RESEARCH DESIGN AND METHODOLOGY
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This chapter describes the methodological details of the study. The methodology used in selection of the area of study, sample selection, construction of tool for data collection and analysis of data have been discussed. The chapter includes the following sections:

3.1 Locale of the study
3.2 Selection of villages
3.3 Selection of sample
3.4 Tools of data collection
3.5 Procedure of data collection
3.6 Procedure of analysis of data
3.7 Development of attitude scale to measure the attitude of rural women towards adoption of advanced technologies in agriculture.

3.1 Locale of the study:

Rajasthan is the largest state of India constituting 32 districts. KVKs are established in almost all the district of Rajasthan. The present study was conducted in Kota District of Rajasthan, which was selected purposively due to the involvement of investigator in the extension activities of the district in rural areas. Kota district includes 5 Tehsils- Ladpura, Sangod, Digod, Pipalda and RamganjMandi. Krishi Vigyan Kendra, Kota existed in Ladvura Tehsil and conducted extension activities mostly in nearby villages of the centre of this Tehsil. Sangod and Digod tehsils were also covered by the KVK scientists for imparting the trainings as well as performing other activities. Pipalda and RamgunjMandi tehsils are far away from the centre, therefore KVK activities were not performed very frequently in this area and it was
Fig. 3.1 Map of Kota District
difficult for the farm-women of this area to visit the centre regularly. Keeping in view the accessibility of the researcher as well as considering socio-cultural settings, 10 villages of Ladpura, Sangod and Digod tehsils formed the locale for the study (See fig. 3.1).

3.2 Selection of villages

Training programmes are regularly conducted by the K.V.K. scientists in different villages according to priority of need and interest of the villagers. Since it was not possible to cover all the villages, 10 villages of 3 tehsils Ladpura, Sangod and Digod where K.V.K. programmes were conducted regularly were selected for the study. In those villages where K.V.K. scientists visited the villages for Lectures, Front line demonstrations, Field days, Kisan-goshthi, Farmers’ day and those villages from where women came to attend the programme organized by K.V.K, Kota, were the main criteria for the selection of area for the study. K.V.K. scientists were contacted to know the list of villages where the selected programme for women were conducted or in operation at least for the past 4 years (1996–1999). Therefore total number of villages was 10, namely Borkheda, Jagannathpura, Bheempura, Udpuria, Girdharpura, Dhakhadkhedi, Deogad, Sangod, Manpur and Goverdhanpura.

3.3 Selection of sample:

A list of the women who attended training programme of different disciplines organized by K.V.K. was obtained from the centre. Those women have attended at least 3 training programme of KVK were selected for the study. K.V.K. and other agricultural departments organized some extension programme jointly. They conducted some general and some specific training for various disciplines. Similarly on- campus and off-campus trainings were conducted by the K.V.K. During the year
Fig. 3.2 Total Number of Trainings Organized During the Year 1996-99

Fig. 3.3 Farm - Women Trained by the Centre During 1996-99

- Agronomy
- Animal Production
- Home Science
- Fisheries
- Agricultural Engineering
- Horticulture
1996-1999, number of on-campus and off campus trainings conducted were as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Total number of trainings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>15</td>
</tr>
<tr>
<td>1997</td>
<td>51</td>
</tr>
<tr>
<td>1998</td>
<td>46</td>
</tr>
<tr>
<td>1999</td>
<td>64</td>
</tr>
<tr>
<td>Total</td>
<td>176</td>
</tr>
</tbody>
</table>

These trainings were conducted through the scientist of different disciplines- Agronomy, Horticulture, Agriculture Engineering, Fisheries, Home science and Animal Production. It included the trainings of Extension Functionaries & in-service personnel's and Sponsored Trainings organized by the other agricultural departments. In these total 176 trainings, women trainings were also included. During the year 1996-1999, female participation in the trainings was, 163, 248, 366 and 407 respectively constituting totally 1184 women.

Table 3.1 Number of farm-women trained by K.V.K. Kota during the year 1996-1999.

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Agronomy</td>
<td>48</td>
<td>125</td>
<td>14</td>
<td>105</td>
<td>292</td>
<td>76</td>
</tr>
<tr>
<td>2</td>
<td>Horticulture</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>35</td>
<td>35</td>
<td>9</td>
</tr>
<tr>
<td>3</td>
<td>Agricultural Engineering</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>17</td>
<td>17</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>Fisheries</td>
<td>-</td>
<td>-</td>
<td>72</td>
<td>139</td>
<td>211</td>
<td>55</td>
</tr>
<tr>
<td>5</td>
<td>Home Science</td>
<td>115</td>
<td>123</td>
<td>192</td>
<td>49</td>
<td>479</td>
<td>125</td>
</tr>
<tr>
<td>6</td>
<td>Animal Production</td>
<td>-</td>
<td>-</td>
<td>88</td>
<td>62</td>
<td>150</td>
<td>39</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>163</td>
<td>248</td>
<td>366</td>
<td>407</td>
<td>1184</td>
<td>308</td>
</tr>
</tbody>
</table>
26 percent of women were selected from each discipline by stratified random sampling to have a representative sample. Women from Extension functionaries & other agricultural departments were considered as Agronomy trainers. Care was taken to select only those women who attended at least 3 training programmes of K.V.K. A total of 308 trained women constituted the final sample of the study.

3.4 Tool of data collection:

A structured interview schedule was used as a tool of data collection. The interview schedule was developed on the basis of review of literature, pilot study and after discussion with the organizers of women trainings. It was prepared considering the content taught during the training.

Schedule was divided into the following sections based on the objectives of the Study:

a. Profile of learners: This section elicited the information on age, educational level, marital status, type and size of the family and land holdings of the women.

b. Information related to trainings: This part included the awareness, attendance and regularity of the women in attending K.V.K. programmes, mass media exposure, contacts with experts, methods, literature and audio-visual aids used during trainings, perceived needs for advanced technologies of agriculture and role of women in decision making.

c. Impact of trainings: this part was prepared separately for each discipline which included 3 parts:

(I) Gain in the knowledge of farm- women.

(II) Adoption of advanced technologies by farm- women and

(II) Improvement in the skills of farm- women after attending the trainings of different disciplines
Before pilot study the interview schedule was sent to the experts, professors of C.P. College of Agriculture, G.A.U. Sardarkrushinagar, Faculty of Home Science M.S.U. Baroda, Dharwad Agricultural University and Department of Home Science, Rajasthan University Jaipur, for checking the clarity of statements and validity of subject matter content in the interview schedule. Some modifications were made in the light of suggestions received in the clarity of headings, language and organization of questions. The schedule thus prepared was pre-tested in 5 different villages of Kota District to test its validity and reliability. Based on the feedback of pre-testing, the interview schedule was remodified.

3.4.1 Reliability

In the present study the “Split halves method” was used to find out the reliability of the scale. The items were divided into equal halves with odd numbered statements and even numbered statements in the order. These were administered to 6 respondents separately, which were not included in the final sample. Having obtained the two sets of scores for each of the respondents co-efficient of correlation (reliability of co-efficient) between the two sets of scores was calculated which was found to be significant \( r = 0.82 \). The reliability co-efficient thus obtained indicated the internal consistency of the tool for the study.

3.5 Procedure of data collection

The data was collected during the year 2000-2001. Selected farmwomen were contacted in groups and explained the purpose and importance of study to obtain reliable information. The data was then collected by administering the indepth interview schedule to women individually, supplemented by group and individual discussion.

3.6 Statistical Analysis of Data:

The data collected by administering the interview schedule was tabulated, classified, analyzed and given statistical treatments. The data were processed on
manual and electronic computer. The hypotheses were tested and interpretations were drawn up in light of objectives of the study.

3.6.1 Frequencies and Percentage

Simple comparisons were made on the basis of frequencies and percentage.

3.6.2 Arithmetic mean and Standard deviation

The mean was obtained by dividing total score by the number of respondents.

\[
\bar{X} = \frac{\sum X_i}{n}
\]

Where \( \bar{X} \) = Arithmetic mean of the sample
\( \sum X_i \) = Sum of all the observations
\( n \) = Total number of respondents in a sample.

Standard deviation was obtained by square root of average of the square deviation from the mean.

\[
sd = \sqrt{\frac{\sum (X_i - \bar{X})^2}{n - 1}}
\]

Where \( sd \) = Standard deviation
\( X_i \) = Individual score
\( \bar{X} \) = Mean
\( n \) = Total number of respondents

The technique (\( \bar{X} + Sd \)) was used for the classification of the respondents into different categories as high, medium and low. The maximum and minimum score limit was computed as below.

<table>
<thead>
<tr>
<th>Categories</th>
<th>Score limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. High</td>
<td>( \bar{X} + sd )</td>
</tr>
<tr>
<td>2. Medium</td>
<td>In between upper and lower</td>
</tr>
<tr>
<td>3. Low</td>
<td>( \bar{X} - sd )</td>
</tr>
</tbody>
</table>
3.6.3 Pearson’s Co-efficient of Correlation

Pearson’s product moment correlation was computed to find out the zero order correlation to measure the degree of association between the knowledge, adoption, improvement in skill and set of independent variables. Further each of the independent variables and the dependent variables by employing the following formula.

\[ r_{xy} = \frac{N \sum_{xy} - \sum_{x} \sum_{y}}{\sqrt{[N \sum_{x^2} - (\sum_{x})^2][N \sum_{y^2} - (\sum_{y})^2]}} \]

Where

\( \sum_{xy} \) = corrected sum of products between X & Y.
\( \sum_{x^2} \) = corrected sum of square for X variable.
\( \sum_{y^2} \) = corrected sum of square for Y variable.
\( r_{xy} \) = correlation co-efficient.
\( n \) = Total number of observation.

Further to find out the degree of freedom formula used was: \( n - 2 \)

Where

\( n \) = total number of observations

3.6.4 Stepwise regression

Finding significant relationship between variables is not the same as ascertaining the relative importance of each of these variables in explaining the dependent variable. The magnitude of simple correlation co-efficient is not generally an accurate indicator because of the effect of other variables that can be readily controlled. However, the stepwise regression technique provides a means by which the contribution of each independent variable to change in the dependent variable can be estimated. This procedure permits the study of linear relationship between a set of independent variables and a contribution made by each variable entered irrespective of
its actual point of entry into model. Any variable, which provides a non-significant
contribution, is removed from the model. The process is continued until no more
variables will be admitted to the equation. The stepwise regression was conducted as
recommended by Draper and Smith (1966). In the present study, the stepwise
regression analyzed was conducted on computer. The approach used in this
programme for selection of independent variable was according to their importance
and significance. In this model, the regression of y (dependent variable) on all
independent variables \( (x_1, x_2, x_3 \ldots x_k) \) was calculated by the following
way:

The prediction equation for final step was:

\[
Y_i = a + b_1 x_1 + b_2 x_2 + b_3 x_3 \ldots b_k x_k
\]

Where,

\( Y_i \) = Prediction value of independent variable

\( a \) = Intercept value of \( Y \) with all \( X_i \) included in equation

\( b_i \) = Partial regression coefficient of \( Y \) with \( X_i \)

\( X_i \) = Number of independent variables

\( k \) = Number of independent variables included in the equation

\( x_1 \ldots \ldots x_k \) = number of independent variables.

After filling the regression equation, the “t” value for partial regression co-
efficient was tested for their significance.

3.6.5 Testing of regression coefficient

The regression coefficient was further tested for its significance by “t” test. The
formula used for the same was as under –

\[
t = \frac{b_i}{SE \ of \ b_i}
\]
Where \( \text{"t"} = \text{Calculated test value} \)

\[ bi = \text{Partial regression coefficient} \]

\[ \sum Y^2, \sum X^2, \sum XY \text{ and "n" possessing visual meaning.} \]

The calculated value of \( \text{"t"} \) was further compared with critical value (table value) at 0.05 and 0.01 level of significance. The prediction equation for set of independent variables by which total variation accounted was also calculated.

### 3.6.6 Path Analysis

Path analysis adopting multivariable path model as suggested by Deway and Land (1969) was used to isolate the direct, indirect and substantial efforts of impact and 11 independent variables on dependent variables. Path efforts were obtained by solving the simultaneous equation setup for the purpose using the correlation matrix. Considering \( X \) independent variable to be influencing the dependent variable, the simultaneous equation would be:

\[ ryxi = Pyxi + n \quad ryxi \quad pyxj \]

where,

\[ \sum_{j} = 1 \]

\( ryxi \) is the correlation co-efficient of \( Xi \) with \( y \)

\( pyxi \) is the direct effect and each of the other terms in the equation is an indirect effect.

### 3.7 Development of attitude scale:

The attitude scale was developed to find out the attitude of the farm-women towards adoption of advanced technologies of agriculture (Appendix – C). The scale
consisted 38 statements to judge the attitude of the farm- women. Those women have attended at least 3 training programme of KVK and were regular throughout the training were selected as the sample for finding out their attitude towards adoption of advanced technologies. 10 % of total sample constituting the 30 farm- women were selected for the sample to judge their attitude.

For analysis of this scale mean and sd was found out. The technique ($\bar{X} + Sd$) was used for the classification of the respondents into different categories as Highly Favourable, favourable and Not favourable. The maximum and minimum score limit was computed as below.

<table>
<thead>
<tr>
<th>Categories</th>
<th>Score limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Highly Favourable</td>
<td>$\bar{X} + Sd$</td>
</tr>
<tr>
<td>2. Favourable</td>
<td>In between upper and lower</td>
</tr>
<tr>
<td>3. Less Favourable</td>
<td>$\bar{X} - Sd$</td>
</tr>
</tbody>
</table>

Analysis of the result is described in the following chapters.
RESULTS AND DISCUSSION
Results and discussion

The main objective of the present investigation was to study the impact of the trainings through knowledge gain, adoption of advanced technologies and improvement in the skills of the farm-women after attending the trainings organized by Krishi Vigyan Kendra, Kota. The study focused on the socio-personal profile, the effectiveness of trainings, their participation in decision making and the perceived needs of farm-women for the advanced technologies. The results of the study have been presented here in the following chapters.

- Socio-personal profile of the farm women.
- Training and its effectiveness as perceived by the farm-women.
- Perceived needs and attitude of farm-women towards advanced technologies of agriculture.
- Decision making pattern in the family.
- Impact of the trainings.