

MUSHROOM CULTIVATION USING AGRICULTURAL WASTES AS A SUSTAINABLE LIVELIHOOD ALTERNATIVE FOR RESOURCE POOR SC/ST RURAL WOMEN

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ABSTRACT

Emancipation of women is an important indicator of economic development. Rural women are well organised in recent years through Self-Help Groups (SHGs), but no significant efforts are made for them to venture into entrepreneurial activities. The study was undertaken to know the impact of extension intervention in adopting mushroom cultivation among the resource poor scheduled caste / scheduled tribe (SC/ST) rural women using locally available agricultural wastes in four districts of Karnataka State viz., Shimoga, Mandya, Hassan, and Tumkur where agricultural wastes such as areca husk, coffee husk, sugarcane trash and coconut coir pith are available respectively, in abundant quantity. The results revealed that there has been an appreciable improvement in the mean score of knowledge on all aspects of mushroom cultivation before-and-after the interventions. They got fairly good crop and the average yield of mushroom per spawn pocket that ranged from 0.90 kg to 1.10 kg with the sale price lying between Rs.40 and Rs.52 per kg. Based on the study, it is recommended to promote mushroom cultivation through capacity building, extending facilities for creating the required infrastructure and developing local markets for mushrooms in the mid-day meal scheme, hospitals, hostels and prisons.

Introduction

The status of women in a society is an index of its degree of civilisation. Emancipation of women is one of the indicators of their economic development. As long as women are excluded from socially productive work and are restricted to household chores, the opportunities available for the development cannot be harnessed fully in the path of economic and social progress. When proper education and entrepreneurial climate are provided, women force can become a potential human resource for national development. Now-a-days Self-Help Groups (SHGs) have become the agents of socio – economic transformation in rural areas. These SHGs, normally comprising people from the poor

and weaker sections, are able to mobilise small savings through weekly or monthly meetings contrary to low or no savings earlier. Further, SHGs have been able to effectively recycle the resources generated among the group members for meeting their emergent credit needs.

By and large, the experiences of SHGs reveal that their major activity is confined to financial transactions by lending the money to their members. Though financial and human capital are effective in SHGs, they suffer from initiations and presence of poor social capital, which consequently acts as hindrance to go for joint venture through new enterprises. Hence, it is a prime concern to initiate the enterprises or

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economic activities, by joining together and share the cost, responsibilities and tasks for improving the livelihood. In this context, locale-specific, low-cost, socially and culturally acceptable enterprise like that of mushroom cultivation would certainly enable the vulnerable and the marginalised. India is blessed with varied agro-climatic conditions, as in most of its parts the weather is aptly suitable for the cultivation of mushroom. Though India has been traditionally a major mushroom growing country, the efforts are very limited to encash this crop for commercial venture. Above all, ultimately mushroom cultivation can facilitate families to earn additional income through self-employment. It can help in getting nutritional supplements and reducing rural poverty.

Among many varieties of mushroom, oyster is one such variety which can be grown on a wide range of agricultural wastes and thereupon degraded agricultural wastes (spent substrata) can be used as manure which consequently contributes to checking the ecological pollution. With this background, the purpose of this study is to examine the impact of extension interventions on mushroom cultivation and existing market network and to suggest a model market network for mushroom.

Methodological Issues Involved

The study was undertaken during 2007 in four districts of Karnataka State, India viz., Shimoga, Mandya, Hassan, and Tumkur, where agricultural wastes like areca husk, coffee husk, sugarcane trash and coconut coir pith are available respectively, in abundant quantities. These crops occupy the sizable area viz., arecanut 32,938 ha, sugarcane 43,490 ha, coffee 35,015 ha, coconut 1,25,511 ha, respectively in these districts (Anon 2007). But the wastes of these crops are not being used potentially by the farmers. Instead, these wastes were either used as fuel or dumped on roadsides causing environmental pollution. Certainly it would provide an opportunity to the villagers, specially vulnerable sections, to have additional income generating activity by growing mushroom using these wastes.

The villages, for the purpose of conducting this research study, were identified by considering the areas under the crops mentioned above and the quantity of the agricultural wastes available, population of scheduled caste / scheduled tribe rural farm women and the existence of active women Self-Help Groups (SHGs) operating in these villages. The present status of the agricultural wastes and the opportunities of using these for producing mushroom were ascertained by applying different Participatory Rural Appraisal (PRA) tools like transact walk, mapping exercises, ranking exercises, resource flow diagrams, etc.

From each of the four districts one village was selected based on the highest SC / ST population and more number of active SHGs from these communities. The selected villages are Honnavile from Shimoga, Bevinahalli from Mandya, Kadlur from Hassan and Basavapura from Tumkur districts. Further, these villages are situated nearer to the towns / district headquarters, which would facilitate easy marketing of the produce.

From each village, one Women Interest Group comprising resource poor SC / ST population was formed from among the existing SHGs. The group comprised 20 members, as per the existing structure for formation of SHGs. The respondents were selected based on their interest and voluntary participation to take up mushroom cultivation on a sustainable basis. Thus, the total sample size constituted 80 respondents at the rate of 20 members per group from each village.

Selection of Enterprise : Mushroom cultivation was selected as an appropriate enterprise for the study. It can be grown successfully in a wide range of agricultural wastes, the enterprise is technically less complex, it requires less space and need minimum infrastructure facilities so that a poor household can grow mushroom successfully (Madan and Thakur, 1991). Further, it is an additional income generating activity for the vulnerable women folk by effective utilisation of leisure time,

providing employment, low cost eco-friendly enterprise and requiring not much investment. Additionally, mushroom provides very nutritive food and hence can play a major role in enhancing nutritional security of the poor households, particularly checking malnutrition among pregnant women and children. Since, mushroom contains high protein and low fat it is preferred by many people as a diet supplement. All these provide mushroom enterprise greater opportunities for marketing and more scope for value addition.

The before-after experimental research design has been adopted for the study. The benchmark information regarding socio – economic profile, income, savings and participation in SHG activities and perception

about agricultural waste on the ecology have been collected from the SC/ST farm women. The other necessary data pertaining to availability of agricultural wastes, farm women's perception about the pollution created by the agricultural wastes on several dimensions, time and resource management were also collected by applying PRA techniques and personal interview method.

Extension Interventions: Series of extension educational activities were conducted during the period under study, to create awareness and interest about the productive use of agricultural waste for mushroom cultivations; and its advantages in terms of income generation, employment, enhancing the food nutritive value and reduction of pollution. The extension educational activities conducted are as follows:

| S.No. | Extension Intervention | Number |
|-------|--|--------|
| 1. | Orientation of all SHG members of the village | 04 |
| 2. | Focused group meetings | 04 |
| 3. | Skill training on mushroom cultivation | 08 |
| 4. | Capacity building activities on processing, value addition, marketing, packing and storage of mushroom | 04 |
| 5. | Follow-up visits | 07 |
| 6. | Telephone calls | 23 |
| 7. | Technical bulletin (Kannada) | 01 |

Demographics: Twenty four variables were studied including five situational variables. Majority of the respondents (62.5 per cent) were middle aged, 32.5 per cent were illiterates, 80 per cent were married, two- thirds (66.25 per cent) lived in tiled house and 50 per cent possessed cooking stove. A large number of the respondents (81.25 per cent) were depending on daily wages in off- seasons for their livelihood along with attending day-to-day household activities. These people had less than one hectare of landholding. Among them more than half of the respondents (55 per cent) were in the income range of Rs. 1000- 2000 per month and 61.25 per cent had savings in the range of Rs.100-200 per month. In general, more than

half of the respondents (56.25 per cent) had no extension participation and had medium (50 per cent) level aspiration. Nearly half of the farm women (47.5 per cent) had low to medium level risk taking ability. Among them a little more than one-thirds of the respondents (35 per cent) had high trust in agencies like Karnataka State Department of Agriculture, State Agricultural Universities, Farmers Associations, Private firms, Local bodies etc. Three-fourths (70 per cent) had high economic motivation and more than half (52.5 per cent) had medium level usage of mass media. Further, 50 per cent of the respondents lived within 5 km distance from the nearest city, nearly half (46.25 per cent) of them had low level of innovativeness and more than

half (60 per cent) of the respondents had low level of decision-making ability.

With regard to situational variables, majority of the respondents (63.75 per cent) were unaware of government schemes, and a large number of them (93.78 per cent) did not have membership in any community/constitutional institutions. Likewise a majority of respondents (87.50 per cent) felt as socially secured. More than three-fourths (76.25 per cent) of them were allowed to participate in social activities and in two villages they were not much excluded from the activities of the society.

It implies that the respondents belonged to the section of the rural community having low socio-economic profile which portrays poor education, less landholding, minimum income and shouldering family responsibility with scanty amenities. For them, timely extension

intervention and suitable enterprises are necessary to improve their livelihood.

Result and Discussion

An analysis of data given in Table 1 show that there has been an appreciable improvement in the knowledge mean score on all aspects of mushroom cultivation before-and-after the interventions (From March 2006 to April 2006). Similarly, the 't' values show that all the practices of mushroom cultivation were highly significant at 1 per cent level of probability. This confirms the effectiveness of interventions carried out regarding the mushroom cultivation for the respondents. It implies that a balanced combination of extension interventions and constant follow-up would help the respondent to retain the information and utilise it for their betterment. Moreover, mushroom cultivation involves simple technologies which can be easily understood by the respondents.

Table 1 : Gain in knowledge by the respondents on mushroom cultivation

(N = 80)

| S.No. | Practice | Pre -exposure | Post-exposure | Gain in knowledge | 't' value |
|-------|----------------------------|---------------|---------------|-------------------|-----------|
| | | | | | |
| 1. | Varieties / strains | 0.125 | 0.750 | 0.625 | 2.666** |
| 2. | Time of cultivation | 0.100 | 0.975 | 0.875 | 3.055** |
| 3. | Use of agricultural wastes | 0.275 | 0.938 | 0.663 | 2.787** |
| 4. | Substrate preparation | 0.050 | 1.000 | 0.950 | 5.841** |
| 5. | Time of harvest | 0.125 | 1.000 | 0.875 | 4.604** |
| 6. | Method of harvesting | 0.075 | 1.000 | 0.925 | 3.179* |
| 7. | Status of maturity | 0 | 0.938 | 0.938 | 2.678** |
| 8. | Packing | 0 | 0.875 | 0.875 | 3.172** |
| 9. | Value addition | 0.025 | 0.650 | 0.625 | 3.924** |
| 10. | Reuse of substrate | 0 | 0.875 | 0.875 | 3.475** |

** Significant at 1 per cent level.

* Significant at 5 per cent level.

Economics of Mushroom Cultivation : It is evident from the data given in Table 2 that the mushroom cultivation is remunerative. The average yield of mushroom per spawn pocket ranged from 0.90 kg to 1.10 kg. The yield is maximum in Mandya district (1.10 kg), followed by the yields in Hassan (1.0 kg), Tumkur (0.95 kg) and Shimoga (0.90 kg) districts. The total cost of production in each of these four districts are: Rs.13.50 in Shimoga, Rs.13.80 in Mandya, Rs.15.40 in Tumkur and Rs. 18.50 in Hassan. The net returns range from Rs. 21.50 to Rs. 38.20 with a good return per rupee invested (Rs.4.15 in Mandya, Rs. 3.20 in Shimoga, Rs. 2.65 in Tumkur and Rs.2.15 in Hassan districts). The economics of mushroom cultivation reveals that

mushroom cultivation is highly profitable and cost-effective. It does not require much investment by the cultivators since they are using these available wastes free of cost except spawn cost, which varies depending on the place of production. The possible reasons for this may be effective use of the available space in their respective houses and sharing this space with few members of the group. The difference with regard to the yields may be due to the different substrates and management practices. These findings are in line with the study conducted by Lalitha (1996) reporting that mushroom cultivation is profitable and the cultivators got Rs.60 for 2 kg of mushroom produced leading to a profit of Rs.45.

Table 2 : Economics of mushroom cultivation using different substrates after validation

| S.No. | District | Substrate | Cost of one spawn pocket (Rs.) | Average yield (kg/ spawn) | Sale price (Rs./ kg) | Total returns (Rs.) | Labour charge (Rs.) | Total cost (Rs.) | Net returns (Rs.) | Return per rupee (Rs.) |
|-------|----------|-------------------------------------|--------------------------------|---------------------------|----------------------|---------------------|---------------------|------------------|-------------------|------------------------|
| 1. | Mandya | Sugarcane trash | 6.00 | 1.10 | 52.00 | 57.20 | 7.80 | 13.80 | 38.20 | 4.15 |
| 2. | Shimoga | Areca husk | 6.00 | 0.90 | 48.00 | 43.20 | 7.50 | 13.50 | 34.50 | 3.20 |
| 3. | Tumkur | Coir pith + paddy straw (50 : 50) | 6.00 | 0.95 | 43.00 | 40.85 | 9.40 | 15.40 | 27.60 | 2.65 |
| 4. | Hassan | Coffee husk + paddy straw (50 : 50) | 6.00 | 1.00 | 40.00 | 40.00 | 12.50 | 18.50 | 21.50 | 2.15 |

Marketing Channels of Mushroom Cultivation: The respondents sold the mushroom whatever left over after their families consumption. It could be inferred from Table 3 that majority of the respondents (80 per cent in Shimoga and 70 per cent in Hassan) sold their

produce locally in all the districts except Tumkur and Mandya. Whereas in respect of Mandya and Tumkur, the local sales were 40 and 30 per cent, respectively since they sold major portion of their produce at cities close to these villages. Next channel used to sell the mushroom was nearby

town / city except in case of Hassan district, because of the long walkable distance from respondents' villages to the town. The produce was sold through HOPCOMS (Horticulture Producers Cooperative Marketing Societies) in Mandya and Tumkur districts, due to the existence of their outlets. A unique feature of marketing of

mushroom was through SHG stalls in Hassan district, followed by weekly Shandy being nearer to the village. It seems that there is wide scope for marketing mushrooms through SHG stalls and agencies like HOPCOMS, where the producers can get competitive price and avoid middlemen.

Table 3 : Marketing channels of mushroom cultivation and quantity of mushroom sold through each marketing channel

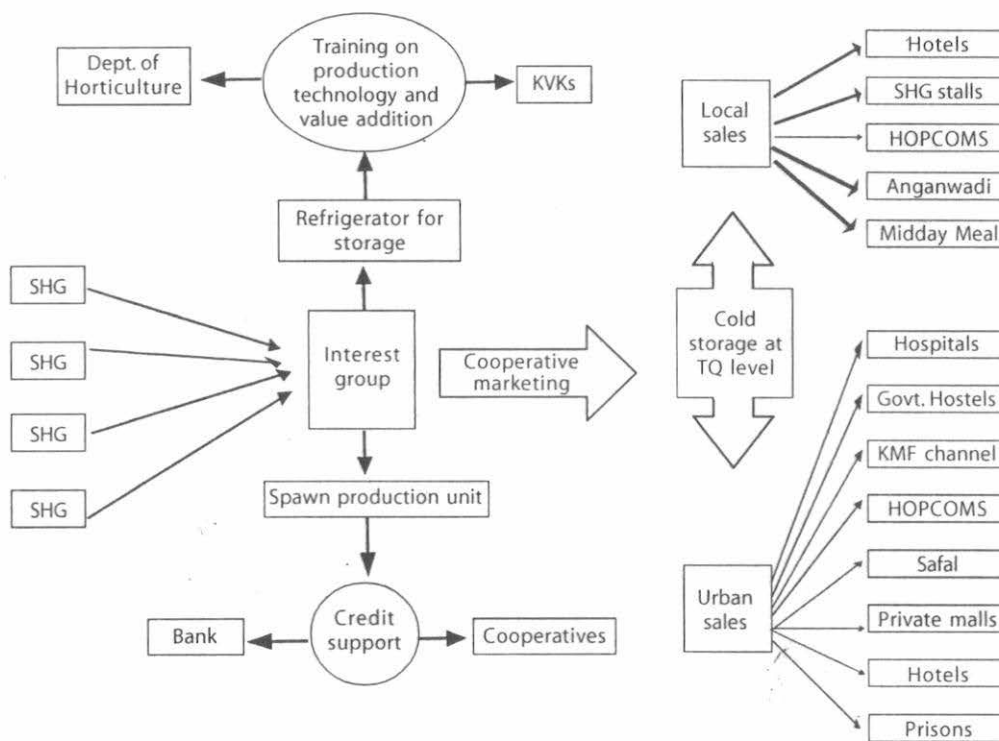
(N = 8)

| S.No. | Particulars | Quantity of mushroom sold (%) | | | |
|-------|--------------------|-------------------------------|---------|--------|--------|
| | | Mandya | Shimoga | Tumkur | Hassan |
| 1. | Local sales | 40 | 80 | 30 | 70 |
| 2. | Shandy | — | — | — | 20 |
| 3. | Nearby town / city | 25 | 10 | 20 | — |
| 4. | Hotels | 15 | 10 | 40 | — |
| 5. | HOPCOMS | 20 | — | 10 | — |
| 6. | SHG stall | — | — | — | 10 |

Note : The figures mentioned are exclusive of the family consumption of the respondents.

Model Market Network for Mushroom : A model market network for mushroom is suggested as depicted in Fig. 1 with the aim to obtain more profit to the mushroom producers. A meticulous look at this Figure 1 would explain that, at the interest group level, there should be a refrigerator for storage purpose locally and a small scale spawn production unit. Periodic training programmes may be organised by the State Department of Agriculture / Horticulture and the respective Krishi Vigyan Kendra's (KVKs). These programmes may include subjects such as cultivation aspects, post-harvest technologies, processing and value addition. Arrangements may also be made through cooperative societies and other banking institutions for providing adequate credit facilities to the SC/ST women for mushroom cultivation with easy and simple procedural formalities and without security, as they are economically weaker and socially backward.

There is a possibility of widespread mushroom production, provided necessary infrastructure and credit facilities are made available. At this juncture, efforts should be made to establish a cold storage facility at the nearest taluk headquarters (TQ) to increase the shelf life of the product and avoid its perishability. As was clearly observed from the study, there are two types of sales: local sales and marketing through nearby markets, hotels, shandies, HOPCOMS and SHG stalls. These results are in line with the findings of Chhabra (1987) who suggested the need for intervention of central agencies like NAFED, NDDDB for proper marketing of mushroom in Haryana State. Further, it was suggested to include mushroom in the menu of *anganwadies* and midday meal schemes with the twin-objective of enhancing the nutritive value of the food for growing children and providing local market for the produce. Furthermore, urban sales may focus on marketing through existing KMF (Karnataka M

Fig. 1 : Suggested model market network for mushroom

Federation) channels, HOPCOMS outlets, SAFAL markets, star hotels, hospitals, leading private malls, prisons and government hostels, wherever feasible to market the mushroom.

It is hoped that through application of this suggested model marketing network, mushroom cultivation would become more remunerative. It is also expected to improve the socio-economic conditions of the mushroom growing resource poor SC/ST women.

Conclusion

The vulnerability of the resource poor rural women can be reduced by helping them organise and take up group activities, which have to be economically viable. Utilisation of abundantly available agricultural wastes for mushroom cultivation, which would otherwise create environmental problems to the people of same village, would generate additional income to the SC/ST women.

Mushroom cultivation is profitable, provided required capacity building activities at village level, supply of needed seed materials, minimum infrastructure and market facilities are ensured. Majority of the respondents sold their produce locally due to non-availability of storage facilities. Also apart from known marketing outlets other means of marketing need to be explored. Hence, the government must intervene and facilitate marketing through midday meal scheme, government hostels and prisons. It may help both ways: providing nutritive food to the people and developing local market for the mushroom produced by the poor SC/ST women.

At macro level marketing can also be linked to the KMF and HOPCOM chains so as to get regular supply and assured market to the mushroom producers. Through these measures it is possible to attract and motivate other rural women to take up mushroom enterprise as a

collective venture for their sustainable livelihood. Efforts are also required to educate the people regarding nutritive and medicinal value of this crop for wider market network and social acceptance. Further, similar enterprises can also be tried at SHGs level to strengthen the vulnerable groups to become socially and economically vibrant.

References

1. Anonymous, 2007, Fully Revised Estimates of Principal Crops in Karnataka for the Year 2006-07, Directorate of Economics and Statistics, Government of Karnataka, Bangalore.
2. Chhabra, N N, 1987, Mushroom Boosts Farmer's Income, *Kissan World*, 14 (8):36.
3. Lalitha, K C, 1996, Mushroom Cultivation: A Profitable Employment, *Meti Vidhye*, 2 (2/3): 28-29.
4. Madan, R L and Thakur, D P, 1991, Cultivation of Oyster Mushroom in Haryana, *Haryana Farming*, (2):1.