3. RESEARCH METHODOLOGY

The present study was carried out to study the adoption of improved mango cultivation practices among orchardists of western Uttar Pradesh sequential methodology or research was followed which included following headings:

- Research design
- Theoretical frame work of the study
- Variables
- Operational definitions
- Development of instrument
- Selection of sample
- Method of data collection
- Analytical frame work

RESEARCH DESIGN

This study was an attempt to study the knowledge level of mango orchardists along with the extent of adoption of improved mango cultivation practices among them. The variables and procedures were described accurately and completely so that the study could be replicated by other researchers and extension workers. The variables selected for describing respondent's age, education level, caste, family labour available, socio-economic status, history of orchard, layout and location of orchard, inter crops grown for annual farm income, orchard management practices, risk orientation, mass media exposure, training received, reasons and
constrains faced in the adoption of new practices, knowledge of orchardists and extent of adoption of improved cultivation practices.

THEORETICAL FRAME WORK OF THE STUDY

An attempt was made to systematically conceptualize the research problem in the light of major objectives of the study.

![Diagram showing the theoretical framework of the study]

Fig. 1: Theoretical frame work of the study
It was hypothesized that there was low production of mangoes due to low adoption of improved cultivation practices. In the area of study mostly traditional practices of mango cultivation were being followed. These traditional mango cultivation practices need high inputs and produced low output. It was therefore the need for improved mango cultivation practices was arise. It was further hypothesized that the adoption level of new and improved mango cultivation practices by the orchardists was very low. This low level of adoption was associated with the lack of proper and sufficient knowledge of new techniques and risk factors along with various constraints faced by the orchardists.

**VARIABLES**

Variables were the conditions or characteristics that the researchers manipulate, controls and observes. The variables under this study were categorized in two groups viz., dependent variables and independent variables.

**Independent variables**
- Personal variables (like age, caste, educational level etc.)
- Family variable (like family size, composition, type, income etc.)
- Situational variables (like history, layout, location of orchard and risk orientation constraints)

**Dependent variables**
- Knowledge level of orchardists regarding mango cultivation.
- Extent of adoption of improved practices
- Knowledge of post-harvest and marketing process

*Fig. 2: Schematic presentation of variables*
DEPENDENT VARIABLES

The dependent variables were the conditions or characteristics that appear, disappear or changes independent variables. In the present study the dependent variables were knowledge of orchardists regarding mango cultivation, extent of adoption of improved practices and knowledge of post-harvest and marketing process.

These dependent variables were measured in terms of present knowledge level of orchardists regarding mango cultivation and following of improved cultivation practices by the orchardists along with the constraints faced by them.

INDEPENDENT VARIABLES

The independent variables were the conditions or characteristics that the experiments manipulated or controlled in his attempt to a certain their relationship to observed phenomena. In the present study the extent of adopting and knowledge level of orchardists regarding improved mango cultivation practices etc. was measured in terms of following independent variables.

AGE

The age factors was thought to be affecting the extent of adoption and knowledge level of the orchardists regarding mango cultivation practices along with this it was also associated with the risk orientation capability of the farmers. So it was included in the study. Data for age was collected by making four groups, which were:
(a) Young age group (15-30 years)
(b) Lower middle age group (31-45 years)
(c) Upper middle age group (46-60 years)
(d) Old age group (above 60 years)

EDUCATIONAL LEVEL

Orchardists' decision making power regarding orchard management, risk taking, use of scientific and new technologies etc. were being influenced by his educational level. The data for measuring the education level was collected through following:

(a) Illiterate
(b) Capable of reading and writing
(c) Primary school
(d) Middle
(e) High School
(f) Intermediate
(g) Graduate
(h) Post Graduate and above

FAMILY MEMBER AVAILABLE

The numbers of family members available for doing the jobs related to orchard management was affecting the adoption and use of new technologies. The data for it was collected in terms of number of family members working for the orchards management.
SOCIO-ECONOMIC STATUS

The socio-economic status of the family of the orchardists was found to be a major factor associated with the extent of adoption of new and improved techniques of mango cultivation. It was also directly influenced the risk orienting behavior of the orchardists. So it was taken as independent variable for the study. It was measured in terms of following.

History (Age) of orchard

The age of the orchard was also found to be associated with the enthusiasm and courage of the orchardists to adopt the new techniques of mango cultivation. The history of orchard have been studied in terms of other sub variables like number of mango trees in the orchard, number of bearing mango trees, lay out and location of orchard etc.

Farm machines and implements

It was also taken as an independent variable, which was also affecting the extent of adoption of new mango production techniques. The data related to this variable was collected in terms of number and implements possessed by the orchardists.

Orchard management practices

The management practices followed by orchardists also affected there future planning. It was therefore the data regarding currently followed practices were collected with the help of open
ended questions concerning the orchard management practices followed.

**Post-harvest practices**

It was found that extent of adoption of new technology in mango cultivation was affected by post-harvest practices. The subjective data was open-ended question on marketing practices followed by orchardists.

**Mass media exposure and extension training**

It was influenced the knowledge level of orchardists. Through the mass media the orchardists were getting the exposure and it affected the adoption process of orchardists. The process of adoption of new techniques were also affected by the orchardists participation in extension training. Presence of adequate number of social organization, mass media sources like television, radio, newspapers, farm magazines, journals and other authenticated information sources like extension personnel are very much important to impart knowledge among the orchardists. So both the variables were studies the data related to these were collected in terms of which type of mass media exposure they have got type, number of extension training organized by G.Os and NGOs for orchardists their participation in these trainings etc.
Reasons for adoption of new practices

The adoption of a new cultivation practice was the result of various reasons. To collect the data on it open ended questionnaire was framed and asked to the orchardists.

Constraints faced by farmers

Among the major variables which affected the adoption of new mango cultivation techniques, constraints faced by the orchardists were one of the most important ones. Constraints referred to the items of difficulties by the orchardists in actual adoption of recommended technologies causing technological gap. It also play an important role in adoption of recommended agricultural technologies. The data regarding this was collected with the help of open-ended questionnaire on the subject.

Technological gap

The gap between the individual and the new technology results in poor productivity and mismanagement of the crop. In the present study the technological gap has been measured by assigning score to each practice of mango cultivation.

OPERATIONAL DEFINITIONS

(1) Adoption

The term adoption in the study meant that the farmer have understood the method and followed it.
[2] Orchardists

A farmer owner of an orchard of mango who was doing the business and letting out the procedure in marker.

[3] Decision process

The choice made and implemented in the allocation and utilization of resources in mango cultivation management.

[4] Age

Number of completed years of orchardists life.

[5] Educational status

The level upto which the orchardists had got education.

[6] Occupation

The type of job in which the orchardists was involved.


The nature of job in which the orchardists was involved. It means whether the orchardists was gainfully employed, unemployed or self employed.

Sample farmers

The key informant who could response to the questions pertaining to the study.

Risk orientation

It was referred as the ability of orchardists to take the risk in adopting the new techniques in mango cultivation.
Technological gap

It refers to the degree which and individual exhibited a difference in use of the innovation.

DEVELOPMENT OF INSTRUMENT

Selection of tool and technique

The pre-coded structured interviews schedule was constructed to collect the information on adoption of improved mango cultivation practices among orchardists of western Uttar Pradesh. The whole questionnaire was divided into two parts. Section I of the questionnaire contains the census information regarding mango cultivation of western Uttar Pradesh along with the questions to collect the information about the background characteristics of the orchardists. The necessary required information was collected from secondary sources also. Section second of the questionnaire schedule dealt with the detail information regarding the knowledge level, extent of adoption of improved mango cultivation practices, constraints faced by orchardists etc. The questions to find out the reasons for adopting new practices and constraints faced during the adopting of new mango cultivation practices were also included in this part of schedule. Before constructing the questionnaire, the related literature was, constricted to have an in depth insight in the subject. On the basis of facts studied the schedule was submitted to advisor for content validity and checking of corrections of statements. It was modified in the light of suggestions received
Fig. 4: Map of Bulandshahr district
(Annexure-I). Since the study had to be conducted with farmers, the interview schedule was translated into Hindi languages (Annexure-II).

**SELECTION OF SAMPLE**

**Selection of locale**

The study was carried out in the mango cultivation zones of Western Uttar Pradesh and Uttaranchal. There were seven mango cultivation zones in the state. Among them two zones viz., Behat (district Saharanpur) and Siyana (district Bulandshahr) over promising zones for mango cultivation. These zones were purposively selected for the study because of being easily approachable. From each selected district one community development block was selected, from which five villages were selected from each community development block. Random selection of the five villages from each district was done by the list of villages with mango orchards procured from community development block headquarters. A list of mango orchardists was obtained from village level workers. From the selected villages 10 per cent orchardists from the total number of mango orchardists were selected randomly for the study.

**Sampling design**

The four-stage random sample design was used to select the study area and respondents. At the first stage two mango zones were selected purposively. At the second stage one community development block from each zone was selected. At the third stage 10
villages (5 villages form each block had be selected by random sampling). At the fourth and final stage respondents were selected randomly as per the pre-decided percentage.

Uttar Pradesh

Mango cultivation zones

Bchat zone

District Saharanpur

Sadauli Kadeem block

Five villages

1. Salempur
2. Sadauli Kadeem
3. Fatehullapur
4. Usand
5. Marwa

District Bulandshahr

Siyana block

Five villages

1. Kishaula
2. Siyana
3. Makdi
4. Bara Firozpur
5. Bugrasi

Ten per cent orchardists from each village

Fig. 3: Flow chart of sampling design
ETHOD OF DATA COLLECTION

The data was collected personally by using the interview method on the variables under study. Unit key informant was the orchardists. The time period for data collection was 6 months (i.e., February to July, 2002). The secondary data was also collected from the community development block headquarters research journals, books, bulletin and village level workers.

ANALYTICAL FRAME WORK

The analysis of data aimed at summarizing the findings related to collected data in such a manner that they yielded answers to research questions. The data analysis was planned in terms of categorization, coding tabulation and statistical analysis.

A coding plan was developed to code the information collected through the interview schedule. Code number from each schedule were recorded on the coding sheet. After completion coding, the coded data was transferred from coding sheet to comprehensive table to give a clear picture of the findings. For the analysis of present data descriptive statistics, namely, frequencies, percentages and means were computed. Graphical representation of findings were planned to make it more interesting. The data were also analyzed into average statistical measurement of $\chi^2$ test and coefficient correlation were used to find out the relationship between socio-economic background of mango orchardists and extent of adoption of new technology in mango cultivation.