CHAPTER 3

METHODOLOGY

Home science research and extension service ought to be family oriented. Therefore an effective Home-Science extension and training service is a crucial element in the process of planning and development.

In recent time the extension training is required to be broad-based and more situation specific. Not only the extension personnel, the homemakers, farmers, labourers, and alike need to be trained adequately in recent technologies. Techniques of Oyster Mushroom Cultivation (OMC) should have to be percolated down word because of its wide adaptability, simple technology, non compatibility with agricultural land, dependence on locally available abundant, cheap raw materials, and recycling agro-waste into nutritious food. Hence this study is an attempt to transfer the oyster mushroom technology through well-structured training programme amongst the community.

This chapter furnishes detail information pertaining to methods used and procedures applied for conducting and evaluating the training in OMC. Efforts have been made to use appropriate research design and standard methodology. The different aspects covered in this chapter have been described under following sub headings.

3.1. Locale of study
3.2. Physical, climatic, demographic, and agricultural background of study area
3.3. Research design
3.4. System approach to training in OMC.
3.5. Pilot study
3.6. Sample and sampling techniques
3.7. Development, pre-testing, and administration of the tools of data collection
3.8. Variables and their measurement
3.9. Statistical analysis.
3.1 Locale of the study

Growing oyster mushroom is a befitting activity for homemakers and an ideal income generating activity for unemployed youth of this region. Hence the present study has been conducted keeping in view the homemakers, un-employed youth and other interested persons in OMC. The training has been conducted at Amravati, City of Maharashtra State.

The training programmes were conducted at the Post Graduate Department of Home Science, Amravati University, Amravati. This venue was purposely selected because of:

- The department has been involved in creating conducive atmosphere for such programmes
- Venue of training has played vital role in creating learning environment
- Availability of required infrastructure for the training
- The venue was convenient for the trainers and trainees

3.2 Physical, Climatic, Demographic, and Agricultural Background of the Study Area

Amravati City is located on the Mumbai–Calcutta National Highway number six. The city lies between east longitude 76.37° to 78.37° and 20.32° to 21.46° north latitude. The climate of the district is subtropical and monsonic type with hot and dry summer followed by rainy and mild winter. The average daily temperature ranges from a minimum of 14.7°C in December-January to maximum of 46.0°C in the month of May. The area receives rainfall from south–west monsoon during June to part of October in a year. The average annual rainfall in the district is about 876.92 mm and the atmospheric humidity ranges from 45-60 percent.

The soil of the district area has in general weathered basalt as parent material. It is mostly whitish black to black in colour and commonly known as black cotton soil. The main source of economic earning activity in the district area is agriculture and the major cash crops are cotton and orange. Predominant crops grown in kharif season are cotton, jawar, soybean, groundnut, and mung, whereas wheat, gram, sunflower, mustard, and vegetables are grown in rabi season.
3.3 Research Design

The research design enables the researcher to answer research questions, objectively, accurately and economically as possible. It sets up the framework for the tests of relations among variables.

In present study, experimental research design is used. Experimental refers to that part of research in which some variables are controlled, some are manipulated and their effects on other variables were observed. Training was evaluated for confirmation of the effects of experimental model (training).

3.4 System Approach To Training In OMC.

Training is the means to bring about a continuous improvement in the quality of work performed by individual. It equips trainees with necessary knowledge, skill, and attitude to perform a job. The System Approach to Training (SAT) is a problem solving process, that places the diagnosis of needs before the prescription of the required methods to achieve needs. It is a discipline that requires, those responsible, for designing and providing the training, that people need to carry out in a series of independent steps in logical sequence (York, 1989).

SAT consist of number of systems, which are logically developed in accordance with extension training policy. The training cycle provides a dynamic framework for training. It has five distinct phases, each phase is linked subsequently with each other and has it's own sub system. 

- Training Need Assessment (TNA)
- Training Plan Development (TPD)
- Design of Training Programme (DTP)
- Training Programme Implementation (TPI)
- Training Monitoring and Evaluation (TME)
Diagram-1: The comprehensive system model of training in OMC.
3.4.1 TRAINING NEED ASSESSMENT (TNA)

TNA is the first and most crucial phase of training cycle as the training approach is built up on it. While assessing training needs, two basic questions are to be considered i.e. (1) who are to be trained, and (2) what are their training needs?

The answer of the first question proclaims about the sample i.e. homemakers and unemployed youth and for seeking answer of the second question following procedure was applied.

The training needs of the sample was operationally defined as level of training needs expressed by the respondents as well as needs of the training institution. The important areas were selected in consultation with subject experts in oyster mushroom. To assess the training needs of the sample, 100 respondents residing in study area were selected randomly from above said categories. The three point rating scale was developed to obtain responses. The responses were quantified for frequencies, percentages and categorised as ‘most needed’, ‘needed’ and ‘not needed’. The training needs of the Institution were examined on the criterion of the availability of required infrastructure, resource persons, and funds.

3.4.2 TRAINING PLAN DEVELOPMENT (TPD)

After the assessment of training needs, appropriate training plans were to be developed in the second phase. The good training plan must have clearly and comprehensively considered on the following elements. Hence the present training programme was framed scrupulously.

3.4.2.1 Training plan. For the present study short term training programmes were formulated

3.4.2.2 Training policy. Considering the needs of trainees and discussion with the experts training policy was finalised; for enhancing mushroom cultivation as an income generating activity there is great need to popularised oyster mushroom as health food among community.

3.4.2.3 Target of productivity. Study was targeted to train 300 respondents of the above said categories in OMC.

3.4.2.4 Training results. Respondents will come to know about the edible mushrooms and the skill in OMC, will be developed. The respondent will be knowledgeable about nutritive and medicinal value of the oyster mushrooms and
mushroom cookery of Indian taste. The overall effect will develop the positive attitude of the respondents towards mushrooms, which helps in the inclusion of mushrooms in their diet and ultimately improve the family health. The unemployed youth may select OMC as an avenue of self-employment.

3.4.2.5 Training target group. Training target group was comprise of homemakers and unemployed youths residing in Amravati and near by town. It was a heterogeneous group, but for the ease and convenience in training, it was categorised in homogeneous batches. Each batch includes twenty five to thirty trainees.

3.4.2.6 Training programme. To accomplish the target of 300 respondents, number of training programmes, period, mode, schedule, dates and weekdays were finalised. A calendar of training programme is illustrated in “Appendix 2.”

3.4.2.7 Training finance. Training programme cannot be organised and implemented without availability of adequate and timely funds. Therefore the estimated budget of the training programme was prepared well in advance. Details of budget of training programme are illustrated “Appendix 3.”

3.4.2.8 Training fee. Any institute or agency had not sponsored the training programme, hence a nominal registration fee was charged to meet the expenditure to be incurred and the researcher had shared the remaining expenses.

3.4.2.9 Trainer. Trainer plays very crucial role in facilitating effective learning of the trainees. Selection of the trainer was done meticulously after assessing the educational qualification, subject knowledge, teaching experience, and training skill. Keeping in view the scope of training objectives and coverage of the course, trainers were selected. Precaution was taken that each trainer should not get more than two sessions. The proforma of bio-data of trainer is illustrated “Appendix 4.”

3.4.2.10 Supporting training materials. Training in OMC requires substrate and spawn, which was made available well in advance. In order to illustrate the progressive stages of OMC the specific interval and respective dates of spawning the bags were fixed. The stages in OMC were prepared and illustrated in each training programme.

3.4.2.11 Training responsibility. A formulated training plan is essential for preparation and implementation of training programme, under which the
responsibilities of trainer, superintendent, demonstrator, laboratory attendant, and peon were specified clearly and conveyed to them, at the same time checklists were also prepared and provided for better understanding. The checklists are presented “Appendix 5.”

3.4.3 DESIGN OF TRAINING PROGRAMME (DTP)

The design of training programme was operationalised in this phase. Which provides the content of the programme. The DTP consist sub systems namely, training objectives, curriculum development, training methodology, training technology and supporting training material.

3.4.3.1 Training objectives. Training objectives enables the trainer to design the learning experiences on sound professional lines and provide appropriate criteria for evaluation. Training objectives were framed on the basis of training needs and overall level of understanding of the respondents and finalised after the discussion with experts. These objectives were categorized into three classes as; cognitive, conative and affective.

3.4.3.2 Curriculum development. As a need base approach of training was preferred, curriculum was developed in consultation with subject specialist, expert in education and extension workers of the locality.

The general and specific objectives based on training needs were formulated. Then the list of all relevant items was prepared. A five point rating scale was formulated to rank these items according to objectives and utility of subject matter to the target group. This rating scale was mailed to the forty subject experts working at the different centers in India with prepaid self-addressed envelopes, “Appendices 6 & 7.” Out of which 25 experts have responded and sent their reply of instructions. The score allotted to each item was quantified and weighted mean was calculated. The items got three and above weightage were included in the course content. According to the ‘Concentric Circle Approach to Curriculum’ the subject matter was divided into three categories viz., i) Must know ii) Should know iii) Could know.

3.4.3.3 Training methodology. Training methods are the means for attaining the objectives. The training methods were selected scrupulously considering in background of a trainees, training needs, need of training curriculum...
and time available for training. The methods used during training programme were; Lecture method, Method demonstration, Step demonstration and Action learning. (Diia-2)

3.4.3.4 Training technology. Training aids can increase and reinforce the training. To make training an enduring exercise, supporting material were developed simultaneously as training input. Selection of training media was done meticulously keeping in view the nature of audience and training objectives. The following materials were used as training aids, charts, Photographs, over head projector, transparencies and chalkboard.

3.4.3.5 Course material. Course material is required to be specially developed for a particular training course keeping in mind the requirements of the trainees, for the training in OMC following course material was prepared and illustrated in “Appendix 8.”

- **The folder** - The specially prepared folder includes the information about the design of training programme and some instruction about successful cultivation of oyster mushroom. It includes worksheet to keep the progress record and a table to note the weight of each flush. This folder avails the opportunity of recording the practical experience and feeling of the trainees.

- **Leaflets** - A set of leaflets containing information was prepared, as the course contents are exhaustive. These leaflets were well planned and evaluated for its coverage and utility to trainees by the mushroom cultivators in different part of Maharashtra State as well as by the respondents of pilot training programmes. (Appendices 9 & 10) A five point rating scale was prepared to rank the coverage and utility of the leaflets.
  - **Leaflet No. 1** - It provides the knowledge about procedure and process of OMC.
  - **Leaflet No. 2** - It includes the information regarding nutritive value and mushroom recipes.
  - **Leaflet No.3** - This leaflet gives the guidelines about mushroom diseases especially insect, pest, and the remedies for their control.

### 3.4.4 TRAINING PROGRAMME IMPLEMENTATION (TPI)

Training needs assessment, development of training plans, and design of training programmes is followed by the next phase of training cycle i.e. Training
Diagram-2: Extension training methodology cone.
programme implementation. The implementation phase consists of two sub-phases
1) Preparation, and 2) Implementation.

3.4.4.1 Preparation. Includes readiness of plan for required activities. It has
two components; i) Planning and ii) Contingency plan.

- **Planning** enables to prepare for conducting a training programme and
contingency plan to take care of training in the event of failure of planning.
  
  - *Pre training contact with participants*- an effective training design needs
pre-training contacts with participants. Effort was made to extend invitation
to perspective participants to participate in training programme. Therefore a
brochure of training in OMC was prepared. This brochure was
communicated to colleges and other institutions, such as anganwadi and
gramsevika training centers, “Appendix 11.” This information was also
disseminated through local newspapers. The visits of the nominating
authorities were organised to create motivation in OMC.
  
  - *Preparation of Time Table*- Time- table is the line of action in logical
sequence determined consciously in advance. On the basis of designed
training programme a schedule of activities was prepared. A programme
scheduled was prepared considering requirements of learners (training needs)
and linkages of learning process. The format of the time table and the details
of training schedule is illustrated in “Appendix 12.”
  
  - *Duty charts* - Supporting staff is essential for efficient management of the
training programme. It includes personnel like driver, clerks, laboratory
assistant, and peon. The duty chart, including date and time was announced
well in advance and presented under “Appendix 13.”
  
  - *Checklist* - A checklist was prepared to check the preparation of training
before its commencement. This includes lecture hall, light arrangement,
laboratories, and demonstration facilities etc.
  
  - *Meeting for finalising the arrangements*- First meeting was organized before
finalizing the plan of training programme. Many innovative ideas were come
up in this meeting. A final winding up meeting was held on the previous day
of the training to ensure the preparation of training institution and supporting
arrangement.
• **Contingency plan** - Contingency planning is required to be undertaken by training organisers as fail-safe measure. It enables prevention of training mishap by ensuring that a training programme is not interrupted in case the pre-planned arrangements do not materialised in practice as planned. Contingency plan prepared for training is described as below.

  • **Cover the resource person** - Under circumstances when the resource persons could not reach the venue of training at a scheduled time, in such situation the faculty members were prepared to keep the participants usefully engaged.

  • **Stand by arrangement** - A breakdown in power supply interrupts the proceeding of a training programme, in such situation a battery operated emergency lights, microphones, audio-visual aids and OHP were kept ready at the training centre.

3.4.4.2. Implementation. The training plan was well prepared and a contingency plan was carefully developed in the preparation sub-phase. However certain aspects of implementation sub-phase deserves notice for effective training are as follows,

• **Arrangement for reception of trainees** - Prior the commencement of training programme, the trainees were welcomed by the receptionist, collected the registration forms filled by the trainees and handed over training material to them. The receptionist was prepared to answer the questions and queries of trainees and was also asked to note the requirements of the trainees.

• **Feedback from trainees** - Feedback facilitate to improve the quality of training by identifying the shortcomings of the process. The feedback from the trainees was most valuable. Therefore some informal questions were asked to the trainees viz., what do you feel about training programme? Do you like it or not? How good was the demonstration in the last session? Answers of such questions from trainee were indicating the direction in which training is proceeding.

• **Training Environment** – Training environment was a part of the implementation of training programme to promote exchange of ideas and experience appropriate training environment was created. Past training experiences were guided in this regard.

Thus implementation component required constant vigilance and follow-up. It was based on promoting and sustaining an appropriate training environment.
3.4.5 TRAINING MONITORING AND EVALUATION (TME)

The last phase of training cycle is Training Monitoring and Evaluation. This phase was concerned with generation, management, and inferences from the results of the training endeavor with a view to assess whether the objectives of training had been attained or not? for effective improvement in the ongoing training strategies. TME consist of two sub-systems a) training monitoring, and b) training evaluation.

3.4.5.1 Training Monitoring. The basic objective of training monitoring was to keep all concerned with training, informing that the training activities were proceeding as planned. If there is any deviation from the planned course, the nature and extent of deviation that required for setting course in right direction is to be decided. There are three main domains of concern in training monitoring namely,

- The Domain of Top Management - The top management is concerned path analysis with training monitoring. Knowing whether the candidates slotted for a training programme have attended it or not? and the results of training.
- The Domain of Trainer- Trainer concerned with training monitoring as he knows whether all required arrangements were made or not? their working in practice and results of training.
- The Domain of Trainee - The trainee is concerned only with results of training.

Misra (1990) proposed design and use of training monitoring indicators were used for training.

- Training Monitoring Indicators - Indicators were defined as specific and objective measures of changes or results brought out by an activity.
- Training Performance Indicator- Training performance is a matter of continuing concern to top management. Training performance has three dimensions. Namely: participation, utility, and effectiveness.

  - Training Participation Index (TPI) - TPI was calculated to know the rate of participation in training programme by using the following formula.

\[
\text{Training participation Index} = \frac{Ta^*}{Ts^*} \times 100
\]

Where, \( Ta^* = \) Numbers of trainees attending the course
\( Ts^* = \) Number of trainees slotted for the course
Training Utility Index (TUI) - TUI was calculated to evaluate usefulness of training to trainees, decides the usefulness of training to them. The TUI is concerned to the trainer and training institution and which was calculated as,

\[
\text{Training utility Index} = \frac{Te^*}{(TUI)} \times \frac{100}{Ta^*}
\]

Where, \( Te^* \) = Numbers of trainee who found training course useful

Training Effectiveness Index (TEI) - TEI was calculated to examine the effectiveness of training programme. This incorporates the viewpoint of top management and trainees the following formula was used

\[
\text{Training Effectiveness Index} = \frac{Te^*}{(TEI)} \times 100 \quad \frac{Ts^*}{}
\]

3.4.5.2 Training Evaluation. Training evaluation means an attempt to obtain information on the effects of a training programme and to assess the value of training in the light of that information. No training programme could be said to have been organised completely without training evaluation. Training evaluation can helped in sharply for defining the training contents, make training methods to meet the requirement of trainees, relate them to their training needs and reducing the training cost. To derive maximum benefit from evaluation, it should be treated as a process and must be undertaken before, and after training. There are various methods and models of training evaluation. For the present study, objectives of training programme was categorized as cognitive, conative, and affective domain, and the effect of training was quantified by reaction evaluation, learning evaluation, performance evaluation, and attitudes were evaluated.

- Reaction Evaluation - Reaction evaluation was operationally defined as the reaction of trainees with different components of a training programme, such as topic covered, training aid, and physical facilities provided. This evaluates the
trainer and the training environment. A five point rating scale was structured to elicit the data.

- **Learning Evaluation** - Learning evaluation was operationally defined as a process of measuring the understanding and perception of new ideas, concepts, principles, and techniques or skills by a learner from training programme. A knowledge rating scale was developed to measure knowledge regarding oyster mushroom

- **Performance Evaluation** - Learning of knowledge and skill is pre condition for its application in day to day activities. The performance of trainees was evaluated by a performance rating scale as a result of training programme.

- **Attitude** - The attitude of learner plays crucial role in learning process. Three-point attitude scale was used to know the attitude of the trainees regarding OMC. Prepared printed folder had scope to express the feelings of trainees and the expressions of feelings were indicators of the attitude.

Thus the different phases of training described above were possible to develop a training cycle for training in OMC. The training cycle had its system, sub-systems and their linkages to operate efficiently.

### 3.5 Pilot Study

The pilot study was conducted for pre-testing, trouble shooting, and improving the training design as well as tools of data collection. The information gained during pre-testing gave further direction to revise design of training plan and tools of data collection. During pre-testing suspected problems and weakness were rectified. The pretest group was similar to targeted population. The efforts taken for pre-testing relates to ease in design of training plan and to the quality results.

#### 3.5.1 FIRST PILOT TRAINING PROGRAMME

An OMC is a new concept, which needs to popularize amongst the people. The nearest locality to the training institution was selected, for conducting pilot training programme. The knowledge of the respondent about oyster mushroom was tested by knowledge test during discussion and attitudes towards mushrooms were assessed. Then the introductory lecture on importance of OMC was organized.
motivates the people for participating in training. The forty respondents were registered and training was conducted as per schedule. On evaluation of training following results were observed.

☐ The participation of respondent was satisfactory.
☐ There was inconvenience in use of training material.
☐ The learning environment was not effective.
☐ Trainer felt that trainees were not attentive.
☐ The attendance of the trainees in the second phase was irregular and according to their convenience.

3.5.2 SECOND PILOT TRAINING PROGRAMME

The venue of first phase training programmes was changed as P.G.T.D., of Home-science, Amravati University, Amravati. The nominations were invited through local newspapers. 30 trainees were registered for this training. The training was executed and the trainee’s carried their own mushroom beds at their home. The trainees were categorized according to locality and asked to collect in a batch of 4-5 trainees. The convenient dates after fifteen days were decided before concluding the first phase programme. The second phase training programme was organised at trainee’s place, the purpose behind this was to create curiosity and motivate the other people for the training in OMC. But results were not much satisfactory, hence reconsidered on the training design.

3.5.3 THIRD PILOT TRAINING PROGRAMME

In the modified design, the venue of the training was P.G.T.D., of Home-science, Amravati University, Amravati. In first phase of training, lecture on introduction of mushroom and lecture cum demonstration of OMC were organized. The step demonstration of progressive stages of OMC were illustrated. Arrangement for the individual participation was made. The trainees carried their own mushroom beds at their own places and maintained climatic conditions as advised and kept observation up to the harvesting period. The checklist of the expected changes was provided them to keep records. The contact phone numbers of the trainers and organisers were communicated and asked them to dial, in case of any difficulty. The second phase training was organized after fifteen days. This
experience was enthusiastic and practicable as it develops the confidence and interest of the trainees, hence this design was finalised.

3.6 Sample and Sampling Techniques

Amravati City has attained name and fame in the field of education. There are many colleges and educational institutes established in the city. Naturally the number of educated youth is enormous. These youths are migrated from the rural areas, therefore they are familiar with the agriculture and other agro-based business. Most of the youths are unemployed; hence they are always in search of employment avenues and willing to earn while they are learning. The industrial area of the city is not developed; hence it can not provide ample job opportunities for them. Therefore OMC will be a good avenue for self-employment to them. The maximum female folk of the city is homemaker and a very few is engaged in government and private services. Maximum homemakers have ample leisure time and most of them are migrated from rural areas, they are familiar with agriculture. Hence OMC may be an interesting hobby for these homemakers and they can cultivate and cook oyster mushroom for their family diet and enhance the health status of their family members.

Oyster mushroom cultivation is a leisure time activity and side business. Hence it was planned for an individual, especially for farmers, homemakers, unemployed youths, and other interested persons.

The advertisement was disseminated through local newspapers for the training programme. The interested persons enrolled themselves for the training. Total enrolled respondents were termed as population of the training. In the year 1996-98 in all 250 respondents had attended the OMC training. The trainee, those attended both the phases of training, and were able to respond the evaluation proformas, were selected. The list of 150 selected trainees was prepared by equal interval method of random sampling.
3.7 Development, Pre-testing and Administration of Tools of Data Collection

Data are vital component of any research study and therefore a prime requisite. Various tools were used for collecting the data on various aspects. These tools were pre-tested for 70 respondents during pilot training programmes. These respondents were not included in the sample. Necessary additions, deletions, and modifications were made after pre-testing. (Appendix 14)

The secondary data were obtained from the office of Amravati Municipal Corporation. The primary data was collected by questionnaire filled by the trainees. A questionnaire was developed on different aspects of the training. The structured questionnaire consisting of various indices, tests, and scales to measure the variables was prepared for this purpose. Beside this, the items to study the opinion and suggestions regarding some important aspects of the training were included in questionnaire.

3.8 Variables and Their Measurement

A variable is any property trait, attribute or characteristics of some event, object or person that may have different values at different times depending on the conditions. Learning and its subsequent transfer to perform the activity were linked not only to the training, but also to the capacity of trainees to learn. The capacity to learn is sometime relates to the personal, social, economic, and situational variables of the trainees.

The review of literature and the experiences of the pilot training programmes i.e. theoretical, logical, cause effective relationship was considered as basis for selection of variables for the present study. The operational definitions at relevant places have been given consciously. The measurement and categorization is as follows. (dia. 3)

3.8.1 INDEPENDENT VARIABLES

The independent variables were indicative of personal, social-economic, psychological, and situational characteristics of the trainees. They are as follows.
1) Age
2) Education
3) Occupation
4) Annual income
5) Size of family
6) Family background
7) Social participation
8) Infrastructure availability

3.8.1.1 Age. Age is an extent to individual is old. The chronological age of the trainee at the time of training was measured in terms of number of years. The completed year of age was treated as the score of an individual trainee. The categorization according to age of trainees was done as follows.

   Age category (Years)
   17-25
   26-35
   36-45
   46-55

3.8.1.2 Education. Education is a mark of around development of an individual. Education of trainees operationally defined as formal schooling. The numerical ‘one’ was allotted for each year of formal schooling of the trainee. Jetley (1977), Desai (1981), and Shinde (1997) followed the same procedure. The trainees were categorized according to education as follows.

   Category
   Middle School
   High School
   Graduate
   Post Graduate
   Above Post-Graduate

3.8.1.3 Occupation. Occupation was operationalised as a main source of earnings of trainees. The numerical scores for occupation allotted precisely and categorized as follows.
Category | Score
---------|------
Homemaker | 1
Unemployed | 2
Agriculturist | 3
Servicemen | 4
Businessmen | 5

3.8.1.4 Annual income. The annual income was operationally defined as the income per annum derived from main as well as subsidiary occupation of the family of trainees. The annual income in terms of thousand rupees was measured and the numerical of the income was the score for the income. The categorization of trainees according to annual income was as follows.

<table>
<thead>
<tr>
<th>Category</th>
<th>Income (Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Up to 12,000</td>
</tr>
<tr>
<td>Low medium</td>
<td>12,001 to 60,000</td>
</tr>
<tr>
<td>High medium</td>
<td>60,001 to 109,000</td>
</tr>
<tr>
<td>High</td>
<td>109,001 to 158,000</td>
</tr>
</tbody>
</table>

3.8.1.5 Size of family. The size of family determines the capacity for investment of human resource available at trainees. The family size was operationally termed as number of adult in the family. The numerical of family member was the score for the size of family of the trainees. The categorization of trainees according to size of family was as follows.

<table>
<thead>
<tr>
<th>Category</th>
<th>No. of Family members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>1 - 3</td>
</tr>
<tr>
<td>Medium</td>
<td>4 - 6</td>
</tr>
<tr>
<td>Large</td>
<td>7 - 9</td>
</tr>
</tbody>
</table>

3.8.1.6 Family background. Family background was operationalised as the residence and contact of the family of trainee with rural or urban area. The family having rural contacts may familiar with the substrate and they can avails the required substrate for OMC. Hence the numerical score ‘2’ was allotted for rural background and ‘1’ was the score for urban background. The categorisation of trainees according to family background was as follows.
### 3.8.1.7 Social participation

Social participation of trainees was operationalised as membership and office bearer of any formal, informal organisation. The social participation was measured as ‘1’ numerical score for participation, ‘2’ was the score for membership of each organisation and score ‘3’ was allotted for the office bearer of each organisation. The categorisation of trainees according to social participation was as follows,

<table>
<thead>
<tr>
<th>Category</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>2</td>
</tr>
<tr>
<td>Urban</td>
<td>1</td>
</tr>
</tbody>
</table>

### 3.8.1.8 Infrastructure facilities

The required infrastructure for OMC is, mushroom house or place for cultivation, substrate, spawn, and water. According to the availability of the infrastructure facilities of the trainees score was allotted. For availability of each facility ‘1’ numerical score was allotted and total score was summed up. The categorisation of trainees according to availability of infrastructure was as follows,

<table>
<thead>
<tr>
<th>Category</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>0 - 1</td>
</tr>
<tr>
<td>Medium</td>
<td>2 - 3</td>
</tr>
<tr>
<td>High</td>
<td>4 - 5</td>
</tr>
</tbody>
</table>

### 3.8.2 DEPENDENT VARIABLES

The dependent variables selected for the study were as follows,

1) Knowledge
2) Skill
3) Attitude
4) Satisfaction
5) Total training effect.
3.8.2.1 Knowledge. Knowledge is one of the important component of covert to overt behaviour of an individual (Reddy, 1966). For the present study, knowledge was operationalised as the information of trainees concerning facts and concept, mushroom cookery and nutritive and medicinal value pertaining to oyster mushrooms. Before and after training knowledge of trainees was assessed by knowledge test for knowing effect of training. The before and after knowledge indexes were calculated by using the formula,

\[
K.I. = \frac{\text{Total knowledge score obtained}}{\text{Total obtainable knowledge score}} \times 100
\]

A battery of 40 knowledge items was prepared and advocated to the trainees on binary rating. The test was divided into two parts A and B. The part A was related to cultivation process, administered in the first phase of training and part B was regarding nutritive and medicinal values of oyster mushrooms was used during the second phase of training programme. For each practice item known score '1' was given. Thus the total score formed the knowledge of the trainees. The total score so obtained was converted into Knowledge Index as stated above and termed previous knowledge. The trainees were categorised on the basis of previous knowledge, K.I. by using equal interval method as follows,

<table>
<thead>
<tr>
<th>Category</th>
<th>Score (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inadequate</td>
<td>0 - 33</td>
</tr>
<tr>
<td>Adequate</td>
<td>34 - 66</td>
</tr>
<tr>
<td>High</td>
<td>67 - 100</td>
</tr>
</tbody>
</table>

The respondent was categorised on the basis of after training K.I. by equal interval method, as follows and considered as present knowledge of trainees.

<table>
<thead>
<tr>
<th>Knowledge level</th>
<th>Score (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>0 - 33</td>
</tr>
<tr>
<td>Medium</td>
<td>34 - 66</td>
</tr>
<tr>
<td>High</td>
<td>67 - 100</td>
</tr>
</tbody>
</table>

To know the change in knowledge due to training the Standard Learning Index was calculated by using the formula,
Post training K.I. - Pre training K.I.

\[ SLI = \frac{\text{Post training K.I.}}{100 - \text{Pre training K.I.}} \]

The respondents were categorised according to SLI and described as change in knowledge.

<table>
<thead>
<tr>
<th>SLI (%)</th>
<th>0 - 33</th>
<th>34 - 66</th>
<th>67 - 100</th>
</tr>
</thead>
</table>

3.8.2.2 Skills. Skill is an ability to do things effectively, apply knowledge and person's aptitudes and attitudes in work situations (Kurb and Prokopenko, 1989). Since the prime purpose of training is to create ability in training to put knowledge into practice, the degree of skill acquired, needs to measure. For the present study skill were operationalised as the sequence of action and application of knowledge in the process of OMC. The observers were trained for judging and rating the activities in OMC. The skill score of each trainee was quantified by using formula and termed as extent of skill.

\[ \text{Skill score} = \frac{\text{Total obtained score}}{\text{Total obtainable score}} \times 100 \]

A five-point test of 30 items was prepared on the basis of desired behaviour while preparing oyster mushroom bed. The performance of the trainees was assessed during the active participation session of the training. Score '5' allotted for the exactly expected behaviour, '4' for the very good, '3' for good, '2' for satisfactory, and '1' was for the poor performance of the trainees. (Appendix 15)

The total obtained score was summed up and converted into skill score. The trainees were categorised according to skill score by using equal interval method.

<table>
<thead>
<tr>
<th>Category</th>
<th>Scores (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>0 - 33</td>
</tr>
<tr>
<td>Medium</td>
<td>34 - 66</td>
</tr>
<tr>
<td>High</td>
<td>67 - 99</td>
</tr>
</tbody>
</table>
3.8.2.3 Attitudes. Positive attitude is a pre-requisite for acquiring knowledge and skills. Thurstone (1946), defined attitude as the degree of positive or negative effect associated with some psychological object. In the present study attitude has been operationally defined as the tendency of the trainees to respond positively or negatively regarding oyster mushrooms. To know the state of mind of respondent regarding oyster mushroom, the three point attitude scales was administered. Before and after training, attitudes score was calculated. The trainees were categorised according to before training attitudes by equal interval method, described as previous attitudes.

<table>
<thead>
<tr>
<th>Category</th>
<th>Score (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not favourable</td>
<td>0 - 33</td>
</tr>
<tr>
<td>Favourable</td>
<td>34 - 66</td>
</tr>
<tr>
<td>Highly favourable</td>
<td>67 - 99</td>
</tr>
</tbody>
</table>

The attitudes of trainees after training were quantified. The score was converted into percentage and labeled as present attitude and categorised as follows,

<table>
<thead>
<tr>
<th>Category</th>
<th>Score (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>0 - 33</td>
</tr>
<tr>
<td>Medium</td>
<td>34 - 66</td>
</tr>
<tr>
<td>High</td>
<td>67 - 100</td>
</tr>
</tbody>
</table>

To acquaint with the change in attitudes due to training, the percentage change in attitudes was calculated by using the formula,

\[
\text{Percent change in attitudes} = \frac{b - a}{b} \times 100
\]

Where,  
\(a\) = Total obtained score  
\(b\) = Total obtainable score

The trainees were categorised according to percent change in attitude.
3.8.2.4 Satisfaction. The end product of the teaching effort is the satisfaction that comes to learner as a result of solving a problem, meeting a need, acquiring a new skill or some other changes in behaviour (Supe, 1990). For the present study, satisfaction was operationalised as the reaction of the trainees on different components of training programme. A five point rating scale on various aspects of training as: selection and presentation of training methods, training aids, provided physical facilities and opinion about trainers. The score was allotted as, 5 for excellent, 4 for very good, 3 for good, 2 for satisfactory, and 1 for poor.

The total score for satisfaction was quantified and the satisfaction index was calculated by using formula as follows,

\[ S.I. = \frac{\text{Total score obtained}}{\text{Total obtainable score}} \times 100 \]

The trainees were categorised according to satisfaction by using equal interval method as follows,

**Category** | **Score (%)**
---|---
Not satisfied | 0 - 33
Marginally satisfied | 34 - 66
Fully satisfied | 67 - 100

3.8.2.5 Total training effect. The total training effect was operationalised as the total change in knowledge, skill, attitude and satisfaction of trainees. It was computed by using the formula;

\[ \text{Total training effect} = \text{SLI} + \text{skill score} \times \% \text{change in attitude} + \text{satisfaction index} \times \%

The trainees were categorised according to total training effect by equal interval method.

**Category** | **Score**
---|---
Low | 94-125
Moderate | 126-156
Adequate | 157-186
High | 187-216
Diagram-3: Conceptual model of the effect of training programmes in OMC.
3.9 Statistical Analysis

Various statistical methods have been used for analysing and interpreting the data. The details about the statistical techniques and test used are summarized below.

- Percentage
- Means
- Standard deviations
- 't' Test
- Analysis of variance
- Coefficient of correlation
- Regression analysis

Different statistical methods were used to analyse the interpretation of data. The relationships between various independent variable and dependent variables were found out. For all-purpose mentioned above percentage, means, standard deviation, analysis of variance, coefficient of correlation, regression analysis and test of significance of variance were used. The formulae used for different tests were as follows:

- **Standard deviation** (S.D.) is the most stable index of variability and is employed in research studies. (Garrett and Woodworth, 1967)

  \[
  \text{S.D.} = \sqrt{\frac{fx^2}{N}}
  \]

  \[
  \text{S. D.} = \sqrt{\frac{d^2x}{N} - \frac{(\Sigma dx)^2}{N}}
  \]

  Where \( fx^2 \) = Standard deviation by frequency
  \( N \) = Mean of the squared deviations.

- Coefficient of variations
To find out the percentage variation between the observations, analysis of variance was made. It was calculated in terms of coefficient of variation and the following formula was used.

$$C.V. = \frac{S.D.}{\text{Mean}} \times 100$$

- **Coefficient of correlation**

  The coefficient of correlation is that ratio which express the extent to which changes in one variable accompanied by changes (or depend upon) in a second variable (Garret and Woodworth 1967).

  The coefficient for correlation was used for finding out relationship between different and independent variables. The Karl person's coefficient of correlation was computed by following formula.

  $$r = \frac{\Sigma xy}{\sqrt{\Sigma x^2 \times \Sigma y^2}}$$

  Where, $r = \text{Coefficient of correlation}$
  
  $x = \text{Score of independent variables}$
  
  $y = \text{Score of dependent variables}$
  
  $xy = \text{Sum of product of x and y series}$

  In order to study the relative contribution of independent variables to the variation in dependent variables, both individually as well as in combination, Multiple Regression Analysis was employed.

  For testing the difference in score of each statement, the total score obtained by each subject was calculated. The value of ‘t’ is the measures of the extent to which given statement differentiate between high and low groups.

  The data was punched in word star programme. The programme developed in computer calculated the coefficient of correlation, multi-linear regression.