

# Economic and Nutritional Security of Farmers through Mushroom Cultivation

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*Agriculture is the backbone of Punjab economy. It has set new records of yield and production of various field crops. Assured irrigation, quality seed of improved varieties, assured marketing of certain crops at MSP are some of the major factors for agriculture development in the state. But all of these factors has also led to monoculture which is clearly visible from the prevalence of rice-wheat crop rotation. Sangrur district of Punjab is classical example where all of these events are evident. Sad part of the story is that the crop rotation has led to numerous problems related with production, sustainability, ecology, environmental pollution etc. This rotation produces a huge volume of biomass in the shape of crop residue. On the one hand due to stagnated yield income of the farmers has no increment and on the other hand they are facing great difficulty in managing the load of crop residue by different ways other than burning.*

**Key words:** Alternative non-veg diet, Crop residue, Farmer-Scientist Interface, Mushroom

FARMER FIRST Programme (FFP) was initiated to find solutions for farmers' problems and replicated it for masses. In Punjab this project is operational in the villages Chatha Nanhera and Taranji Khera of district Sangrur. These villages have more than 85% area under wheat-paddy rotations representing the district in a huge volume of biomass in the shape of crop residue. It was challenging for the project team to give an intervention which is not only helping in managing the crop residue but also enhancing income of the farmers. So after brain storming by the team members, one possible solution was evolved in the shape of mushroom cultivation. This enterprise does not require much land and capital resource, but farmers and farmwomen had to be trained in these enterprises to successfully undertake this venture. The raw material used for the composting or growing material is the simply crop residue of wheat and paddy. Therefore, keeping in view of these

advantages, mushroom cultivation was introduced in the adopted villages under FFP. Initially farmers were totally unaware about the mushroom cultivation. Due to the lack of awareness, they were reluctant to adopt this enterprise because they thought that it was a complex



Fig. 1. Shri Buta Singh with his mushroom bags

technology. The project team conducted group meetings with the potential farmers, cleared their doubts and motivated them to adopt mushroom cultivation as an enterprise. After the continuous efforts, a total of 40 farmers made ready to go for this enterprise. These 40 farmers were provided with trainings for the cultivation of the Tropical mushrooms (*Calocybe indica* and *Volvariella volvacea*) and Temperate mushrooms (*Agaricus bisporus* and *Pleurotus* spp.). Mushroom spawn and demonstration bags were supplied to the growers. Scientists of the team have regularly visited them so as to keep them in pace and not to leave in between. Their interest was kept intact by using various extension methodologies like method demonstrations and result demonstrations, etc. They were also made aware that mushroom was a protein rich diet. As majority of the people are vegetarian or occasional meat consumers, mushroom is a very good alternative of non-veg diet and

could be an important component of nutritional security.

At last, a total of 39 farmers got success in the cultivation of mushrooms. Out of these 39 farmers, a total of 16 has decided to continue and upscale this enterprise in future while other were still keeping this venture to fulfill domestic needs only. From these mushroom growers a total of 37 growers were taken to exposure visit to a commercial mushroom grower Bajwa Mushroom Farm, village Bhole Saida, (Kurukshetra). At Bajwa Mushroom Farm they were apprised about commercial mushroom production and management of commercial mushroom farm. They were also told about the potential markets and other marketing strategies like processing of mushroom, cold storage, etc. In this way every possible strategy was used to make introduction and sustainability of this important agro enterprise. Economics of the demonstrations was also calculated and it was found that from paddy straw mushroom and milky mushroom a cost benefit ratio ranging from 01:1.75 to 1: 2.2 was obtained. Although about half of the farmers has grown mushroom for household level only but there was 16 farmers who had sold mushroom in the local market or village level. Five farmers have grown mushroom at relatively large scale. They were having large quantity of produce even after meeting the domestic and



Fig. 2. Cleaning and grading of mushrooms

village level needs. Project team helped them to create linkages with the hotels, marriage palaces of nearby cities, self-help groups where all of their produce was absorbed at handsome prices. They were able to sell button mushrooms at the price of ₹ 60-90/kg with these direct market linkages.

Though many farmers are tasting success in this venture but some of them are worth mentioning. Young farmer Shri Buta Singh (23) from village Chatha Nanhera (Sangrur) has started small scale production of mushrooms at village level (Fig. 1). He is earning approx. ₹ 2,000 daily from small mushroom production unit. The journey from small scale farmer who follows traditional cropping pattern to mushroom grower started two years ago when he come in contact with the scientists working under FFP, where he came to know about the idea of mushroom production. The basic training for the

mushroom production started from team of scientists of the FFP at village level. They provided him basic training and mushroom spawn and conducted demonstration at his field. This further intensified his desire to start the venture and then he visited University for 5 day training course on mushroom production. After attaining the proper training from the University, he started preparing his own compost and then mushroom production. The first harvesting of mushrooms occurred during December 2018 and has generated additional income of ₹ 60,000/- from 30 quintal compost within two months of starting mushroom cultivation (Fig. 2).

With the help of his brothers, he developed a low cost technology by raising a thatched house structure for growing mushroom. The indigenous technique not only decreased the cost of production but also enhances the growing period as the temperature inside theses houses remain low. The new technique has not only helped unemployed rural youth in adopting mushroom cultivation for self-employment but also to marginal farmers to adopt mushroom farming as an allied activity to raise their income. He is very happy with the daily income from mushroom apart from other crops and he is also inspiring other farmers of Chatha village to start subsidiary enterprises along with farming. Despite not making a heavy investment and too much labour, he started making good income and his success is motivating fellow villagers to follow the path and cultivate mushrooms. He is having plans of expanding his unit and is

Table 1. Cropping pattern followed in selected villages during 2015-16

| Name of the Village | Kharif  |             | Rabi      |             |
|---------------------|---------|-------------|-----------|-------------|
|                     | Crop    | Area (Acre) | Crop      | Area (Acre) |
| Chatha Nanhera      | Paddy   | 2826        | Wheat     | 3388        |
|                     | Basmati | 400         | Mustard   | 50          |
|                     | Fodder  | 550         | Fodder    | 500         |
| Taranji Khera       | Paddy   | 400         | Wheat     | 400         |
|                     | Fodder  | 30          | Berseem   | 25          |
|                     | Maize   | 30          | Sugarcane | 30          |

Table 2. Extension activities organized for the promotion of mushroom cultivation

| Activity                | Number of activities | No of Participants |
|-------------------------|----------------------|--------------------|
| Group meetings          | 15                   | 400                |
| Field visits of experts | 15                   | -                  |
| Trainings               | 7                    | 215                |
| Method demonstrations   | 16                   | 220                |
| Exposure visits         | 1                    | 37                 |
| Result demonstrations   | 2                    | 80                 |

**Table 3.** Economics of mushroom growing enterprise adopted by farmers

| Type of mushroom | No. of farmers | Straw processed (qtl) | Yield (kg/bag or kg/m <sup>2</sup> ) | Economics of demonstration (₹/unit) or (₹/m <sup>2</sup> ) |                  |                | B:C ratio | Mode of selling       |
|------------------|----------------|-----------------------|--------------------------------------|------------------------------------------------------------|------------------|----------------|-----------|-----------------------|
|                  |                |                       |                                      | Gross cost (₹)                                             | Gross return (₹) | Net return (₹) |           |                       |
| Paddy Mushroom   | 3              | 3                     | 15.5kg/q                             | 30/kg                                                      | 60/kg            | 30/kg          | 01:02     | Directly to consumers |
| Milky Mushroom   | 5              | 1.2                   | 40kg/q                               | 35/kg                                                      | 60/kg            | 25/kg          | 01:02     | Directly to consumers |
| Button Mushroom  | 5              | 29                    | 27kg/q                               | 40/kg                                                      | 70/kg            | 30/kg          | 01:1.75   | Directly to consumers |
| Dhingri          | 3              | 20                    | 50kg/q                               | 55/kg                                                      | 30/kg            | 01:2.2         |           | Directly to consumers |

going for direct marketing options for the produce. Earlier he was suspicious about marketing of glut produce. The project team linked him to different hotels, restaurants, marriage palaces and local venders of nearby cities to do direct marketing. Now consumers have started recognizing him and he is getting good orders and also supplies mushroom in various social functions of the area

At present, there are five mushroom growers in the village that are actively involved in the

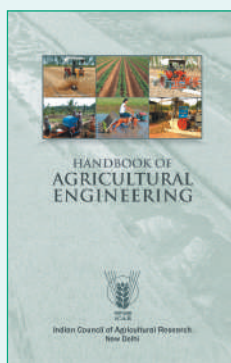
commercial production of mushrooms and it has increased their farm income by adopting subsidiary enterprise.

Mushroom can be grown all around the year as we have four different types of mushroom for different season which can give regular income on daily basis. On the other hand it consumes paddy straw and wheat straw as raw material which is a good remedy for the problem of straw burning. Also rural people who are not getting balanced diet and lacking various vitamins,

mineral and proteins can be made nutritionally secured with the abundant supply and changing dietary habits. Farmers FIRST Programme is not only helping in income enhancement of farmers but also playing a povital role in environment conservation and meeting nutritional needs of the rural community.

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