CHAPTER – 6

Research Methodology
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RESEARCH METHODOLOGY

The study aims at exploring the potentials and finding the means and ways of promoting the traditional knowledge by developing effective policy recommendations for the achievement of benefit sharing of the traditional knowledge holders of India in particular and the world population in general. The broad aspects of research methodology are briefly given below:

Nature of the Study

The nature of this study is characterized by the following features-

1. Descriptive Research.
2. Applied Research
3. Empirical research
4. Exploratory research

A. Descriptive Research

As the major purpose of this research is the description of the state of affairs as it exists. This research has been put into the descriptive research category. It aims at obtaining the information on people's attitudes towards the acknowledgement of the contribution of traditional knowledge. The management of traditional knowledge is socially oriented and leads to the improvement of quality of life and supplies better amenities to mankind in keeping with the growing and varied requirements of the society.

Being a descriptive research, it tries to identify the complex human behavior and the set patterns in it over which there is no control of the researcher. A descriptive research may not make a critical evaluation as an Analytical research can do. However, the human intelligence has led to the development of logical and systematized techniques being reasonably accurate in studying social phenomena. Individually human beings may be unpredictable, but collectively they tend to be reasonably accurately
predictable. Advancements in descriptive research methods have increased the accuracy of predictions considerably.

**An Applied Research**

As the research aims at finding a solution for an immediate problem facing a society it has been categorised under the heading of Applied research. A research in marketing is required to have a bias for application as D. S. Tull and D. I. Hawkins, state in the very first line of their book ‘Marketing Research’- “Marketing Research serves a single purpose that of providing information to assist marketing managers and the executives to whom they report to make better decisions”¹. Therefore, in spite of keeping the study wide enough and exploratory in nature, an attempt has been made to relate each aspect of the study with a managerial decision based on it. Each of the hypotheses is related with a management action. This enhances the value of the research beyond the fundamental research.

**It Relies on Empirical Evidence**

Most of the times relying on experience and observations has been preffered over relying solely on theory, or research has been done without giving due regards for the system and theory. It is data based research, coming up with conclusions which is capable of being verified by observations and especially when the available information is insufficient, the empirical study is the only way to get it.

In this particular case also, lack of sufficient written information on various use of traditional techniques has been the main reason for preferring an empirical study. An extensive survey in the four East and North Indian districts/ cities has been conducted and it is expected that the results may necessitate the changes in the presently held opinions and help in building a new theory altogether.

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An Exploratory Research

The approach of the study is exploratory in the sense that it is mostly directed towards the development of hypothesis rather than their testing. This approach is generally followed for new areas of investigations where the problem itself may not be very clear and is needed to be diagnosed. The domain of the research is also required to be reasonably wide but properly specified.

This approach was thought necessary for this study in view of the emerging needs of the present condition of traditional knowledge holders in general and in few specified fields such as herbal medicine, agriculture sector in particular. Neither is the herbal medicines industry well defined in India, nor do we get enough examples of studies in this area.

The exploratory nature has necessitated keeping the coverage of the study wide enough to cover all dimensions of the contribution of traditional knowledge.

Research Approach

As the research is concerned with qualitative phenomenon, i.e., phenomenon relating to or involving quality or kind is has been categorized as a qualitative research. This research aims at discovering the mindset of general public regarding traditional knowledge, using in depth interviews for the purpose. Applying qualitative research is relatively a difficult job and needs some more experience and observations.

This approach can further be specified as inferential approach, as this research forms a data base from which characteristics or relationships of population has been inferred. This means survey research where a sample of population is questioned to determine its characteristics, and is then inferred that the population has the same characteristics.

An advantage of this approach is that it brings the researcher and the respondent face to face and their cooperative efforts help to build up a better research database. Personal contact enables the researcher to use his
intelligence to elicit precise information from them and analyze the data in the light of his experience. In fact it establishes a liaison between the research laboratories and field situations and stimulates research both ways.

This approach involves considerable time and effort in field investigations and requires sampling, questionnaire design, questionnaire administration and data analysis. The approach that has been decided to be used in this survey is structured and direct using personal interview method.

The research is also concerned with subjective assessment of attitudes, opinions and behavior. Research here is also a function of researcher’s insights and impressions. This research approach has generated results in non quantitative form or in the form which are not subjected to rigorous quantitative analysis.

**Area selection and scope determination**

Covering the whole area being enriched with the contribution of traditional knowledge was not possible in the study due to time and cost constraints. The study has been divided in two parts.

Firstly a step has been taken towards achieving the goal of finding out the important areas where the contribution of Traditional Knowledge is very high or the areas highly enriched with traditional knowledge by conducting a survey at Aligarh district of UP. This study aimed to use primary cross-sectional data to identify the areas in which the use of traditional knowledge is very high. And also the areas in which the contribution of ITK is high in enriching the fields. Using stratified random sampling, 180 participants were selected to take part in this study, and data were collected through a structured questionnaire by interviewing the selected participants.

The areas that have been highly voted in favour of high use of traditional knowledge are listed below.

1. Agriculture
2. Herbal Medicine
3. Handicraft
Secondly an attempt is made in the current study to identify various traditional tools used for agricultural operations, traditional pest management practices, seed selection practices etc by the farmers in coastal districts of Orissa namely Jajpur and cuttack districts. For this purpose Using stratified random sampling, 180 participants were selected to take part in this study, and data were collected through an open ended structured questionnaire and it has been filled by the researcher herself through Participatory Rural Appraisal (PRA) tools like observation, Individual (One to one) discussion, Focus Group Discussion (FGD).

For the purpose of drawing conclusions and testing of hypothesis, the following methods were used in the process of data analysis:

1. percentage calculation for different parameters
2. Rank coefficient using the ranks and multiplying them with the appropriate weightage-coefficients rank wise
3. Rating scores for Likert scale analysis by multiplying the frequencies with the appropriate weightage-coefficients

T test for significance test

Hypotheses formulation

After understanding and rephrasing the research problem into meaningful terms from an analytical point of view i.e., the formulation of a general topic into a specific research problem, the researcher undertook literature survey connected with the problem. On the basis of knowledge gathered from the literature survey the researcher formulated working hypotheses i.e., tentative assumptions made in order to draw out and test its logical or empirical consequences.

Hypothesis for Chapter-6

The views between the respondents regarding the level of use of traditional knowledge in agricultural and herbal medicinal sector vary significantly.
(Ho1): There is a distinct level of use of TK in agriculture as perceived by the respondents of age group 1 of various professions.

(Ho2): There is a distinct level of use of TK in herbal medicine as perceived by the respondents of age group 1 of various professions.

(Ho3): There is a distinct level of use of TK in handicraft as perceived by the respondent of age group 1.

Hypothesis 4 (Ho4): There is a distinct level of use of TK in agricultural sector as per the respondents of various professions perceptions of age group 2 (25-35).

Ho5: There is a distinct level of use of TK in herbal medicinal sector as perceived by various respondents of various professions of age group 2.

Hypothesis 6 (Ho6): There is a distinct level of use of TK in handicraft sector as perceived by various respondents of age group 2.

Hypothesis 7 (Ho7): There is a distinct level of use of TK in agriculture as perceived by the respondents of age group 3 (25-35) of various professions.

Hypothesis 8 (Ho8): There is a distinct level of use of TK in herbal medicine as perceived by the respondents of age group 3 (25-35) of various professions.

Hypothesis 9 (Ho9): There is a distinct level of use of TK in handicraft sector as perceived by the respondents of age group 3 of various professions.

Hypothesis 10 (Ho10): There is a distinct level of use of TK in agriculture as perceived by the respondents of age group 4 (45 & above of various profession.

Hypothesis 11 (Ho11): There is a distinct level of use of TK in herbal medicine as perceived by the respondents of various professions of age group 4 (45 & above).

Hypothesis 12 (Ho12): There is a distinct level of use of TK in handicraft as perceived by the respondents of age group 4 of various professions.
Hypothesis 13 (Ho13): There is a distinct level of use of TK in agriculture as expressed by respondents of various professions belonging to rural area.

Hypothesis 14 (Ho14): There is a distinct level of use of TK in herbal medicine as expressed by respondents of various professions from rural area.

Hypothesis 15 (Ho15): There is a distinct level of use of TK in handicraft sector as perceived by various respondents of different professions of rural area.

Hypothesis 16 (Ho16): There is a distinct level of use of TK in agricultural sector as perceived by various respondents of different professions of urban area.

Hypothesis 17 (Ho17): There is a distinct level of use of TK in herbal medicinal sector as perceived by various respondents of different professions of urban area.

Hypothesis 18 (Ho18): There is a distinct level of use of TK in handicraft sector as expressed by respondents of various professions of urban area.

Hypothesis 19 (Ho19): There is a distinct level of use of TK in handicraft sector as expressed by respondents of various professions of urban area.

Hypothesis 20 (Ho20): There is a distinct level of use of TK in herbal medicine as perceived by the respondents of different professions of semi urban area.

Hypothesis 21 (Ho21): There is a distinct level of use of TK in handicraft as perceived by the respondents of different professions of semi urban area.

Hypothesis 22 (Ho22): There is a distinct level of enrichment in three sectors by traditional knowledge as perceived by respondents of different age groups.

Hypothesis 23 (Ho23): There is a distinct level of enrichment in three sectors by traditional knowledge as perceived by respondents of different professions.

Hypothesis 24 (Ho24): There is a distinct level of enrichment in three sectors by traditional knowledge as perceived by respondents of different areas.

Hypothesis 25 (Ho25): There is a distinct level of enrichment in agricultural sector as perceived by the respondents of different professions.
Hypothesis for Chapter -8

Ho26: Traditional Agricultural Tools are Easy to handle and cost effective.

Ho27: Traditional seeds and use of pesticides are inversely related.

Ho28: Traditional Agricultural Practices are more sustainable than modern agricultural practices.

Research Design

“A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure”\(^2\) The conceptual structure within which the research has been conducted has been stated below. The pre-requisite for the purpose involves to specify the means of obtaining the information, availability and the skills of the researcher, explanation of the reasoning leading to the selection of obtaining data and evaluate it in terms of time and resource constraints. As such the design includes an outline of what the researcher has done from writing the hypothesis and its operational implications to the final analysis of data.

The design of the structure of the study happens to be in respect of what, where, when, how much, by what means etc. Keeping in view the above, the overall research design has been split into following six stages:

1. Pilot Survey
2. Sample Size Determination
3. Sample Selection
4. Questionnaire Design
5. Field Work
6. Analysis and Testing

Now before we determine the above mentioned variables, it is preferable to prepare a list of the needed information.

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\(^2\) Claire Selltiz and others, Research Methods in Social Sciences, 1962, p. 50.
Information Requirement

After being satisfied with the statement of the research objective the researcher prepares a list of the information which is needed, to achieve the objectives.

1. What is the level of use of Traditional knowledge in various fields?
2. Whether Traditional knowledge helps in enriching the areas?
3. What are the tools being used in agricultural practices?
4. What are the methods of Production traditionally?
5. How do the traditional people control pests and diseases? Etc.

Sources of Data

Other than the secondary sources (published or unpublished) available to provide the relevant information from different websites, government agencies and the libraries the focus in this research is on the primary sources of information which is collected through survey of the following groups of respondents.

1. Students
2. Businessman
3. Service holder
4. Professionals
5. marginal farmers
6. small farmers
7. big farmers
8. old aged people and women engaged in farm activities.

An effort has been made to cover the cross-sections of the above groups. Separate questionnaires have been designed for separate groups of respondents.
Resource-Quantity Compromise

In an ideal world, a field research will involve the personal interviewing of all the individuals who can give relevant information or whose opinion is important. However, a trade-off between ideals and economic reality are inevitable. A number of reasons have been given by Livingstone:

1. Too many people are to be interviewed either in absolute terms or within any reasonable financial budget.

2. It may be impossible to get round all the people who are distantly located.

3. Some people may be unwilling to be interviewed but still might be ready to supply limited information sought in another way than by interview.

4. For indigenous Traditional Knowledge Language also become a constraint

There are of course other reasons but these, as well as three of the four listed above, almost inevitably come down to costs. With an unlimited budget most obstacles can be overcome, but no researcher is ever remotely likely to have an unlimited budget.

The compromise has mainly been done by way of limiting the scope of the study to only Eastern & Northern Zones of the country and a sample has been drawn of a limited number of cities from this. The questionnaire has also been designed to cover only the more relevant questions needed for the study to keep it within the manageable limits. The details of the design variables in the following pages will clearly show the nature of this compromise.

Pilot survey

While trying to prepare a design of the survey, it was thought necessary to conduct a test or pilot survey to ensure the work ability of the design before giving it a final shape. The pilot survey was mainly conducted for three purposes.

1. To determine the sample size.

2. To test the questionnaire.

3. To improve the fieldwork organization.
The most common method of sample size determination requires three kinds of specifications, namely allowable error, confidence coefficient and the estimate of the standard deviation of the population. The first two of these specifications are matters of judgment involving the use of data but the third specification, the estimate of the standard deviation of the population, is the responsibility of the researcher. Sometimes these estimates are available from the previous studies. But no previous study on these marketing aspects could be known that had been conducted for the study under consideration.

In the absence of such sources, one has to go for a pilot survey to estimate the population standard deviation and use it for sample size determination.

Another reason for conducting the pilot survey is to ensure that the questionnaire that has been designed and looks simple and unambiguous to the designer will appear equally so to the respondent. There is, therefore, a strong case for trying out the questionnaire in a pilot survey before the main launch. It can be a humbling experience for the designer to find what can go wrong.

If the researcher is not going to do the entire interview himself, it is useful for him to involve others in the pilot survey, while keeping himself also fully associated with it. This gives a good idea to the researcher of the possible difficulties in the fieldwork of the main survey. This helps the researcher in better fieldwork organization and control.

A small sample of 180 respondents was drawn from the city of Aligarh on convenience basis. It comprised of all the ‘types’ of the consumers i.e. urban, semi-urban and rural. The researcher visited a number of places to administer the first draft of the questionnaire. The problems arising in the field situations were carefully noted. The reactions of respondents to different questions were also carefully noted. The experience led to the modifications in the initial design in the following dimensions.

1. Changing the nature and wordings of some of the questions.
2. Changing the sequence of the questions looking to the level of difficulty.
3. Cutting short the size of the questionnaire by omitting some of the less important questions.

4. Preparing a different instruction set for the investigators.

5. Modifying the fieldwork plan in respect of time and effort requirement.

The analysis of the pilot survey was also done, so as to be used in the sample size determination. This facilitated deciding on the most immediate design variable i.e. sample size determination.

Sample Size determination

The logic of Sampling Distribution gives a relationship as follows-

Number of Standard Errors = Allowable Error
Implied by Confidence Coefficient Standard Error

Where Standard Error (defined as Standard Deviation of the Sampling Distribution) of the ‘proportion’ is given by-

\[ \sigma_p = \sqrt{\frac{\pi(1-\pi)}{n}} \]

The area under the sampling distribution between any two points can be calculated in terms of z-values. The z-value for a point is the number of standard errors a point is away from the mean. The z-values may be computed as follows-

\[
Z = \frac{\bar{X} - \mu}{\sigma_p} = \frac{D}{\sqrt{p(1-p)/n}}
\]

\[ D = \pi - \bar{p} \quad \text{where Population Proportion} = \pi \]

\[ \text{Sample Proportion} = \bar{p} \]

\[ \sigma_p = \frac{\bar{p} - \pi}{Z} \]
\[ n = \frac{\pi(1-\pi)z^2}{D^2} \]

Using the above formula, we take confidence coefficient level (CL) of 95%. The corresponding z-value associated with CL is 1.96 and take allowable error to be only 5%.

Thus the sample size calculation is summarized as-

Steps:

1. Level of precision \( D = p - \pi = \pm 0.05 \)
2. Confidence Level (CL) \( CL = 95\% \)
3. z-value associated with the CL \( z = 1.96 \)
4. Standard Deviation of the Population Estimate \( \pi \): \( \pi \) can take various values
5. Sample size \( n = \frac{\pi(1-\pi)z^2}{D^2} \)

Now, whatever the proportions (value of \( p \)), the sample size comes out to be less than 385. It will be more than sufficient to estimate the population proportions with 95 percent confidence, allowing only 5 percent error. Therefore a sample size of 400 has been decided for the study.

**Sample Selection**

A stratified cross sectional sampling design has been used. Stratification has been done on the basis of the type of city. The following two regions and the types of cities have been included in the study:

Region: 1. Eastern Zone & 2. Northern Zone

Types of cities: 1. Large size cities & 2. Small cities.
In the first stage two cities were selected from each zone i.e. Eastern Zone and Northern Zone. In the second stage respondents have been taken in equal number from each of the cities to ensure sufficient representation of each zone and the selected city. The whole population (Eastern and Northern India) has been divided into two strata (Divisions) of East and North zone. Out of these zones four cities were chosen on convenience basis. Consequently the following selections were made.

<table>
<thead>
<tr>
<th>Zones</th>
<th>Populations*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Zones</td>
<td></td>
</tr>
<tr>
<td>Cuttack</td>
<td>(Large city) 2,341,094</td>
</tr>
<tr>
<td>Jajpur</td>
<td>(Small city) 1,624,341</td>
</tr>
<tr>
<td>Northern Zone</td>
<td></td>
</tr>
<tr>
<td>Delhi</td>
<td>(Large city) 13,850,507</td>
</tr>
<tr>
<td>Aligarh</td>
<td>(Small city) 2,9992,286</td>
</tr>
</tbody>
</table>

* On the basis of census India 2001

This type of stratified sampling is on the one hand, expected to allow representation of all segments of the population in sufficient number and on the other hand facilitate using statistical tests to study the behavioral patterns of the different strata.

**Questionnaire Design**

Collecting information from the sample members, through questionnaire is quite popular in case of big samples as the research scholar has done here. The kind of questionnaire needed is a simple and straightforward one, in a get-up that may retain their interest till the end, a style that may not irritate them and its contents that may not lead to a non-response from them.

Before structuring the questionnaire the researcher has well kept in mind that a good questionnaire is easy to understand, simple to answer, interesting to complete and enjoyable to return. If one wants to design it he needs to know the respondents, their tastes and preferences and their culture.
The final drafts of the questionnaires, as used in the main survey have been included in the annexure.

Questions that put too great a strain on the memory or intellect of the respondent, questions of a personal character, questions related to personal wealth etc., have generally been avoided.

This whole analysis only ensures that the questionnaires are such that respondents can answer the questions correctly, but another equally important aspect is whether they will answer the questions correctly. This aspect calls for an attention to the field work exercise in the process of data collection.

Field Work

Conducting a survey in four cities of two zones requires making a team for the fieldwork. Investigators were required who may be familiar with these cities and who may personally visit these to interview the respondents and get the questionnaire filled up.

There was no difficulty in getting the first survey done at Aligarh and Delhi. This was a favourable factor in the conduct of the survey. For the second questionnaire also the researcher went to her home town and collected data.

The field work was finally completed but only after taking up the third phase of work. The whole exercise proved that the realities are different from theories.

Analysis and Testing of Results

The data after collection has been processed and analysed. The analysis involves converting a series of recorded responses in the questionnaires into descriptive statements and inferences about relationships. The important steps followed in the analysis of this survey are:

1. Editing
2. Coding
3. Classification

4. Tabulation

5. Use of Statistical Tests

Editing has been done to assure that the data are accurate, consistent with other facts gathered, uniformly entered, as completed as possible and have been well arranged to facilitate coding and tabulation. Since the questionnaires were fully structured ones, with a very few open-ended questions, the editing was not a very difficult task. The questionnaires found incomplete or illegible were rejected and were replaced by others, arranged in the next phase of the survey.

In the process of coding numerical have been assigned to the answers so that responses can be put into a limited number of categories or classes. Such classes are appropriate to the research problem under consideration. They possess the characteristics of exhaustiveness i.e., there is a specific class for every item and also mutually exclusive which means that a specific answer has been placed in one and only one cell in a given category set. Another rule has been observed that is unidimensionality by which is meant that every class is defined in terms of only one concept.

The research studies resulted in a large volume of raw data which has been reduced into homogenous groups in order to get meaningful relationships. This was a process of arranging data in groups or classes on the basis of common characteristics.

In the tabulation stage, the responses were recorded from the questionnaires to the “Master Chart”. Each row of it showed responses to one questionnaire and the different columns were meant for different questions. This information was further condensed on two charts called summarized tabulation sheets. This is a frequency chart showing the frequency of different answers by different segments of the respondents. Different columns represent the question number and the rows represent the codes of alternative answers, segment-wise.
This is followed by making individual tables for each aspect of the study and a few for cross analysis relating those aspects with background factors like profession, age, home town etc.

For the purpose of drawing conclusions and testing of hypothesis, the following methods were used in the process of data analysis:

1. Percentage calculation for different parameters
2. Rank coefficient using the ranks and multiplying them with the appropriate weightage-coefficients rank wise
3. 't' test for significance test