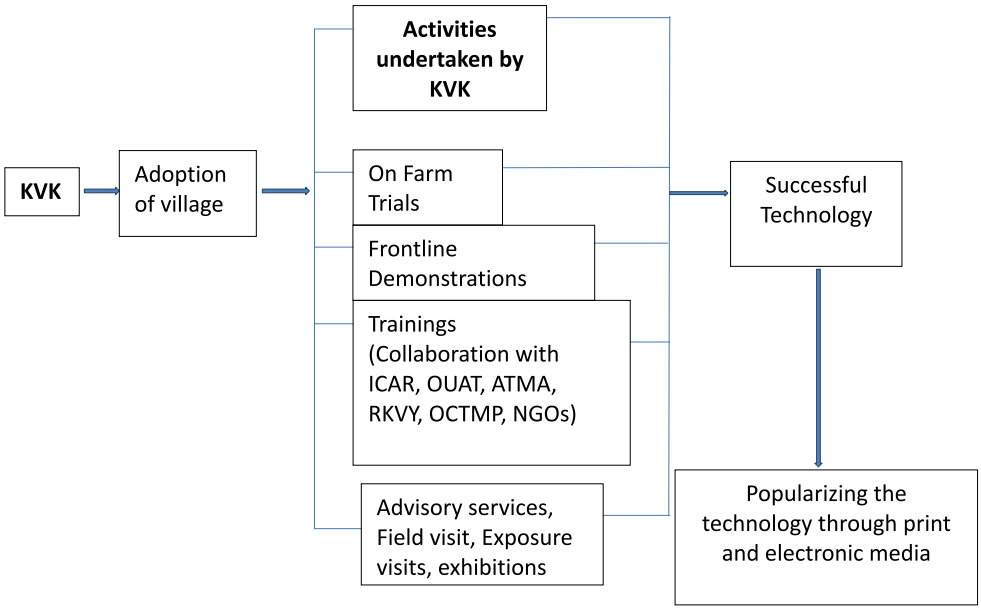

Table.2
Programmes conducted for technology dissemination

Year	No. of Programmes		No. of participants	No of participants started their mushroom units	Percentage (%)
	Trainings	FLDs			
2011-12	7	108	210	138	65.7
2012-13	6	76	180	109	60.5
2013-14	4	52	120	88	73.3
2014-15	8	137	280	232	82.8
2015-16	10	112	360	290	80.5

The growth of the enterprise was fast, mostly among the small, marginal, landless, women farmers and unemployed youths. The reason for fast spread of the enterprise could be attributed to certain advantages like better taste, short production period, easy and simple cultivation method, higher profitability and potentiality of the enterprise to provide gainful employment. But the sustainability and viability of the mushroom units were not upto the expectations. During the study, it was observed that about 27%, 39% and 22% of the farmers discontinued mushroom cultivation in the 1st year, 2nd year and 3rd year of the cultivation respectively. Only 12% of farmers were continuing for commercial production of mushroom in the 4th year.

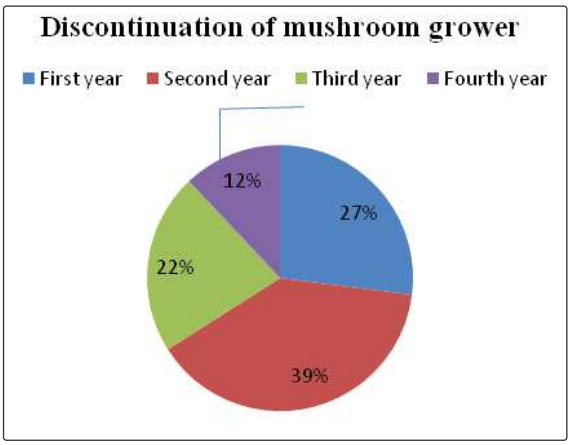

Fig. 2 Discontinuation of mushroom growers

The major limiting factors identified during the study were given below in the Table. 3. It was observed that lack of credit facilities in the form of loan or subsidy (63.57%), non-availability of quality spawn in the district (77%) were two major reasons for their discontinuation. As mostly unemployed youths and small and marginal farmers have established theenterprise they required more investment in subsequent years, but it was difficult for them to get bankable loan and very limited grower only could avail the subsidy provided through different projects of state government.

Table.3
Factors responsible for discontinuation of mushroom enterprises

Sr. No.	Parameter	Frequency	Percentage (%)	Rank
1	Lack of credit facilities in the form of loan or subsidy	89	63.57	I
2	Unorganised market sector of mushroom	67	47.85	III
3	Fluctuating price prevailing in the market	42	30.00	VI
4	Changing weather conditions	36	25.71	VII
5	Non-availability of quality spawn in the district	77	55.00	II
6	Lack of value chain system	55	39.28	IV
7	Non-availability of paddy straw due to mechanization in paddy harvesting	18	12.85	X
8	Problems of pests and diseases	21	15.00	IX
9	Lack of facilities for processing and value addition during market glut	49	35.00	V
10	Exploitation by middlemen	33	23.57	VIII

On the other hand the female growers i.e. the member of SHGs they faced the problem like unavailability of quality spawn in the district as very meagre spawn production units established in the district till date. They had to depend on the middle man or other people for supply of quality spawn who used to charge more money for that. Unorganised market sector (47%), Lack of value chain system (39.28%), Lack of facilities for processing and value addition during market glut (49%) fluctuating price prevailing in the market (30%), changing weather conditions (25.71%), exploitation by middlemen (23.57%), problems of pests and diseases (15%) and non-availability of paddy straw due to mechanization in paddy harvesting (12%) were some of the major challenges faced by the growers which need to be addressed.

CONCLUSION

There is potential for mushroom industry to thrive in the district and provide lucrative job opportunities to maximize the sustainable use of local natural resources. For the same viability of the mushroom enterprise for long run is very much important. Due to lack of infrastructural investment, enterprises run in low cost thatched houses or in open bed system. During thunderstorm and heavy wind, the mushroom units get destroyed and need to repair or built again. It can be also inferred that most of the growers do not get proper venues for marketing of produce and availability of cooperative system can be very helpful for them.Though there is increasing number of agencies and promoters to promote the enterprise like state departments, Krishi Vigyan Kendra and NGOs, some modification in policy issues and strong actions by stakeholders is required regarding finance, good quality spawn, channelization of value chain system, organized market system, proceeding and value addition units, formation of mushroom growers federation etc. to make the enterprise viable and stable in the long run.

Recommendations

- Liberal credit policy at cheaper interest rate for small and marginal mushroom units to enable them to compete with organized big industries of the agro-processing sector.
- Cost-effective and adequate supply of raw material by strengthening direct linkages through suitable contract farming models safeguarding the interests of mushroom growers especially for women SHGs.
- Mushroom units may be registered with district horticulture department so as to provide the benefits of credit facilities, subsidy, technology, sale promotion and processing of the produce.
- Encouraging formation of mushroom growers consortia or associations or federations to formulate collective marketing and sales promotion strategies like milk federations
- Mushroom value chain system may be promoted which may include different stakeholders like technology provider, spawn producer, mushroom growers, traders and processing and marketing companies.
- Mushroom being a highly perishable crop and prone to high temperature, marketing infrastructure such as cold storage facilities is of immense importance. Similarly, suitable arrangements are needed by the processing and value addition units for the management of surplus mushroom
- Proper policy support to promote women entrepreneurs in processing sector by emulating promising models already functioning in the state,
- Strengthening of database on agro-processing industries (mushroom enterprises) through regular surveys to plan and monitor the enterprises and to provide policy input to the government on a continuous basis.

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