CHAPTER I

INTRODUCTION

Along with increased outlay on agriculture and augmentation of total agricultural production, agricultural development is interpreted for the present study to mean the process by which the performance of agriculture improves through the adoption of modern inputs and practices. Though many times the term 'modernisation of agriculture' has been used in this analytical study, it has been taken as a synonym of 'agricultural development'. Further, the present study probes into the nature and pattern of agricultural development based on both documentary and empirical evidences. In other words, the study culminates in testing field observations in the framework of theoretical exposition of a number of issues confronted in explaining the understanding what is meant by agricultural development.

Agriculture, being the largest sector, forms the backbone of the Indian economy. It has been a widely accepted view that the economic growth of less developed countries depends heavily upon improving the performance of the agriculture sector. Speedy agricultural development helps the process of economic growth in backward areas in many respects.

By modernising agriculture, agricultural output and income and standard of living of the farm families go up, and a country can establish new industries, provide more employment opportunities, produce nutritious food, earn more foreign exchange and develop all sectors in the economy. Johnston and Mellor\(^2\) classify the contribution of agriculture for economic development under five heads: (i) increased food supply, (ii) rise in agricultural exports, (iii) transfer of labour force from agriculture, (iv) more capital formation, and (v) additional purchasing power. In short, strengthening of agriculture helps over-all development.

Modernisation of agriculture calls for innovation in production, application and use of new techniques and inputs in agriculture. In other words, improvement of agriculture in the modern sense implies the application of science and technology. A rational and scientific approach to agriculture means a break with the traditional ideas and practices associated with agriculture. Dependence on nature has to be replaced by the innovative abilities of man. Natural resources have to be supplemented and augmented through human intelligence. Improvement in agricultural productivity again largely depends upon availability of good quality inputs and proper use of these at the farm level.

In India introduction of modern farm inputs in agriculture was attempted on a massive scale for the first time in some selected areas during the mid-sixties through the Intensive Agricultural District Programme (IADP). In Karnataka, the programme was first taken up in Mandya district at the beginning of the Third Five Year Plan. The main objective of the IADP programme was to speed up agricultural production by providing sufficient supply of improved seeds, fertilizers, irrigation, plant-protection measures, improved implements and other inputs. In recent years, agricultural modernisation has spread over many other areas besides the IADP districts. In other words, there has been a tremendous fillip to the modernisation of agriculture in the country apart from the State of Karnataka.

It is needless to say that use of modern inputs increases agricultural output and yield per hectare. Modern inputs that are used by the farm families in the State are high yielding variety seeds, irrigation, fertilizers and pesticides. The use of these inputs which was slow in the beginning has gained momentum in recent years. For instance, the net area irrigated has increased from 6.4 lakh hectares in 1950-51 to 13.6 lakh hectares in 1980-81, area under HYV seeds which was 0.66 lakh hectares in 1966-67 increased to 24.00 lakh hectares in 1980-81. The same is true in the case of other inputs like fertilizers and pesticides. Even at the national level there is tremendous increase in the use of these inputs. It is significant to note that the role
played by these various strategic agricultural inputs in increasing the production is not uniform. While some of the inputs have shown dramatic results, others have not. The results of the Regression Analysis of the present study reveals that along with HYV seeds, irrigation and fertilizers are also more influencing factors in the output growth. The other factors like organic manure, implements, bullock power, cropping intensity, pesticides etc. have not been so influential.

Taking into consideration the fact that these inputs would continue to be the main springs of increased output in the economy, an attempt is made in the present study to assess the following issues:

(i) Who are the users of these inputs? (Small or medium or big farmers)

(ii) Which are the methods of using these strategic inputs?

(iii) What are the problems of farmers in getting, adopting and using these strategic inputs? and

(iv) In which regions and for what crops are these inputs used?

The main purpose of the study is to investigate as to how and why the use of these strategic inputs are spread over different regions and also to investigate the problems of the farmers connected with the use of the strategic inputs and adoption of recommended practices.
A number of studies have been made to investigate the various aspects of farm level problems and modernization of farming in India. At this juncture, a brief account of their findings seems to be appropriate. While Kafkafi and others have pointed out that the main problem is the want of appropriate supply of water and nutrients to various soil types and crops by the farmers, Rajagopalan and Singh in their study "Adoption of Agricultural Innovations" have clearly held that improper and inadequate instructions to the farmers for the proper doses and application of chemical fertilizers are responsible for serious wrong use of costly inputs and reduction in the farm output.

There are others like Mukhopadhyay, Vyas and Tyagi and others who hold that improper tillage practices, wrong sowing, non-adherence to the recommended doses of seeds, untimely sowing, farmers' ignorance about the availability of certified seeds, etc., are mainly responsible for the poor performance of agriculture.

Savale in his article has pointed out various difficulties faced by farmers for the non-adoption of recommended practices. The reasons for such non-adoption are absence of demonstrations, financial difficulty, non-availability of implements, non-availability of recommended variety of seeds, lack of technical guidance etc.

It is heartening to note that scientists are finding out different varieties of seeds, chemical fertilizers and improved irrigation techniques while the government is also very eager to reach these research findings to farmers. But the problem is that the users of these strategic inputs are facing a number of difficulties like scarcity, adulteration and untimely availability of these inputs.

A more severe problem in the country is the distribution of adulterated HYV seeds. "Complaints of supply of rotten seeds, and sub-standard and misbranded seeds to the farmers have become common in recent years. Last year (1983-84) the farmers in Orissa were dumped with poor quality paddy seeds... several farmers in Uttar Pradesh, Haryana and Rajasthan had difficulty in getting quality bajra seeds. Today the quality of seeds suffers due to a number of reasons, said K.P. A Menon, Chairman, National Seeds Corporation."

---


8. "Sound Legislation but..." The Hindu, 6th Tuesday Nov. 84, p. 17.
Scholars like Desai and others have clearly pointed out that the HYV seeds respond vigorously to heavy doses of fertilizers. But the main constraints on the part of the users of fertilizers is adulteration and non-availability of chemical fertilizers in time.

In the annual seminar of Fertilizer Association of India, it was the unanimous opinion of the delegates that scarcity of supply was a major hurdle in the use of chemical fertilizers. Karnataka State is not an exception to this.

Apart from scarcity and adulteration problems of modern inputs, farm families in India are facing other problems such as crop failure due to diseases and pests, flat taste and quality of HYV products etc. Sivaraman has strongly criticised the quality and taste of HYV products. He points out that quality and taste of some of HYV products like jawar, wheat etc., are not up to the mark. As a result

---


there is less demand for these products. This may adversely affect the area under such crops. Further he observes that many cotton plants dropped as much as 80 per cent of the balls that were formed and much of the ball dropping was really due to attack of various kinds of insects and diseases.

Savale's\textsuperscript{13} empirical study reveals that about 6 per cent of the farmers in Pune district of Maharashtra State have not adopted HYV food crops mainly because of bad quality and taste of such products.

In the field of irrigation again farm families in India are facing innumerable problems. National Irrigation Commission\textsuperscript{14} and National Commission on Agriculture\textsuperscript{15} have pointed out some of the irrigational problems at the farm level. They are: (i) absence of permanent field and main canals, (ii) delay in releasing water to the canals, (iii) excess use of water by the farmers, (iv) water logging and salinity, (v) non supply of timely and sufficient water to the tail-enders, resulting in failure of the standing crops, (vi) inadequate attention to land-levelling and consolidation, (vii) scarcity of water etc.

\textsuperscript{13} Savale R S, Op.cit., 14, p. 204.
A recent micro level study by Mishra and Vivekanand has also pointed out various problems faced by the cultivators in the Tungabhadra (Karnataka) Command Area. They are: (i) seepage, (ii) tail-enders problems, (iii) improper development of canals, (iv) scarcity of water, (v) higher level of land than of water canals, (vi) water logging, etc.

Further, credit supply and extension services are of vital importance for the process of agricultural growth. Unfortunately in our country, the existing credit institutions and extension agencies have failed to provide sufficient credit and extension facilities particularly to schedule caste, schedule tribe and small and marginal farmers. For instance, The National Commission on Agriculture of 1976 observes "over large parts of the country small farmers have been handicapped for want of access to co-operative credit. An important feature of co-operative credit has been its tendency to flow mainly to large cultivators ... Similarly, an analysis of the agricultural financing by the public sector banks ... has also revealed that the farmers having holding above 2.02 hectares got about 74 per cent of the total credit advanced by the banks". An empirical study by


Jakhade also reveals that small and marginal farmers have not benefitted from institutional agencies. As a result, small farmers are lagging behind in the use of modern technologies.

Nor is the performance of Extension Agencies in the developing countries like India satisfactory. For instance, Arnon has observed that "the agricultural extension staff particularly in developing countries are virtually careless, incapable of giving the sophisticated advice worth giving and devoted not to the development of their areas but to their own farms and interests... extension staff work only about five hours... concentrate mainly on a few relatively accessible villages".

The availability of soil testing measures and transportation facilities to the farming community in India also leaves much to be desired. For instance... it has been observed by Mukatkar that... "the total capacity of all soil testing laboratories is for the analysis of 4 million samples per year... considering that there are 70 million farm holdings and an estimated 50 million farmers needing soil testing services, the total capacity of soil testing services developed is still small".


Above all, it is interesting to note that the spread and use of modern farm inputs is not uniform. There is variation in the use of these from region to region, farm to farm, and from crop to crop.

Khan and Tripathy\textsuperscript{21} in their study 'Intensive Agriculture and Modern Inputs' have clearly shown that the percentage of farmers using chemical fertilizers (NPK) has been generally higher in the delta region (irrigated region) than in the upland (dry land) region. In the delta region, according to their study, 90 per cent of the farmers have used NPK whereas in upland region 50.3 per cent have done so. Further, the study also points out that there is considerable variation in the adoption of HYV seeds between these two regions. In the Delta (irrigated region) 45 per cent of the farmers have adopted HYV paddy, whereas in the upland (dry region) only 8.3 per cent of them have done so.

What is more significant is the fact that there is considerable variation in the use of strategic inputs by the farmers belonging to various categories. Dr. Meti's\textsuperscript{22} study on 'Economics of Fertilizer use in Karnataka' reveals that, the per acre application of fertilizers to paddy crop is

\textsuperscript{21} Khan W and Tripathy R N., \textit{Intensive Agriculture and Modern Inputs}, Hyderabad, National Institute of Community Development, 1972, pp. 55-60.

\textsuperscript{22} Meti T K., \textit{Economics of Fertilizer Use in Karnataka} (Unpublished), Dharwad, Karnataka University, 1977, pp. 35-45.
highest in the case of small farmers and lowest in the case of both medium and big farmers. For instance, in the irrigated villages, the average per acre use of fertilizers by small farmers is 110 Kg. whereas the per acre fertilizers use of medium and big farmers is 102 Kg and 105 Kg respectively. A study by Desai and Sharma reveals that there has been a tendency of reduction of rate of application of fertilizers (N) per acre as the size of the farm increases.

It is interesting to note that there is also a variation in the use of inputs, like chemical fertilizers for different crops. For instance, Desai has observed that farmers normally do not apply all the recommended doses and generally apply recommended doses for commercial crops rather than for food crops.

Though the above mentioned studies have been useful in highlighting the different problems of modernization of agriculture in India, by the very nature of their objectives, they have not been able to probe deep into the various problems faced by the farmers in the process of change-over from traditional farming to modern farming. Hence it is felt that


there is a need for in-depth studies at the village and farm family levels to fathom and appraise the intensity of the problems that the farmers face in the use of modern inputs, techniques and practices.

Thus the present study is an humble attempt to make an in-depth analysis of farm level problems in the process of development of agriculture.

OBJECTIVES OF THE STUDY:

From the foregoing paragraphs, it is evident that any study on agricultural development would be incomplete if the role of agriculture in the overall economic development is not studied. When the present study dwells on the development of agriculture in Karnataka State in particular, it is essential to throw sufficient light on how far agriculture is significant in the cause of development of a State such as Karnataka.

The study of agricultural development further necessitates the review of various development programmes that have been undertaken in some Asian countries including India because such comparative study would throw some useful light on those already undertaken in the Karnataka State and those to be undertaken in future in the light of such development measures.

Agricultural development is nothing but the resultant of various factors that influence the productivity per unit of land which is a real index of agricultural development.
Though a number of factors exert a great deal of influence, the present study has chosen only three strategic factors that have been derived from Regression Analysis used for this purpose.

Though these strategic factors i.e., inputs, have been selected for in-depth analysis, it is necessary to assess to what extent these inputs have been adopted by different size-groups of the farmers. Thus, size-wise analysis becomes an important feature of the present study. As an aggregate picture of all the farmers does not serve the purpose, a detailed diagnosis of the adoption of strategic inputs by different size groups of farmers in between advanced and backward villages is very important from the point of devising and implementing the policy measures.

Further, there is an imperative need to ascertain the differences in adopting recommended doses of improved seeds, required water doses for different crops, and water supply (irrigation) in the backward villages and advanced villages. This sort of study points towards how far technological development has penetrated the farm sector.

Lastly, there is a need to arrive at policy suggestions on the basis of the whole study according to the main objectives. Broad conclusions have to be culled out from the study so that certain policies would be derived for framing and their execution.
The following are the main objectives:

(i) To assess the role of agricultural economy in general with a specific reference to the State of Karnataka;

(ii) To study the agricultural development programmes in some Asian countries including India so as to cast comparatively the corresponding programmes in Karnataka;

(iii) To identify the various factors influencing agricultural productivity;

(iv) To ascertain the use of strategic inputs among the farmers of different size groups in both advanced and backward villages;

(v) To know the various problems of different size groups of the farmers of different types of villages concerned in obtaining and adopting the strategic inputs such as irrigation, HYV seeds and chemical fertilizers;

(vi) To examine the difference in following the recommended practices in the advanced and the backward villages and among the different size groups of farmers; and

(vii) To suggest suitable policy measures bearing on certain useful findings arising out of the present study.
METHODOLOGY AND RESEARCH DESIGN

i) Materials and Data Used:

A study of this nature necessitates the use of both primary and secondary data. Accordingly in the present study both the primary and secondary data are used. While the primary data were collected from the farmers the secondary data were collected from the following sources: (i) The Directorate of Population Census, Bangalore, (ii) The Bureau of Economics and Statistics, Government of Karnataka, (iii) The Directorate of Agriculture, Bangalore, and (iv) The State Planning Division.

ii) Selection of the Region:

For the present study the Malaprabha Command Area, which covers Dharwad and Belgaum districts, has been selected. These two districts have been benefitted from the Malaprabha Irrigation Project. Water from this project was released to the farmers for the first time during the agricultural year 1973-74, since then 10 years have passed till 1983-84 (a reporting year). The present work therefore intends to assess the various problems that have arisen during this span of period in the getting and using of three main strategic inputs, namely irrigation, HYV seeds and chemical fertilizers in this command area. It is worth mentioning here that prior to this project, farmers were practicing dry land cultivation with traditional inputs.
Secondly, this study has been carried out in these two districts because the agro-climatic conditions are similar. Soils in both the districts are more or less the same. In both districts laterite and lateritic, red sandy loams and black soils are present. The rainfall in both the districts is more or less the same. For instance, during 1982-83, the average rainfall received in Dharwad and Belgaum districts was 801.3 mms and 783.8 mms respectively.

Thirdly, crops grown by the farmers in both the districts are more or less the same. The important crops of both the districts are jowar, wheat, small millets, gram, tur, maize, and cotton.

Fourthly, these two districts claim relatively special advantage in terms of entrepreneurship and resourcefulness of the farmers. These districts have also great advantage of educational and research facilities. For example, the college of Agriculture* at Dharwad is located in such a strategic place that it can cater to the educational and research needs of agriculturists in both the neighbouring districts.


* Government of Karnataka has now decided to convert the College into a full fledged University from 1985-86.
addition to this, out of the total ten agricultural schools in the entire state, two are situated in these two districts.

Thus looking into the background of education and research facilities these two districts have special advantage over the other northern districts of the State. Further, there is also a Gramsevaka Training Centre at Iharwad and a Farmers' Training Centre at Belgaum, which provide training facilities in respect of various agricultural operations according to modern farm practices.

iii) Selection of Talukas:

For the present study, two talukas alone have been selected from each district. The main criterion for the selection of these two talukas viz., Naragund from Iharwad district and Soundatti from Belgaum district, has been that the percentage of irrigated area in these two talukas has been highest in relation to other talukas of the districts concerned. Besides, these two talukas have been benefitted more from the Malaprabha Irrigation as compared to other talukas. Table -1.1 shows the number of talukas benefitted and area irrigated from the Malaprabha Project.
Table 1.1

Number of Talukas which have benefitted from the Project

<table>
<thead>
<tr>
<th>Talukas benefitted from the project in:</th>
<th>Dharwad District</th>
<th>Belgaum District</th>
</tr>
</thead>
<tbody>
<tr>
<td>Talukas</td>
<td>Irrigated area (in hectares)</td>
<td>Talukas</td>
</tr>
<tr>
<td>Naragund</td>
<td>19,016</td>
<td>Saundatti</td>
</tr>
<tr>
<td>Navalgun</td>
<td>5,323</td>
<td>Ramburg</td>
</tr>
<tr>
<td>Ron</td>
<td>1,825</td>
<td>Bailhongal</td>
</tr>
<tr>
<td>Hubli</td>
<td>989</td>
<td></td>
</tr>
</tbody>
</table>


Table 1.1 clearly reveals that both Naragund (Dharwad district) and Saundatti (Belgaum district) talukas have benefitted more as compared to other talukas in the command area.

iv) Selection of Villages:

Purposive sampling has been used to select the villages. Eight villages have been selected from both the talukas on the basis of the following criteria. The level of irrigation and availability of infrastructure were
considered while selecting the sample villages. Thus in all the selected villages more than 45 per cent of the net cultivated area is under irrigation (Ref. Table - 6.5). In addition to this, the nature of advancement and availability of infrastructural facilities in each of the villages was also considered. Accordingly it was decided to select four advanced villages and four backward villages from each taluka. While selecting the advanced and backward villages, sufficient attention was given to accessibility to transport, communication and extension programmes, etc. Accordingly four advanced villages having facilities like nearness to the taluka headquarters or urban centres, efficient transportation with direct bus services, co-operative society, banking institution, agriculture department sub-centres, post office, library and reading room, health centre, number of tractors and spray pumps etc., were selected. On the other hand, four backward villages having few or none of the above mentioned facilities were selected for comparative purpose. Table 1.2 gives the details regarding the availability of various types of infrastructure facilities in the selected villages.

It is clear from Table 1.2 that in the advanced villages farm families have been getting more facilities than in the backward villages. In this way all the eight villages have been grouped into advanced category (two from each taluka) and backward category (two from each taluka).
### Table 1.2

**Availability of Various Types of Facilities in the Selected Villages/Development Indicators**

<table>
<thead>
<tr>
<th>Nature of Village</th>
<th>Name of the Village</th>
<th>Distance from the road to village (in km)</th>
<th>Nature of the service</th>
<th>Ele-</th>
<th>la-</th>
<th>Co-op-</th>
<th>Primary School</th>
<th>Health Centre</th>
<th>Veterinary Centre</th>
<th>Priv-</th>
<th>Demon-</th>
<th>Total spray</th>
<th>Village level</th>
<th>Tractor (in no.)</th>
<th>Resi-</th>
<th>Land</th>
<th>Five Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Hooli</td>
<td>6y Sholapur Muhil State Highway</td>
<td>Direct Yes Yes Yes Yes</td>
<td>Up to 8th Std.</td>
<td>Yes Yes Yes Yes 2</td>
<td>55</td>
<td>327</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Dherakoppa</td>
<td>23 Katcha &amp; non-set-</td>
<td>3</td>
<td>No No No No No No No No No 1</td>
<td>50</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Kangaral</td>
<td>25 Katcha &amp; non-set-</td>
<td>3</td>
<td>No No No No No Yes 1</td>
<td>6</td>
<td>93</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Siddapur</td>
<td>15 Katcha &amp; non-set-</td>
<td>3</td>
<td>No No No No No Yes</td>
<td>3</td>
<td>51</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Bajarpur</td>
<td>44 Bajarpur Muhil State Highway</td>
<td>Every hour Yes Yes Yes Yes</td>
<td>Up to 7th Std.</td>
<td>No No No No Yes 3</td>
<td>21</td>
<td>210</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>Bairanabatta</td>
<td>7 State Highway</td>
<td>Every hour Yes Yes Yes Yes</td>
<td>Upto 7th Std.</td>
<td>No Yes No No 3</td>
<td>21</td>
<td>210</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*While survey work was going on, electric poles were very installed.*

Source: Village records.
While selecting these villages, the officials of the Department of Agriculture, Department of Irrigation, Block-Development, Taluka Development Boards, Tahsildars, Agricultural Assistants etc., were consulted. They were also consulted while classifying the villages into advanced and backward categories.

Thus, it is on the basis of these criteria we have selected two advanced villages - Kalker and Bairanahatti and two backward villages - Siddapur and Madagunki from Naragund taluka; similarly, two advanced villages - Hooli and Hirekumbi and two backward villages - Dhaderkoppa and Nagadal from Saundatti taluka.

v) Selection of the Sample Farmers:

The next stage was to select farmers from these villages. For the selection of the sample farmers, a list of land holdings in each selected village was prepared with the help of the Talati (village record keeper). The holdings were then arranged in three size classes according to acreage of land. The three size classes are as follows:

(i) Small farmers having upto 2.5 acres of irrigated land or 5 acres of dry land;

(ii) Medium farmers having 2.6 to 7.5 acres of irrigated land or 5.1 to 15 acres of dry land; and

(iii) Big farmers having above 7.6 acres of irrigated land or above 15.1 acres of dry land.
Prom each size class, 10 farmers were selected at random from each of the selected villages. Thus a total of 240 agricultural households were selected from 8 villages for the present study. The selected sample of agricultural households from the selected villages is shown in Table 1.3.

Table 1.3

Sample Size from the Selected Villages

<table>
<thead>
<tr>
<th>Nature</th>
<th>Villages</th>
<th>Small Farmers</th>
<th>Medium Farmers</th>
<th>Big Farmers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADVANCED</td>
<td>Hooli</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Hirektumbi</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Kalkeri</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Bairannahatti</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>BACKWARD</td>
<td>Dhaderkoppa</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Kagadal</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Siddapur</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Madagunki</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>80</td>
<td>80</td>
<td>80</td>
<td>240</td>
</tr>
</tbody>
</table>

The primary data were collected from the 240 sample farmers of the eight selected villages using the interview method by the researcher. For the purpose of collecting data from the sample households, an exhaustive interview schedule
had been prepared and canvassed during April-June 1984. These villages were visited during other months also for cross checking the data and for further clarification whenever necessary. Information regarding the sample farms was gathered for the agricultural year 1983-84.

A pilot study was conducted before commencing the main field work. The interview was invariably held with the heads of the agricultural households.

The interview schedule comprised pre-coded answers and also a number of open-ended questions. Farmers in the sample were contacted several times and discussions were held with them individually on various aspects while canvassing the schedule. Detailed notes were taken during these discussions and attempts were made to compare and cross-check the views and ideas expressed by these farmers during the 90 days of the survey work.

It may not be out of place to record here some of the problems faced in the course of data collection for this work. By and large, it was not difficult to collect information from the selected respondents. When the farmers were approached with the interview schedule with an explanation about the nature of the research, most of them willingly agreed to spend some of their time to answer the questions of the interview schedule and participate in the discussion. However, some difficulty was experienced in collecting information from a few big farmers. The reason for their reluctance
was the lurking fear about the investigator as to whether he was a government officer or a personnel from the irrigation department from whom such big farmers usually reserve their frank opinions. The fact that some of the backward villages in the sample are ill-served by good roads created some difficulties in reaching them.

The data were later processed and tabulated. The analysis of primary data on various aspects is presented in Fifth, Sixth, Seventh and Eighth Chapters of the study and forms the original contribution of the researcher. The statistical techniques used in this study include mainly the averages, percentages and regression analysis whenever necessary. In addition, the study has been supplemented by a wide coverage of readings, references and cross references as mentioned in the bibliography appended with this thesis.

Limitations of the Present Work:

Like other studies on agricultural economics, the present work also suffers from two general limitations in the case of the primary data. Firstly, the information relates only to the agricultural year 1983-84, during which the survey was conducted. Secondly, the data were obtained by the survey method where the farmers provided information from their memory. Unfortunately, a large majority of the farmers had not maintained the details of accounts regarding agricultural operations. Therefore, the accuracy of data collected through the schedules is not cent per cent.
The study on hand is also based on the data supplied by Government bodies like State Bureau of Economics and Statistics, State Department of Agriculture etc. Unfortunately, despite several attempts researcher could not get the latest data supposed to be available with the officials. Nevertheless, maximum efforts were made to make good this lacuna by collecting information from other sources.

In the present work, attention has been focussed mainly on the various problems faced by the farmers engaged in the modernization of agriculture using the HYV seeds, irrigational facilities and chemical fertilizers. Other agricultural problems being beyond the purview of the present work, this study does not consider them.

Similarly, the study is confined to two crops only viz., cotton and maize leaving out other crops like jawar, wheat, sunflower etc., which are also important crops of the area. In view of the specific nature of the study it was felt that it was neither possible nor necessary to cover all the farm practices involved in growing these crops. Hence, the study focusses mainly on the major farm practices like tillage practices, recommended spacing between rows and plants, number of plant protection sprays, recommended quantity of seeds, recommended doses of water and chemical fertilizers.
Thus, the present study throws light on broad trends of the various problems in using and adopting high yielding variety seeds, chemical fertilizers, and irrigational facilities both at the village and at the farm levels. Other current problems such as land reform, well irrigation, land consolidation, marketing, storage and warehousing etc., though important, had to be left out of our purview in the interest of in-depth analysis of the selected problems of agriculture.

Importance and Contribution of Work:

The Green Revolution in Punjab and Haryana has proved beyond doubt that a scientific use of modern strategic inputs could bring about significant improvements in agriculture hitherto undreamt of. However, experience has shown that the spread of modernization of agriculture is not uniform throughout India. While, certain regions have promptly responded to the new knowledge and techniques of agriculture, others have lagged behind. Therefore a careful study of the conditions of agriculture in different regions and different parts of India should not only be welcome but also necessary.

The present study is taken up with a view to throwing light on the various problems faced by the farmers in adopting these revolutionary agricultural practices in the northern region of Karnataka. In the course of this research work sincere efforts have been made to probe deep into the
numerous problems faced by the agriculturists in switching over from traditional farm practices to modern scientific ones. It is firmly believed that such studies in all the regions of our country will not only help to tackle these problems effectively but will also hasten the process of modernization of agriculture. Researcher feels that his humble efforts would be richly rewarded if his findings throw light on the intricacies of the problems at the farm level thereby proving helpful to the policy makers and extension workers engaged in the onerous task of modernization of Indian agriculture.

The present study has been divided into nine Chapters.

Chapter - I: Introduction:

Introduction (i.e., the present chapter) chapter deals with a review of literature and statement of the problem, research methodology, objectives of the study, limitations and importance of the present study.

Chapter - II: Role of Agriculture in Economic Development in General and in the State Economy of Karnataka:

Initially the Chapter throws light on the role of agriculture in economic development under three broad heads as classified by Simon Kuznets from a theoretical point of view. The second section deals with the role of agriculture in Karnataka economy. And also presents briefly the general geographical, demographic features of Karnataka.
Chapter -III: Agricultural Development Programmes in Asian Countries in General and India in Particular:

The agricultural development programmes in important Asian countries of Japan and Taiwan are analysed in the earlier parts of the chapter. Further, an attempt is also made to examine the agricultural development programmes implemented in India during the various Plans. Finally, it also provides briefly a comparative picture of the progress of agricultural development programmes in the selected Asian Countries and India.

Chapter -IV: Agricultural Development Programme in Karnataka:

This chapter presents briefly the agricultural development programmes implemented by early rulers of the State. It then throws light on such programmes during the different Five Year Plans of the State of Karnataka.

Chapter - V: Factors Influencing Agricultural Productivity:

This chapter deals with the meaning and characteristic features of traditional and modern inputs. It then studies the earlier findings regarding the factors influencing agricultural productivity both at the micro and macro levels. It also studies factors influencing agricultural productivity on the basis of the data collected from the sample farmers. Finally it discusses the main findings and results of the Regression Analysis.
Chapter VII: Problems and Issues of Irrigation

In this chapter, the development of irrigation facilities in the Karnataka economy and various problems of the same at the State level are analysed. Discussions of irrigation practices, inputs utilization and various farm level problems are also included in the Chapter.

Chapter VIII: Chemical Fertilizers: Practices and Problems

This chapter presents briefly the progress and level of fertilizers consumption at the State level. Further, it examines the fertilizers practices, use for various crops, and farm level problems like wrong use, adulteration, scarcity, non-availability of capital and extension services etc.
Chapter - IX: Summary And Conclusion:

The last chapter contains the summary of the main findings. In this chapter an effort is also made to offer certain policy suggestions for tackling the numerous farm level problems.