3. RESEARCH METHODOLOGY

The methodological plan of the proposed study has been discussed under the following sub-heads.

1. LOCALE OF THE STUDY
2. RESEARCH DESIGN
3. SAMPLING TECHNIQUES
4. VARIABLES AND THEIR MEASUREMENT
5. PRE-TESTING OF INTERVIEW SCHEDULE
6. DATA COLLECTION
7. STATISTICAL ANALYSIS

3.1 LOCALE OF THE STUDY

The study was conducted purposively in Bulandshahr district of Uttar Pradesh. Besides, this:

1. The researcher himself belongs to Meerut, U.P. is well conversant with local dialects, local people and their culture. This was enabled to him to collect reliable and authentic information, so as to make the study more credible and trustworthy.
2. Scanty information is available on this aspect; as such, no studies have been carried out so far in this locality.

3.1.1 HISTORICAL BACK GROUND

The history of Bulandshahr begins even before 1200 B.C. This region is nearer to the capital of Pandavas - Indraprasth and Hastinapur. After the decline of Hastinapur, Ahar which is situated in the north east of district Bulandshahr became an important place for Pandavas. With passage of time the king Parma made a fort on this part of region and a king named Ahibaran laid the foundation of a tower called Baran (Bulandshahr). Since it was perched on a highland it came to be known as high city which was translated into parsian language as Bulandshahr. At present this is called by this name.

3.1.2 GEOGRAPHICAL SITUATION

The District of Bulandshahr is in Meerut region of Utter Pradesh located between Ganga and Yamuna rivers. This is situated between 28.4° South and 28.0° North latitude, and between 77.0° and 78.0° longitudes. The District is about 84 km in length and 62 km is breadth. The district is 237.44 meters above sea level. The river Ganga in the east separates this district from Moradabad and Badaun district and in the west river Yamuna separates the district from Haryana state and Delhi. In the North of district is Ghaziabad and in south east are the borders of Aligarh district. The geographical area of the district is 4353 sq km which is about 1.48 percent of the total Uttar
Pradesh area. The urban area of the district is 122.8 sq km and rural area as 4230.2 sq km. This district is near to Delhi and is in National capital region.

3.1.3. CLIMATE

The climate of the district is characterized by extreme aridity in the summer and cold during winter. In summer, the highest day temperature has been recorded to be 43° C while nights are cool. Summer spans from March to June. The rainy season generally starts in the last week of June and runs up to September. During this period, there are high levels of humidity. Winters are cold with little rainfall. The minimum temperature during the winter was recorded to be 0.0° C in the month of January (Statistical Bulletin of UP 2006-07).

3.1.4 AGRICULTURE

Bulandshahr is an important agricultural district. It has undergone green revolution. Sugarcane, wheat, maize and potato grow in abundance. State government has declared fruit belt in syana area. Mango orchards are located in the area. White revolution in the form of milk production is an important activity in the district.
3.1.5 LAND UTILIZATION

The land utilization pattern of study area is depicted in table-3.1. It was clear that 81.57 percent of total geographical was under cultivation and use of land other than agriculture was 10.97 percent in the study area. Whereas area under forest was observed 2.14 percent and area under saline and other uncultivable was about 2 percent. The area under total fallow was about 1.50 percent and land under saline and other uncultivable was 1.95 percent in the study area of Bulandshahr.

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Particulars</th>
<th>Area (ha)</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Forest</td>
<td>7793.00</td>
<td>2.14</td>
</tr>
<tr>
<td>2</td>
<td>Cultivable waste land</td>
<td>4775.00</td>
<td>1.31</td>
</tr>
<tr>
<td>3</td>
<td>Current fellow</td>
<td>4641.00</td>
<td>1.27</td>
</tr>
<tr>
<td>4</td>
<td>Other fellow land</td>
<td>1023.00</td>
<td>0.28</td>
</tr>
<tr>
<td>5</td>
<td>Saline and uncultivable land</td>
<td>7105.00</td>
<td>1.95</td>
</tr>
<tr>
<td>6</td>
<td>Others than agriculture</td>
<td>40030.00</td>
<td>10.97</td>
</tr>
<tr>
<td>7</td>
<td>Grazing land</td>
<td>940.00</td>
<td>0.26</td>
</tr>
<tr>
<td>8</td>
<td>Orchards, trees, bushes</td>
<td>951.00</td>
<td>0.26</td>
</tr>
<tr>
<td>9</td>
<td>Cultivable land</td>
<td>297716.00</td>
<td>81.57</td>
</tr>
<tr>
<td>10</td>
<td>Total area</td>
<td>364974.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Source: Statistical bulletin of districts (year 2006-07)
3.1.6 IRRIGATION

Planning for land use has to be properly integrated with the planning of irrigation facilities, which is important for increasing land productivity. The cent-percent area is under irrigation. The source wise irrigated area is given in table-3.2, which reveals that the main sources of irrigation in the area were private tube well (71.62%), well (15.43%) and canals (11.62%).

Table-3.2: Area under irrigation sources

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Irrigation sources</th>
<th>Area (ha)</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Well</td>
<td>42479</td>
<td>15.43</td>
</tr>
<tr>
<td>2</td>
<td>Govt. Tube well</td>
<td>3003</td>
<td>1.09</td>
</tr>
<tr>
<td>4</td>
<td>Private tube well</td>
<td>197189</td>
<td>71.62</td>
</tr>
<tr>
<td>5</td>
<td>Others</td>
<td>672</td>
<td>0.24</td>
</tr>
</tbody>
</table>

Source: Statistical bulletin of districts (year 2006-07)
3.1.7 CROPPING PATTERN

The cropping pattern in a region is determined by a large number of geographical and ecological factors like soil, rainfall, climate, temperature, topography, etc. Besides relative profitability of the different crops, in a subsistence-oriented economy like ours, the needs of domestic consumption act as a major factor in deciding the cropping pattern particularly on small and medium land holdings. The area (hectare and percent) under major crops was given in table 3.3.

Table-3.3: Area under major crops

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Major crops</th>
<th>Area( ha)</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Oil seeds</td>
<td>9129</td>
<td>2.25</td>
</tr>
<tr>
<td>2</td>
<td>Cotton</td>
<td>333</td>
<td>0.08</td>
</tr>
<tr>
<td>3</td>
<td>Pulses</td>
<td>18517</td>
<td>4.56</td>
</tr>
<tr>
<td>4</td>
<td>Maize</td>
<td>58921</td>
<td>14.50</td>
</tr>
<tr>
<td>5</td>
<td>Sugarcane</td>
<td>52796</td>
<td>12.99</td>
</tr>
<tr>
<td>6</td>
<td>Wheat</td>
<td>188942</td>
<td>46.49</td>
</tr>
<tr>
<td>7</td>
<td>Paddy</td>
<td>55960</td>
<td>13.77</td>
</tr>
<tr>
<td>8</td>
<td>Other crops</td>
<td>21835</td>
<td>5.37</td>
</tr>
</tbody>
</table>

Source: Statistical bulletin of districts (year 2006-07)
It is evident from the table 3.3 that 46.49 percent area was under wheat crop followed by maize which covered 14.50 percent area in the study area. The sugarcane was cultivated on about 13 percent and paddy was grown on 13.77 percent land in the study area. Similarly area under pulses and oil seeds was 4.56 and 2.25 percent area respectively.

**Table- 3.4: Average crops yield in the area**

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Crops</th>
<th>Yield (q/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Paddy</td>
<td>22.96</td>
</tr>
<tr>
<td>2</td>
<td>Wheat</td>
<td>34.44</td>
</tr>
<tr>
<td>3</td>
<td>Barley</td>
<td>27.89</td>
</tr>
<tr>
<td>4</td>
<td>Jowar</td>
<td>8.01</td>
</tr>
<tr>
<td>5</td>
<td>Maize</td>
<td>15.59</td>
</tr>
<tr>
<td>6</td>
<td>Urd</td>
<td>4.77</td>
</tr>
<tr>
<td>7</td>
<td>Moong</td>
<td>7.33</td>
</tr>
<tr>
<td>8</td>
<td>Masoor</td>
<td>7.06</td>
</tr>
<tr>
<td>9</td>
<td>Gram</td>
<td>8.46</td>
</tr>
<tr>
<td>10</td>
<td>pea</td>
<td>11.67</td>
</tr>
<tr>
<td>11</td>
<td>Pigeon pea</td>
<td>8.32</td>
</tr>
<tr>
<td>12</td>
<td>Mustard</td>
<td>12.04</td>
</tr>
<tr>
<td>13</td>
<td>Sugarcane</td>
<td>568.4</td>
</tr>
<tr>
<td>14</td>
<td>Cotton</td>
<td>1.69</td>
</tr>
</tbody>
</table>

**Source:** Statistical bulletin of districts (year 2006-07)
3.2 RESEARCH DESIGN

Research design is the plan, structure and strategy of investigation conceived so as to obtain answer to the questions. The design explains us, what observations to make and how to make, and analyse the quantitative representation of the observations. It also indicates as to, what types of statistical analysis are to be applied for analysis the data.

The present study was an ‘Exploratory’ type of survey based research design. Accordingly after a thorough and meaningful formulation of the problem, specific objectives were set to provide the basis for the enquiry. In the light of these objectives the scope of the study was delineated and techniques of the investigation was adopted, tools used and the pattern of statistical analysis followed was decided as per the need of the study.

3.3. SAMPLING TECHNIQUES

3.3.1 SELECTION OF VILLAGES

The study was conducted in the areas of four operating sugar mills, i.e. Aguta Sugar mill in Aurangabad, Sabitgarh Sugar Mill in Jhangirpur, Kisan Sahakari Sugar Mill in Anoopshahr, Panniji Sugar Mill in Bulandshahr district. A List of villages for each Sugar Mill was made and from the list of villages, three villages from each sugar mill was selected randomly.
3.3.2 SELECTION OF RESPONDENTS

After the selection of the villages, a preliminary survey was conducted in the selected villages to know the total number of farm families falling in different land holding categories. From each category, a proportionate random sample of respondents was selected, for making the sample size of 15 farmers from each village. The respondents of the study were selected those who were the sugarcane cultivator since last 10 years. In total, there are 12 villages and 180 respondents in this study.

Table-3.5: Sampling plan and distribution of respondents

<table>
<thead>
<tr>
<th>So. No.</th>
<th>Name of villages</th>
<th>Land holding categories</th>
<th>Total respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Marginal</td>
<td>Small</td>
</tr>
<tr>
<td>1</td>
<td>Ramgarh</td>
<td>08</td>
<td>04</td>
</tr>
<tr>
<td>2</td>
<td>Lakhaoti</td>
<td>09</td>
<td>03</td>
</tr>
<tr>
<td>3</td>
<td>Moondhi Bakapur</td>
<td>07</td>
<td>05</td>
</tr>
<tr>
<td>4</td>
<td>Khawajpur</td>
<td>10</td>
<td>03</td>
</tr>
<tr>
<td>5</td>
<td>Agora</td>
<td>06</td>
<td>08</td>
</tr>
<tr>
<td>6</td>
<td>Jamka</td>
<td>12</td>
<td>03</td>
</tr>
<tr>
<td>7</td>
<td>Malakpur</td>
<td>10</td>
<td>04</td>
</tr>
<tr>
<td>8</td>
<td>Manrajpur</td>
<td>12</td>
<td>02</td>
</tr>
<tr>
<td>9</td>
<td>Khudadia</td>
<td>10</td>
<td>03</td>
</tr>
<tr>
<td>10</td>
<td>Raipur</td>
<td>08</td>
<td>04</td>
</tr>
<tr>
<td>11</td>
<td>Umrala</td>
<td>06</td>
<td>07</td>
</tr>
<tr>
<td>12</td>
<td>Dhanrawali</td>
<td>06</td>
<td>06</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>104</td>
<td>52</td>
</tr>
</tbody>
</table>
3.4 VARIABLES AND THEIR MEASUREMENT

For any study undertaken in social science research, it is mandatory to precisely mention concepts and measurement procedures. In the present investigation, relevant variables were selected after extensive review of literature on scientific / adoption gaps and constraints analysis of sugarcane cultivation, and intensive discussion with the experts. Keeping in view, the theoretical background of different concepts and objectives of the investigation, the proposed list of selected variables and their empirical measurements is presented in Table 3.6 the operational definitions of these selected variables and measurement methods have been detailed under the following sub-heads:

Table-3.6: List of selected variables and their measurement

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>VARIABLES</th>
<th>MEASUREMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>INDEPENDENT VARIABLES</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Age</td>
<td>Schedule developed</td>
</tr>
<tr>
<td>2</td>
<td>Education</td>
<td>Trivedi Scale (1963)</td>
</tr>
<tr>
<td>3</td>
<td>Caste</td>
<td>Schedule developed</td>
</tr>
<tr>
<td>4</td>
<td>Family type</td>
<td>Direct questioning</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>5</td>
<td>Family size</td>
<td>Direct questioning</td>
</tr>
<tr>
<td>6</td>
<td>Age at Marriage</td>
<td>Schedule developed</td>
</tr>
<tr>
<td>7</td>
<td>Family background (Experience)</td>
<td>Schedule developed</td>
</tr>
<tr>
<td>8</td>
<td>Cropping intensity</td>
<td>Schedule developed</td>
</tr>
<tr>
<td>9</td>
<td>Annual Farm Income</td>
<td>Schedule developed</td>
</tr>
<tr>
<td>10</td>
<td>Farm power &amp; Implements</td>
<td>Schedule developed</td>
</tr>
<tr>
<td>11</td>
<td>Size of Land</td>
<td>Schedule developed</td>
</tr>
<tr>
<td>12</td>
<td>Material possession</td>
<td>Schedule developed</td>
</tr>
<tr>
<td>13</td>
<td>Milch cattle</td>
<td>Schedule developed</td>
</tr>
<tr>
<td>14</td>
<td>Social participation</td>
<td>Schedule developed</td>
</tr>
<tr>
<td>15</td>
<td>Mass media exposure</td>
<td>Schedule developed</td>
</tr>
<tr>
<td>16</td>
<td>Constraints faced by the farmers</td>
<td>Schedule developed</td>
</tr>
</tbody>
</table>

## II DEPENDENT VARIABLES

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>Extent of Knowledge and Adoption</td>
<td>Schedule developed</td>
</tr>
<tr>
<td>18</td>
<td>Knowledge and Adoption gap</td>
<td>Tripathi scale (1977)</td>
</tr>
</tbody>
</table>
I. INDEPENDENT VARIABLES

The major focus of the present study was to measure the extent of technological gap in relation to sugarcane cultivation. Yet it appeared pertinent to have additional ancillary information about same factors that may have bearing on the variation in the knowledge and adoption. Following were the independent variables, and data were collected for bringing out their relationship and contribution in explaining variability in knowledge and adoption gap in relation to adoption gaps and constraints analysis of sugarcane cultivation.

3.4.1 AGE

It refers to the chronological age of the farmer rounded to the nearest whole number, at the time of investigation. It was ascertained by schedule developed. Farmers were categorized into young, middle and old age categories using mean and standard deviation.

1. Young  = up to 35 years

2. Middle  = 35.01- 50 years

3. Old     = above 50 years
3.4.2 EDUCATION

It refers to the total number of years spent by the farmers in the formal education. This variable was measured by applying Trivedi’s scale (1963). Farmers were categorized into following category by using the scale.

1 Illiterate 0
2 Read only 1
3 Read and write 2
4 Primary level 3
5 Middle level 4
6 High school 5
7 Intermediate 6
8 Graduate and above 7

3.4.3 CASTE

It refers to the social classification of farm family in term social classes whose membership is determined solely by birth and between which there is no vertical social mobility. It was measured by schedule developed and the respondents were categorized and assigned scores as follows:-
(a) Schedule caste/tribe 1
(b) Backward caste 2
(c) General caste 3

3.4.4 FAMILY TYPE

It refers to the number of individuals living under the same roof and sharing kitchen together in a household. It was measured in two categories i.e. Nuclear and joint. One score for nuclear and 2 for joint family were accorded.

**Nuclear family** is composed of member of one person including his wife and children.

**Joint family** refers to one, which is contributed of two or more brothers’ family sharing kitchen together in a same roof.

3.4.5 FAMILY SIZE

Operationally the family size refers to the total members in the family including dependents. This may also influence the decision-making and ultimately the diversification and adoption behaviour of respondents;
Respondents were grouped into three categories as follow:

1. Small - Less than 5 members
2. Medium - 5 to 13 members
3. Large - More than 13 members

3.4.6 AGE AT MARRIAGE

It refers to the chronological age of the respondents rounded to the nearest whole number, at the time of marriage. It was ascertained by schedule developed. Sugarcane growers were categorized into following three groups by using existing marriage system in the locality.

1. Early age = Up to 20 years
2. Optimum age time = Between 21 to 25 years
3. Late age = More than 25 years

3.4.7 FAMILY BACKGROUND / EXPERIENCES

It refers to the active involvement of an individual in a profession and main earning is coming from profession (concerned work). Here, family background is considered as learning and doing process in the field of sugarcane cultivation in terms of year of experiences. It was measured by schedule developed.
The farmers were classified into 3 categories:

1. Low - Less than 15 years
2. Medium - 15 to 36 years
3. Large - More than 36 years

**3.4.8 CROPPING INTENSITY (CI)**

The cropping intensity of each respondent was calculated as per the following formula:

\[
\text{Cropping intensity (%) } = \frac{\text{Cropped area}}{\text{Total area}} \times 100
\]

1. Up to 100 percent CI = 1
2. 101-150 percent CI = 2
3. 151 – 200 percent CI = 3
4. More than 200 percent CI = 4

**3.4.9 ANNUAL FARM INCOME**

It referred to the total income of the family of respondents from various occupation sources within a year. This had rupee as unit. The respondent was asked for his income in the years 2006-08, respectively.
The respondents were categorized into following categories, using the income data for the year 2006-08.

i) Low - Less than Rs.50000/-

ii) Medium - Rs.50000/- to 100000/-

iii) High - More than 100000/-

3.4.10 FARM POWER AND IMPLEMENTS

The existing tools and implements were assessed operation wise. For all the farm operations, the farmers were asked about the name of implements they were having. On the basis of their traditional or improved type, the implements were scored.

Traditional = 1

Modern = 2

3.4.11 SIZE OF LAND/ LAND HOLDING

It refers to the actual number of acreage of land owned by the farmer. It was ascertained by schedule developed. Households were categorized into the following categories on the basis of standard criteria.
1. Marginal farmers = up to 2.50 acre
2. Small farmers = 2.51-5.00 acre
3. Medium farmers = 5.01 - 10.00 acre
4. Large farmers = More than 10.00 acre

3.4.12 MATERIAL POSSESSION

Material Possession refers to the total number of household including luxury items, possessed by the farm family. A schedule was developed to measure the response on each household items and on the basis of items respondents were grouped into three categories as follow:

1. Low - Less than 10 numbers
2. Medium - 10 to 20 numbers
3. High - More than 20 numbers

3.4.13 MILCH CATTLE /HERD SIZE

It refers to the total number of cattle and buffalo including young ones possessed by the farmers at the time of investigation. The data were collected with the help of a schedule developed for this purpose and it was measured by direct questioning. Respondents were categorized into small, medium and large herd size on the basis of mean and standard deviation.
1. Small = Less than 5 animals
2. Medium = 5 to 14 animals
3. Large = More than 14 animals

3.4.14 SOCIAL PARTICIPATION

It refers to the involvement of an individual in any formal as well as informal social organization/institution of a member or office bearer. It was measured by schedule developed and on the basis of mean and standard deviation; farmers were classified into four categories.

1. No-participation = 0
2. Low = Less than 2 or up to 1
3. Medium = 2
4. High = More than 3

3.4.15 MASS MEDIA EXPOSURE

Mass media exposure is the degree of utilization of mass media, viz., radio, television, newspaper, etc. by farmers. This was measured by using the schedule developed for this purpose. The farmers were scored on three point continuum scales, namely, regularly, sometimes and never. The scoring system followed was 3, 2, and 1 respectively. Farmers were
categorized into low, medium and high mass media exposure on the basis of mean and standard deviation. The score ranged in between 10-30. Respondents were assigned three categories on the basis of mean and standard deviation.

1. Low = Less than 18
2. Medium = 18 to 24
3. High = More than 24

3.4.16 CONSTRAINTS FACED BY THE FARMERS

The simplest dictionary meaning of constraint (grammatically a noun) are: to compel, to force, to confine, to restrict the motion (a body or particle), to secure by bonds, to restrain, to close tightly, to hold back by force, to violate, to straighten, to oppress, to confine forcibly, to contract, to distress, to limit, to press, to bring into narrow campuses, irresistible force, coercion, restriction of liberty, affliction, compulsion put upon the expression of feelings or behaviour, always implying unnaturalness or embarrassment, repression of natural behaviour; as to have an air of constraint, the act or action of using force or threat of force to prevent or condition an action, the quantity or state of being checked, restricted to avoid or perform some action.
For the present study, it has been operationalised as the certain irresistible forces, which may be of non-availability of inputs and attack of pest and disease, imbalance of plant nutrient, etc. singly or in conjunction with each other and impeding the adoption of recommended sugarcane production practices.

To measure the constraints a schedule contained 6, 5, 5 and 5 statements of constraints related to the aspect of inputs, production, marketing and theoretical know-how was developed, respectively. It was administered to the respondents concerned. They were required to respond to each one of the statements in terms of their agreement on three point continuum schedule, i.e., most serious, serious and least serious. These choices were assigned the score of 3, 2 and 1 respectively. The frequency of each constraints perceived was analysed and on the basis of total obtained mean score the rank was accorded. Higher the score the more severe the constraints as perceived by the respondents, regarding the sugarcane cultivation.

II. DEPENDENT VARIABLE

3.4.17 EXTENT OF KNOWLEDGE AND ADOPTION

(A) KNOWLEDGE

Singh and Singh (1976) defined knowledge as the “totality of understood information possessed by a person”. Bloom et al. (1958) has
defined knowledge test as a test which refers to the behaviour and test situation which emphasises that remembering by recall of ideas, materials and phenomena. English and English (1961) defined knowledge as “the body of understood information possessed by an individual or by a culture”. According to Rogers and Shoemaker (1971), it was a function or a stage of the decision process when the individual is exposed to an innovation’s existence and gains some understanding of how it functions. In the present study it was operationalised as the extent to which information and understanding held by the about the recommended sugarcane production practices in the study areas. The responses were recorded on multiple choices as mentioned in the knowledge schedule. On the basis of overall score, the respondents were classified into three categories on the basis of mean and standard deviation.

1. Low = less than 16

2. Medium = 16 to 30

3. High = More than 30

Extent of knowledge was measured by using following formula:

\[
\text{Extent of Knowledge (\%) } = \frac{\text{Obtainable score}}{\text{Max. Possible Score}} \times 100
\]
(B) ADOPTION

It was operationalised as the degree to which respondents actually use the recommended sugarcane production practices and was measured with help of well-structured schedule. The responses were recorded on multiple choices as mentioned in the adoption schedule. On the basis of overall adoption score, the respondents were classified into three categories on the basis of mean and standard deviation.

1. Low = Less than 16
2. Medium = 16 to 30
3. High = More than 30

Extent of adoption was measured by using following formula:

\[
\text{Extent of adoption (\%)} = \frac{\text{Obtainable score}}{\text{Max. Possible Score}} \times 100
\]

3.4.18. KNOWLEDGE AND ADOPTION GAP

Several researchers measured adoption/technological gap in different ways with reference to agriculture innovations. Tripathi (1977) studied this gap in rice cultivation. He conceived adoption gap as the difference between recommended package of practices and extent of adoption of recommended
practices. Sadamate (1978), Singh and Mathur (1982) also followed the similar approach in rice and bajra cultivation respectively.

For the present study gap refers to the difference between the recommended package of practices of sugarcane cultivation and the actual adoption of these practices by the farmers on their field.

This was measured with the help of the index developed by Tripathi (1977), as given below:

\[
\text{Knowledge/Adoption Gap} = \frac{\text{Recommended practices score} - \text{Knowledge/Adoption score}}{\text{Recommended practices score}} \times 100
\]

On the basis of overall gap score, for each individual farmers on the basis of land holding category results were discussed.

3.5 PRE-TESTING OF INTERVIEW SCHEDULE

The research instrument in the form of a interview schedule were pre-tested by administering the instruments to 35 farmers of village Jhangeerpur and Budaum, which were not included in the study. After getting the responses, necessary modifications in terms of elimination of ambiguous statements, changes or format or presentation of the instruments in the schedule, deleting the monotonous responses etc., were suitably made. Thereby the quality of presentation of the instruments in the field schedule was improved.
3.6. DATA COLLECTION

The data collection from the farmers of twelve villages was done from October 2006 to February 2007. Before administering the schedule, the objectives of the study were explicitly explained and proper rapport was developed. The questions in the schedule were presented in the local dialect assuming that the farmers perceived the questions correctly so as to avoid any interpretational variation of the questions. Only one farmer was interviewed at a time. During the interview, care was taken to keep alive the interest of the farmers. Their experiences constituting constraints were patiently heard. Accordingly, the data were collected from 180 farmers from 12 villages selected for the study. In addition, relevant information particularly suggestions given by the farmers and officials was collected during informal discussions with them.

3.7. STATISTICAL ANALYSIS

The data thus collected were scored, compiled, tabulated and subjected to the following descriptive statistics were processed on electronic computer. The following statistical methods were used in the study:

(i) Percent and frequency: The percent and frequency of each studied item was calculated and a comparison was made by interpreting the results.
(ii) Mean score: It was obtained by dividing total score of each statement by total number of respondents.

\[
\text{Mean score} = \frac{\text{Total score of each statement}}{\text{Total number of respondents}}
\]

(iii) Mean per cent score: It was computed by multiplying total obtained score of the respondents by 100 and divided by the maximum obtainable score.

\[
\text{Mean per cent score} = \frac{\text{Total score obtained}}{\text{Maximum obtainable score}} \times 100
\]

(iv) Rank: Ranks were accorded in descending order according to the mean per cent score obtained. This was used to find out the constraint’s severity in order of priority.

(v) Standard deviation: The standard deviation was used for categorization of respondents in three groups on the basis of observed age, education, knowledge, adoption, constraints perceived in adoption of sugarcane cultivation practices. The formula of standard deviation is as follows:

\[
SD = \sqrt{\frac{\sum X_i^2}{n} - \left(\frac{\sum X_i}{n}\right)^2}
\]

Where,

- \(SD\) = Standard deviation
- \(\sum X_i^2\) = Sum of square of the observation
- \(\sum X_i\) = Sum of value of the observation
- \(n\) = Number of respondents
(vi) Spearman’s correlation coefficient

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

Where:
- \( N \) = number of pairs of scores
- \( \Sigma xy \) = sum of the products of paired scores
- \( \Sigma x \) = sum of x scores
- \( \Sigma y \) = sum of y scores
- \( \Sigma x^2 \) = sum of squared x scores
- \( \Sigma y^2 \) = sum of squared y scores

3.8. FACILITIES UTILISED FOR THE RESEARCH WORK

Since the study was mostly related to fieldwork, no special facility such as laboratory work was used. However for consultation of relevant literature, Library of C.C.S.University, Meerut, Bundelkhand University, Jhansi, I.G.F.R.I. Jhansi, P.D.C.S.R Modipuram, Meerut, and I.A.R.I, New Delhi were fully utilized.