



RESEARCH ARTICLE

Empowerment of Rural Women through Entrepreneurship Development Training – The Case of Bio-Waste Management in Southern Tamil Nadu

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ABSTRACT

Madurai and Virudhunagar Districts of Tamil Nadu is blessed with vast resource potentials especially of soil and water which had motivated the farming community to adopt different seasonal and perennial crops like vegetables, cereals, pulses, and fruits. After the harvest of farm produce, the residues are left unutilized and go waste and sometimes add to production problems. A project was aimed to find the means of effectively utilizing the biowaste resources into the value-added products like Organic Manure, Cultivation of Milky Mushroom and Biopesticide Production etc. These practices are successful and hence it is planned to impart capacity building programs to empower the landless, marginal Rural Scheduled Caste and Scheduled Tribe Women are hailing in the poverty line. Accordingly, one hundred beneficiary women were identified and selected for capacity building and guided them to establish value-added products like Milky Mushroom from the biowaste resources. During the training and demonstration programs, the method of erection of mushroom shed, cultivation of milky mushroom, methods of spawn production, bed preparation utilizing the waste resources, harvesting and marketing of mushroom to the beneficiaries through identified experts in the related field. Though all the respondents were actively participated in Bio degradation, Bio Pesticide, and Milky Mushroom production activities, the impact created in the study area were found to be only to the level of 45 per cent whom had shown much interest in establishing Milky Mushroom and the Spawn Production activities and started earning considerable income per month motivated them to run quality life in their environs. Besides, the details of activities performed by the respondents and their enhancement in earning capacity and the marketing practices followed are also discussed in this paper.

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Madurai and Virudhunagar Districts of Tamil Nadu is blessed with vast resource potentials especially of soil and water which had motivated the farming community to adopt different seasonal and perennial crops like vegetables, cereals, pulses, and fruits. After the harvest of farm produce, the residues are left unutilized and go waste and sometimes add to production problems like choking of canals and waterways. It is mainly due to the absence of manpower, take it easy approach with the farmers and lack of awareness on the technology of effective usage of biowastes.

Organic waste management is possible through cultivation of milky mushroom will go a long way in harnessing the available agricultural waste materials, lesser use of plant protection chemicals, and

sustenance of subsidiary food fungi (mushroom). The technologies for biowaste management is transferred to the farming community through capacity building programs will help in increasing awareness among the farming community on health, environment, and ecological balance besides conserving and recycling of agricultural wastes. Utilization of locally available agricultural waste materials for making manure by utilizing spawn, production of milky mushroom and formulating bio-pesticides not only creates employment opportunities but also builds confidence among the farmers. The efficiency of conversion of biowaste resources helps in income generation, and eco-friendly management of crop diseases will sustain a healthy environment. If the benefit accrues, the target group or unemployed may find livelihood and become self employed thereby

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enhancing their economic status. Therefore the cycle of sustainability of improved technology and employment generation will create further social and economic development in this region.

Though the Technologies were available to utilize the bio wastes, the transfer of technology to spread the same to the farming community for effective and efficient use is dismal. An institutional approach is needed to link the research lab and the farm front through appropriate capacity building programs so as to empower the rural poor which in turn enhance their entrepreneurial capabilities and hence a study has been proposed in Southern Part of Tamil Nadu with the funding support from Department of Science and Technology, Government of India with the specific objectives viz., to expose the unemployed SC/ST women on the demonstration and training on the technologies which are effective in Bio Waste Management, to infuse methods of commercializing the product generated from the Technology used for Bio Waste Management and to motivate and guide the trainees to establish micro level enterprises on bio waste management

MATERIAL AND METHODS

In Southern Tamil Nadu, the district in which the Agricultural College and Research Institute is located in Madurai and the adjacent district is the Virudhunagar District in which the Scheduled Caste and Scheduled Tribe Women were very meager and put to lot of pressure both socially and economically and hence the rural Scheduled Caste and Scheduled Tribe women were the respondents aimed at for this project and hence the Madurai and Virudhunagar Districts were purposively chosen to implement the project in the First Stage.

The list of SC/ST women were obtained from the Department of Agriculture and Department of Economics and Statistics, Government of Tamil Nadu in Madurai and Virudhunagar districts. From the list, the villages in which higher number of Scheduled Caste and Scheduled Tribe women available were selected in the Second Stage.

The Selected villages in the second stage were Pudutamaraipatty, Thirumalnatham of Madurai District and Sithumoondraippu and Chinnapparettiapatty of Virudhunagar districts. From each village, 25 participants were chosen as beneficiaries and thus, a total number of 100 beneficiaries were selected from the above villages in the Third Stage following a Three Stage Random Sampling Technique. The details of selected samples are delineated in Table 1.

The respondents were invited the opinion on the sustainability of the project by inviting responses for each questions delineated in the Table 1 and the

number of persons revealing the word 'Yes' and 'No' were taken to stock and the same were analyzed using the percentage analysis. Besides, to know the socio economic features of the respondents a brief questionnaire is also designed to record their demographic profile, status of women employment, present earning strength per month and the extent of awareness on the selected technology to which the training is proposed. The details were analyzed both pre training and post training situations and follow up to assess the impact of training imparted in the project.

To assess the socio-economic profile of the selected respondents, the income classification is made on the basis of Minimum income obtained by the individual respondent and the Maximum income obtained were compared and the four-class interval were arrived using Rs 3000 as the interval between the groups following the lower-income category earnings as the base. The number of respondents in each interval is assessed and reported in the analysis. Similar methodology has been adopted by Sheela Margaret during the year 2013. However, the results were not discussed on the basis of the income group but only on the basis of the number of respondents reported in different characteristics. Because the study is mainly aimed at imparting the training and its focus is to identify the impact created among the respondents.

Among the three objectives enshrined in the project, only the first and third objectives were fulfilled from the project effectively and the details of the findings related to the abovementioned objectives were presented in the Results and Discussion section. The second objective was fulfilled by making tie-ups with fruits and vegetable centres, pazhamudhir nilayams and the groceries shops in the neighboring towns. It will be discussed separately.

RESULTS AND DISCUSSION

Farm Mechanization and Modernization has resulted in the accrual of Bio Wastes both at the production and processing sites. Bio-Waste is a potential resource if it is value-added properly.

Table 1. Details of Samples Selected in the Study Area

Block	Village	Total Number of Beneficiaries
Madurai North	Puthuthamaaraipatty	25
Cholavandan	Thirumal natham	25
Kariyapatti	Sithumoondaraippu	25
Senkundrum	Chinnapparettiapatty	25

Most of the resource is left uncared and unutilized because of lack of awareness on the potentials of

best utilization. If the farmers particularly the downtrodden women were offered with suitable training and capacity building programs, the

biowaste resources could be best utilized to realize its fullest potential. On these lines, the training were given to the respondents on the following themes.

Table 2. Sustainability Aspects of the Project at Planning Level

1. Relevancy	Yes	No	Not Sure
Is the Project consistent with National Priority			
Is the Project consistent with Provincial / District Priority			
Is the Project consistent with the Sectoral Priority			
2. Acceptability			
Has the community been consulted regarding acceptability			
Has the project identified / defined clearly the targeted beneficiaries			
Does the community consider the project as beneficial			
Will the project disadvantage/discriminate any particular group			
Have the local elected representatives/community leaders been consulted and agreement obtained			
Have the local elected representatives / community leaders endorsed the project			
Have the implementation agencies been consulted and agreement obtained			
Have the capacity of the implementation agency / agencies been assessed			
Has the implementation agency / agencies got the necessary resources, logistics (trained manpower, vehicles etc) to implement the project.			
3. Economic / Financial Viability			
Would the post-implementation project operations be implemented without subsidy			
Are the project benefits greater than the project costs			
Will the project services be given free, continuously			
Is there a cost-recovery plan			
Will there be sufficient funds available to implement the project			
4. Environmental sustainability			
4.1.Is the project environmentally sustainable?			
5. Implementation and monitoring strategy			
Has the project developed an implementation plan with clearly defined goals and responsibilities			
Has the project developed monitoring and evaluation plan			
Has the project developed all the success indicators (Financial, Physical and its Impact)			
Has the project identified various levels of review mechanisms for monitoring the progress			
6.Operation and Maintenance (O & M)			
Has the project clearly delineated the responsibility of operation and maintenance			
Whether budgetary provisions have been made for Operations and Maintenance			
<ul style="list-style-type: none"> • Production of Milky Mushrooms by Utilizing the Bio Waste Resources • Production of Bio Pesticides • Degradation of Bio Wastes and Its Management for value addition <p>These training are offered to the selected Scheduled Caste, and Scheduled Tribe Women respondents in Madurai and Virudhunagar Districts and hence the results are analyzed and presented under the following headings.</p>	<ul style="list-style-type: none"> • Socio-Economic Profile of Selected Respondents • Details of Training and Technologies Imparted to the Trainees • Sustainability Aspects of the Bio-Waste Management Project • Perception of the Sample Respondents about the Training • Impact of the Training Programs offered 		

Table 3. Details of Scheduled Caste and Scheduled Tribe Population in the Study Area

Particulars of the District	Units	Madurai District	Virudhunagar District	Total
Male Population	Lakhs	13.00	08.70	21.70
Female Population	Lakhs	12.80	08.81	21.61
Total	Lakhs	25.80	17.51	43.31
SC / ST Women Population	Lakhs	02.52	02.04	04.56
SC / ST Women Population	Percent to Rural	19.70	23.10	21.40

Socio Economic Profile of the Selected Respondents

Before discussing the socio-economic profile of the selected respondents, it is important to discuss the population and its related details as the respondents belonged to Scheduled Caste and Scheduled Tribe Women. The details of those are analyzed, and the results are presented in Table 3.

Table 4. Socio Economic Profile of Selected Trainees for the Training Program

Variables	Particulars	No. of Respondents	Percentage to Total
Age	Below 20	10	10.00
	20 – 30	46	46.00
	31 – 40	32	32.00
	41 and Above	12	12.00
		100	100.00
Marital Status	Unmarried	07	07.00
	Married	72	72.00
	Widow	09	09.00
	Divorce and Separated	12	12.00
		100	100.00
Place of Living	Rural	61	61.00
	Semi Urban	23	23.00
	Urban	16	16.00
		100	100.00
Educational Status	Illiterate	24	24.00
	Primary	18	18.00
	Secondary	27	27.00
	Higher Secondary	23	23.00
	Collegiate	08	08.00
		100	100.00
Occupational Status	Wage Labor	52	52.00
	Private Employee	21	21.00
	Govt. Employee	02	02.00
	Business	14	14.00
	Others	11	11.00
		100	100.00
Monthly Income	< Rs 3000.00	48	48.00
	3001 – 6000	23	23.00
	6001 – 9000	08	08.00
	9001 – 12000	12	12.00
	More Than 12000	09	09.00
		100	100.00
Practice of savings	Practiced	34	34.00
	Not Practiced	66	66.00
Total		100	100.00

Table 3 revealed that the population of Madurai district is 25.80 lakhs of which 13 lakhs are males and 12.80 lakhs are females. About 44 per cent of the population of the district lives in rural areas. The sex distribution of the population shows that 5.70 lakhs are males and 5.60 lakhs are female in rural areas. The proportion of SC and ST population is 12.70 per cent and 6.90 per cent of the urban and 19.70 per cent of the rural population belongs to SC/ST category.

The population of Virudhunagar is 17.51 lakhs with 8.70 lakh males and 8.81 lakh females. The total Virudhunagar district population living in rural areas is 9.63 lakhs of which males and females are 4.80 and 4.83 lakhs respectively. In this district, the people of rural areas belong to Backward Class (BC), Most Backward Class (MBC) and SC/ST. Majority of them are in MBC and BC categories. Only 23.10 per cent fall in SC/ST category. In the sample districts as a whole, the Scheduled Caste and Scheduled Tribe Women population are accounted for 21.40 per cent to the total. Now let us analyze the socio-economic profile of the selected trainees who are invited for the training program on biowaste management and their details are analyzed, and the results are presented in Table 4.

The Word 'Empowerment' means giving Power. According to International Encyclopedia (1999), power means having the capacity and the means to direct one's life towards the desired social, political and economic goals or status. Empowerment provides greater access to knowledge and resources, more autonomy in decision making, greater ability to plan lives, more control over the circumstances which influence lives, and freedom from customs, beliefs and practices (Uma Narang, 2012).

The training program on bio waste utilization has given way for empowerment to the SC/ST women or not is to be examined in this section. Under the head of socio economic profile, the variables like age, marital status, place of living, educational status, occupational status, monthly income earned and the practice of savings in vogue among the trainees during the pre implementation of training programs were analyzed and reported in Table 4.

Among the Socio economic variables included,

Table 5. Details of Training and Demonstrations Conducted in the Study Environment

Block	Village	Total Number of Trainees	Period of Training	No. of Days
Madurai North	Puthuthamaaraipatty	25	23.01.12 to 28.01.12	06
Cholavandan	Thirumalnatham	25	06.02.12 to 09.02.12	04
Kariyapatti	Sithumoondaraippu	25	20.02.12 to 24.02.12	05
Senkundrum	Chinnapparettiappatty	25	05.03.12 to 09.03.12	05
		100		20

the age classification is adopted based on the methodology practiced by Sheela Margaret during the year 2013. In that the author has given fivefold classification in age with an interval of 5 years.

Table 6. Details of Field Day cum Demonstration Conducted for the Trainees

Date	Place in which Conducted	Name and Type of Program
19.03.2012	Bio-control Lab, Department of Plant Pathology, AC &RI, Madurai	Field day on Mass Production of Bio-Pesticides
20.03.2012	Central Farm, AC &RI, Madurai	Demonstration on Seed Treatment with Bio-Pesticides
21.03.2012	Mushroom Unit, Department of Plant Pathology, AC &RI, Madurai	Demonstration on Production of Milky Mushroom using Bio Wastes
22.03.2012	Wetland, AC &RI, Madurai	Field Day on application of Bio-Pesticides
23.03.2012	Compost Yard Unit, Department of Plant Pathology, AC &RI, Madurai	Demonstration on Decomposing of Coirpith and other Bio Wastes

In this study, the classification is slightly modified because of the unmarried classes were in the age group of less than 20 years and hence the above classification is presented in Table 4.

Table 7. Sustainability of Project at the Implementation Stage

Dimensions	Indicators	Sustainability Status*	
		Target	Achievement
Economic	Success Rate of the Project	2 to 3	02.38
Community	Proportion of Community Participation	10 Per Cent	78 Per Cent
	Local Leader Support	Cordial	Cordial
Equity	Pattern of distribution of project target benefits, by income	Not mentioned	Not followed
	Pattern of distribution of project target benefits, by gender	Yes mentioned	Female alone were Selected
	Pattern of distribution of project target benefits by groupings	Small to Medium farmers	Spread of Different Category is visible
	Pattern of distribution of project target benefits by caste	Not Mentioned	Only SC/ST were Selected and Made to be benefitted
Operation and Maintenance	Condition of Facilities Provided	Good	Moderately Good
	Operating budget	Sufficient	Sufficient
	Cost recovery (% targeted for recovery)	Nil	Does Not Arise
Environmental	Positive / Negative Impacts	Less soil degradation, Use of Organic Biocides and Mushroom as Protein supplement	Soil fertility status improved by using degraded waste and disease can be managed by biocide application and yield increased. Protein supplement by Taking Mushroom

(* Indicates that the results are based on the Opinion Survey of the Respondents)

It revealed that 46 per cent of the respondents were in the age group of 20 to 30 followed by 32 per cent of the respondents were in the age group of 31 to 40 years. According to Nataraju (2013), 40 per cent of the women respondents were in the age group of 41-50 years. In Toto, 78 per cent of the respondents invited for the training were in the age group of 21 to 40 years. Only 10 per cent of the respondents were in the age group of less than 20 years. It revealed that the experience of the respondents could motivate the respondents to establish business units at household level after completing the program.

The second variable in the socio-economic profile is the marital status of the trainees. It is also essential in this study as the respondents would have had multiple commitments to the family might force them to attend the training so as to establish business unit at household level. Here, in the analysis, 72 per cent of the respondents were married women involved with commitments could motivate them to establish business units.

The third variable included in the socio-economic profile is Place of living viz., rural, semi-urban and urban. Among the regions, 61 per cent of the respondents were living in the rural areas followed by 23 per cent of the respondents hailing from semi-urban and only 16 per cent of the respondents from the urban environment. The respondents from urban were having the residence mostly in the nearby villages and their business related dealings are in the urban zone.

The fourth variable included in the socio-economic profile is the Educational Status of the respondents. On assessing the educational status, 27 per cent of the respondents hold Secondary education followed by Higher Secondary Education with 23 per cent of the respondents. Illiterate in the sample lot is found to be accounted for 24 per cent to the total respondents. Collegiate education was held by only 8 per cent of the respondents. From this one could understand that the respondents were having educational background that are accounted for 76 per cent in Toto having the scope of establishing the business units either in mushroom production and or in Bio-Waste decomposition to develop the compost manure.

With regard to the occupational status of the respondents selected, wage labor found to be dominant that are accounted for 52 per cent followed by private employment and business both are respectively accounted for 21 per cent and 14 per cent to the total. The respondents with other sources of income are accounted only for 21 per cent.

In respect of the variable monthly income, the minimum income earned per month is arrived at Rs 3000 which is accounted for in 48 per cent of the respondents. The income range of Rs 3001 to Rs 6000 earned by 23 per cent of the respondents followed by 12 per cent of the respondents were holding the monthly income in the range of Rs 9001 to 12000. More than Rs 12000 income is prevalent only among the 12 per cent of the respondents. In general, 71 per cent of the respondents were earning only less than 6000 as their monthly income from wage labor and private employment.

Absence of income-generating opportunities to the common public is very poor and hence poor wages and poor opportunities for employment to the labor force in the study environment. These have influenced only 34 per cent of the respondents to inculcate the saving attitude from their monthly income, and the 66 per cent of the respondents were reluctant to save due to subsistence income generated from different sources and they live in the level of poverty. Hence imparting the training to the respondents would have a motivational function among them to earn further.

Details of Trainings and Technologies Imparted to the Trainees

Technologies Offered to the Trainees

Three technologies viz., cultivation of milky mushroom, mass production of *Trichoderma viride* and *Pseudomonas fluorescens* and agricultural waste degradation have already been developed by Tamil Nadu Agricultural University, Coimbatore was imparted to the trainees selected from the Madurai

and Virudhunagar districts. The details of trainees, a period of training conducted are delineated in Table 5. Before discussing the details delineated in Table 5, it is essential to highlight the nature and type of technologies transferred to the trainees.

Technology 1 - Mass Production of *Trichoderma viride*

Molasses Yeast medium (Molasses 30g + Yeast 5g + Water 1000ml) is prepared in conical flasks and sterilized at 1.1 kg/cm² for 20 minutes. *T.viride* culture is inoculated by taking a fungal disc from 10 day old culture and incubated for 10 days. This serves as mother culture. Molasses yeast medium is prepared in a fermentor and sterilized. Then, the mother culture is added to the fermentor @ 1.5 litre/50 litres of medium and incubated at room temperature for 10 days. The fungal biomass and broth are mixed with talc powder at 1:2 ratios. The mixture is air dried and mixed with carboxyl methylcellulose (CMC) @ 5g / kg of the product. It is packed in polythene bag and used within 4 months. It is one of the components of training (Das et. al. 1997).

Technology 1 - Mass Production of *P.fluorescens*

P.fluorescens is multiplied in sterilized Kings 'B' broth for 48 hours. The pH of the substrate (Peat soil or talc powder) is adjusted to 7 by adding calcium carbonate @150 g / kg. The substrate is then sterilized at 1.1 kg/cm² pressure for 30 minutes for two successive days. Four hundred ml of *P.fluorescens* suspension is added to 1 kg of the substrate containing 5 g of carboxyl methylcellulose and mixed well. The formulation is packed in a polythene bag and can be stored for one month. It is another component under the Technology- 1 offered to the trainees (Dutly et.al. 1999).

Technology 2 - Bio Waste Degradation

A bulk quantity of agricultural waste viz., millets crop residue, cotton waste, coir waste approximately one ton of waste is arranged in ten layers i.e. sandwich technique in which one layer of waste of 100 kg sprinkled with 250 g of *Pleurotus* spawn, followed by 100 kg of agricultural waste and sprinkled with 1 kg of urea.

This procedure is repeated for 10 layers of waste so that, 5 layers have spawn and another 5 layers have urea. The degradation is done in aerobic condition. Watering is be done regularly twice a day to maintain 50 -60 per cent moisture level. After 30 days, turning is to be given to maintain uniform degradation. After 45 days of composting, agricultural waste is ready as organic manure. It is also one of the component of training offered to the trainees (Theradi Mani et.al. 1992).

Technology 3 – Production of Milky Mushroom

Milky mushroom can be cultivated on a wide range of cellulosic substrates namely, paddy straw, maize stalks, sorghum stalks, pearl millet stalks, Palmarosa grass, Vetiver grass, sugarcane bagasse, soybean hay, groundnut haulms, etc., Mushroom preparation is done in polythene bags system of 60 X 30 cm size by sandwich technique i.e. rice straw followed by spawn. The beds are then incubated for spawn run under semi-dark condition in a cleanroom. Spawn run will be completed in 10-12 days. After completion of spawn run, the casing is done by cutting bed into horizontally and beds after casing are kept in cultivation chambers. After casing, the beds are to be incubated over racks in partially sunken chamber lined with Blue colored HDP sheet as roofing material. Inside the chamber the temperature should be around 30-35°C and RH >85%. The light intensity of about 1600-3200 lux is essential in the cropping room.

The water should be sprayed regularly to maintain the 50-60 per cent moisture content in the casing medium. Pinheads appear in 8-10 days after casing and the first harvest can be made in 6-8 days after pinhead formation. Mushrooms should be harvested before they start shedding the spores. It is also one of the components of training offered to the trainees selected from different locale (Theradi Mani et.al. 2001, Krishnamoorthy et al. 2016).

Table 5 revealed that the Puthuthamaraipatty village in which the training was conducted for a period of 6 days during the month of January 2012 and the Thirumalnatham village in which the training conducted was only four days. In toto, the Madurai District villages in which the training conducted was accounted for 10 days incorporating all the technical components delineated in Technology – 1, 2 and 3.

In Virudhunagar District, the villages in which the training conducted were Sithumoonradaippu and Chinnapparettiapatty during the months of February and March 2012. The number of days took to conduct the training component in each village is accounted to be 5 days. Conduct of training alone to the respondents is not going to pay a dividend. However, the impact of the conduct of training is equally important. The impact of the training could better be visualized through the demonstration of each technology package. In this respect, the details of the technologies demonstrated are delineated in Table 6.

Table 6 revealed that the demonstrations were conducted during the month of March 2012. The Field Day on Mass Production of Bio Pesticides was conducted on 19th March 2012 at the BioControl Lab of Agricultural College and Research Institute, Madurai. The produced biopesticides and its

application for seed treatment were demonstrated on 20th March 2012 at the Central Farm of Agricultural College, Madurai.

The demonstration on Production of Milky mushrooms by utilizing the Bio Wastes was conducted on 21st March 2012 at the Mushroom Production Unit and the Demonstration of Decomposition of Coirpith and other Bio Wastes was conducted at Compost Yard of Agricultural College and Research Institute, Madurai. The very purpose of conducting the demonstration is to infuse the ideas and to train them in the practice of technology to develop the hands on experience to the trainees.

Sustainability Aspects of the Project at the Implementation Stage

The project sustainability at the implementation stage was assessed by incorporating the following dimensions viz., Economic Dimensions, Community Participation, Equity Distribution, Operation and Maintenance, and Environmental Dimensions. The project has set the targets in each dimension, and hence these details are analyzed and documented in Table 7.

Table 7 revealed that the rate of return under the economic dimension is fixed as 2 to 3. However, the project has realized the return to the tune of 2.38 revealed that the return realizable is 2 times more than the investment. With regard to the Community Participation, the target fixed is 10 per cent. But, the project has realized the participation to the tune of 78 per cent. According to Asha Sharma (2011), increase of outreach to the poor and marginalized state of the society had high work participation for marginalized groups like SC/ST (54 per Cent) and Women 48 Per Cent. Nataraju et.al. (2013) reported that the women participation in the training programs were accounted to be of 55 per cent. In terms of Equity, different size class of farm households was participated and enriched the program.

The environmental dimension was Soil fertility status improved by using the degraded waste and disease can be managed with biopesticides application and yield increase is visualized. Another aspect is utilizing the biowaste resources, the production technology of mushrooms and biopesticides were demonstrated and the value addition of waste is visualized. In this respect, analyzing the opinion of the respondents about the training programs is imperative.

Perception of the Sample Respondents about the Training Program

The training program was conducted to the respondents on three major technology components which are delineated elsewhere. However, imparting

the opinion of the participants is equally important with respect to the parameters enunciated on sustainability aspects of the project at the planning stage to know the success rate of the project and hence the opinion are analyzed and reported in Table 8.

Table 8. Opinion of the Sample Respondents about the Training Program

Parameters	Number of Respondents Reported		
	Yes	No	Not Sure
Project is Relevant to National and Regional Priority	100	00	00
Acceptability of the Technical Training Components	60	40	00
Economic Viability of the Project	90	00	10
Environmental Sustainability	100	00	00
Implementation and Monitoring Mechanism	70	20	10
Operation and Maintenance	80	10	10
Follow up Mechanism and Feed Back	45	20	35
	78	13	09

Table 8 revealed that Cent per cent of the respondents have indicated that the project is relevant to National and Regional Priorities. With respect to the acceptability of the Technical Training components, only 60 per cent of the respondents has revealed that the components are acceptable to them and 40 per cent were reported that the components are not acceptable.

With regard to the economic viability of the project 90 per cent of the respondents have revealed that the project is a viable one as it could generate considerable income increase on the adoption of those practices and 10 per cent of the respondents have highlighted that it is not sure that the project is economically a viable one. In respect of environmental sustainability, cent per cent of the respondents have uttered that the project could meet all the environmental requirements because it decomposes the waste into value-added manure and at the same time the waste was value added with TNAU technologies.

In respect of implementation and monitoring mechanism, 70 per cent of the respondents revealed that the monitoring and implementation mechanism is acceptable to them and 20 per cent of the respondents revealed that the monitoring system is not much convincing to them and 10 per cent of the respondents revealed that they are not sure about the monitoring mechanism which was practiced by the project team.

With regard to the operation and maintenance aspects of the project, 80 per cent of the respondents have highlighted that the operation aspects was quite acceptable to them and the remaining 10 per cent of the respondents said No comments with

respect to operation and maintenance aspects and another 10 per cent of the respondents revealed that they are not sure about the operational aspects of the project.

On an average 78 per cent of the respondents have revealed that the parameters included in the project is acceptable to them and 13 per cent of the respondents revealed that the parameters delineated are not acceptable to them and only 9 per cent of the respondents highlighted that they are not sure enough to comment on the overall aspects of the project implementation. In a nutshell, the project implemented by the Project Team is found to be a successful one.

Impact of the Training Programs Offered

Training conducted to the respondents would have motivated few to take up business venture on a small level or at the household level. The impacts so created were analyzed and the results are presented in Table 9. Table 9 revealed that the monitoring mechanism practiced in the project motivated 76 per cent of the respondents in to enhance their Awareness related participation with the Technical persons of Tamil Nadu Agricultural University and often clearing their doubts in the biowaste utilization for value addition.

Table 9. Details of Socio-Economic Changes Made during Post Training Program

Socio Economic Changes	No. of Respondents	Percentage to Total
Mushroom Production Unit Established	56	56.00
Degradation of Bio-Waste and Compost Unit Established	34	34.00
Improvements Made in the Existing House	14	14.00
Purchase of New Consumer Durables	29	29.00
Enhancement in the Awareness Related Participation with the Technical Persons of TNAU	76	76.00
Increased Investments Made in the Production of Mushroom Unit	42	42.00
	42	41.83

The number of Mushroom Production units established by the respondents in the Madurai and Virudhunagar Districts arrived at 56 per cent to the total respondents. Among the 56 Mushroom Production Units established, 42 units have expanded their operation because of good demand for the output produced and higher income generation becomes possible. Due to that, the improvements made in the existing house was carried out by 14 per cent of the respondents. At the same time, the purchase of new consumer durables likes two-wheelers etc also visible among the 29 per cent of the sample respondents. All is possible due to the enhancement in the income because of the training program conducted through the project.

The Compost manufacturing unit established by the respondents by utilizing the biowaste is

accounted to be at only 34 per cent to the total due to poor interest in the degradation of biowaste activity among the respondents. However, the project would have motivated the respondents further to take up the degradation activity by highlighting the economic incentives associated with the project and the need for biofertilizers and compost which are dire need of the hour to promote organic agriculture. Mathur (2008) reported that the Scheme entitled “Mahatma Gandhi National Rural Employment

Guarantee Program” act as a great agent of Socio-Economic upliftment and providing livelihood security to the poorest of the poor by providing income-earning opportunity.

As part of the impact analysis, analyzing the perception of the respondents on the components of the training program conducted is also immensely important, and hence the perception of the respondents was analyzed, and the results are presented in Table 10.

Table 10. Perception of the Respondents on the Component of the Training Program

Particulars	Perception of the Trainees (Per Cent)			
	Excellent	Very Good	Good	Satisfactory / Irrelevant
Training on Mushroom Production	81.00	14.00	05.00	00.00
Demonstration on Mushroom Production	74.00	16.00	10.00	00.00
Training on Production of Bio-Pesticides Unit	62.00	27.00	08.00	03.00
Demonstration on Bio-Pesticides	58.00	30.00	09.00	03.00
Degradation of Bio Waste from Agriculture	46.00	32.00	14.00	08.00
Demonstration on Bio Waste Degradation	39.00	34.00	21.00	06.00
	60.00	26.00	11.00	03.00

Table 10 revealed the details of the perception of respondents who had attended the training program. The perception of the respondents was classified as Excellent, Very Good, Good, and Satisfactory technology component. The training on Milky Mushroom Production is ranked as Excellent technical component as perceived by 81 per cent of the respondents followed by Demonstration on Mushroom production technology scored 74 per cent as Excellent.

The training component on Production of Bio Pesticides was ranked as Excellent by only 62 per cent of the respondents. At the same time, 27 per cent of the trainees have reported that the production of biopesticides component was Very Good and only 8 per cent has revealed that the component is Good. Three per cent of the respondents highlighted that the component is satisfactory because it was not much important to those trainees.

The demonstration of Bio Pesticides scored 58 per cent as Excellent and 30 per cent of the respondents revealed that the demonstration is Very Good. Among the components, the Degradation of Bio-Waste from Agriculture and Demonstration on Bio-Waste Degradation scored poor rank. It might be due to the importance and usefulness of the technology would not have delineated to the trainees at the right time. In this respect, the role of Economists is much important to give motivational exercise to the trainees for adoption and getting feedback from the trainees.

In a nutshell, 60 per cent of the respondents have revealed that the technical components imparted through the training program was Excellent while 26 per cent of them said that the components were Very Good and 11 per cent of them exercised their option as Good and three per cent of the respondents were expressed that the components were irrelevant and not much important to them due to their poor understanding. Hence, the project of such type would come forward to promote the benefits realizable from the project in different stages by coining suitable promotion packages. On doing so, the people who are less interested could be motivated to adopt the technology component with full spirit on highlighting the potential benefits that accrue from the project. Much take off is not visible because of some constraints available to the trainees and hence analyzing the details of constraints that de-motivate the trainees are spelt out and are delineated below. They are

- Lack of money and assets for investment decisions among the respondents
- Lack of Marketing Skills to the Trainees

Poor Price Offered for their produce at Doorsteps. These constraints are to be appropriately handled to give a boost to the household enterprises like mushroom production and bio pesticides production activities.

CONCLUSION

Five day trainings and field day cum

demonstration programs on agricultural waste degradation, bio pesticide production and cultivation of milky mushroom were given to 100 women SC/ST beneficiaries of the following villages viz., Puthuthamarai patty, Thirumal natham, Sithumoondraippu and Chinnapparettiapatty in Madurai and Virudhunagar districts. The training given to the respondents has given better results. The success rate of the project is higher than the prescribed one in the project. The impact of the project revealed that the socio-economic changes were visible and the project components were rated as excellent by almost 60 per cent of the respondents.

To redress the constraints, the project authorities would have organized all the trainees into three producer commodity groups or associations and the same would have been registered for tapping the fullest benefits of the Government. In doing so, the collective bargaining power to realize better price for their produce and availing the finance from financial institutions by sending appropriate proposal to establish small business venture at the household level or by the commodity group becomes possible.

The training program if it incorporates Production of output, Marketing practices, and Promotional measures and certification related issue mean, the respondents could develop confidence building further which promotes enhanced production, certification and trade of outputs generated from bio waste resources.

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