THE APPLICATION OF SAMPLING TECHNIQUE IN THE STUDY OF ATTITUDES OF FARMERS AND THEIR SONS ON EDUCATION AND FARMING IN ALIGARH DISTRICT U.P.

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CHAPTER - I

INTRODUCTION

India is primarily an agricultural country. A vast majority of the people in India depend on agriculture for their livelihood directly or indirectly. Tremendous progress has been made in the field of agriculture in the country in the recent years. This includes development of new methods of farming, ways and means to tackle the problems of flood, drought, pests and disease and salinity of the soil, in addition to evolving hybrid and high yielding varieties of various crops.

Traditionally agriculture in India has been in the hands of millions of farmers the majority of them being illiterate. They hardly realise the importance of education and generation after generation avocation of agriculture is inherited by the Indian farmers from their forefathers. On account of the widespread illiteracy, slow spread of education and very little opportunities for alternative employment, the children of the farmers continue to till and cultivate the lands which belong to the family.

In the last few years, particularly in the years after independence, India has also made sufficient progress in the field of education, whereas in 1951, the literacy in India was only 21.3% in 1971 it became 31.8%. When literacy is increasing among all sections of the society it is desirable to watch how the out look of the farming community towards agriculture is changing with the spread of literacy among them. Again with

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the increase in population and reduction of percapita availability of land, it is also likely that the farming community might have changed their out look towards agriculture. Thus, in the context of modernisation in agriculture, spread of education and scarcity of land, "A study of the relationships between the attitudes of the farmers and their sons as also how it varies among small and big farmers will be of considerable interest." Such a study may throw considerable light on the acceptibility of agriculture as a profession and which will ultimately determine the future prospects for agriculture in the country. The present study is an attempt in this direction.

The sample surveys are a means to study the characteristics of a given population by studying only a small faction of it. Through sample surveys we can collect information at a reduced cost with an increased speed and at the same time with greater accuracy and wider scope.

Modern sampling theory based on probability sampling also helps us in judging the reliability of the sample estimates from the sample itself. In the past, sampling techniques have been successfully employed for the estimation of production of crops, output of livestock products, production of horticultural crops, catch of marine fish, for collecting the statistics of the fertilizer use and so on. The use of modern sampling technique has not so far been made in studying the human behavior and attitude of people. It is proposed to make some studies on these aspects.

Similar type of study has been carried out by Coleman (1959) using snowball sampling technique, which is defined as: Interviewing first a small sample of persons, then asking these persons who their best friends are, interviewing those friends, then asking them their friends, interviewing these and soon. In this way, the sampling plan follows out the chain of sociometric relations in community. In many respects, this samplér the tracks down "leads" from person to person. But in this different approach, an individual interviewing is seen as a part of some larger structure in which the respondent finds himself eg. his net work of friends, the shop or office where he works. In such cases, sociometric questions can be asked eg. which supervisor do you turn to most often ? or when you want X type of job done in a hurry to whom do you go to get it done? or when you need advice to whom do you usually turn to? In this kind of research, it is no longer possible to pull each individual out of his social context and interview him as an independent entity.

The role of management as an input in agriculture is being increasingly recognized. Human behavior, attitude of farmers, and their families particularly, the sons of the farmers, who are the farmers of tomorrow, are important component of the managerial input. A farmer and his sons can be looked upon as a single managerial unit in the population of farms in a given Tahsil or district. By selecting a random sample of farm households and collecting information on the attitude of farmers

towards farming, towards education and their continued involvement in the farming profession and then by collecting similar type of information from their sons independently can provide answers to some of the questions intimately connected with management of the farms, present and prospective. Further the classification of the farmers in the sample according to their standard of education, their social status, their resources etc. can provide indicators of the future set up of agriculture, dependance of rural population on agriculture and employment of sons of farmers in other professions.

The identity of attitudes towards education and agriculture of farmers and their sons has been discussed in Chapter-II. The number of identical views for and against education and agriculture, and similar results according to the factors such as; Distances of villages from city, Area under irrigation, Educational facilities, Education of the farmers, Availability of agricultural inputs and Availability of labour in the villages, are also discussed in Chapter-II.

The association between the favourable and unfavourable attitudes of fathers and sons had been studied and discussed in Chapter-III.

Summary of the results discussed in the thesis and conclusions of the study are presented in Chapter-IV.

CHAPTER - II

STUDY OF THE ATTITUDE OF FARMERS AND THEIR SONS TOWARDS EDUCATION AND FARMING

It is proposed to undertake statistical study of the data on the attitude of the farmers and their sons towards education and agriculture and also the mutual relationships between their attitudes or in otherwords the identity or otherwise in the opinion of farmers and their sons in the two diverse fields of education and agriculture. These two fields though look diverse yet are interdependent to a considerable extent. There can be no doubt that the educated farmers can manage the farms better than those not educated. On the other hand education can not progress unless it reaches the massee majority of whom are farmers.

2.1 Population considered for the study:

It will be particularly useful to carry out such investigations in areas which are important from the agriculture point of view and where the farmers are of progressive type. The intensive agricultural district programme (I.A.D.P.) has been in operation in a number of districts in the country for over a decade. One of the districts covered by the programme is Aligarh district in U.P. This district was selected for the investigation This district comprises seventeen community development blocks which includes 1762 villages and 5 towns. The district has a geographical area of 5030.4 square kilometers, out of which

79% was cultivated. About 57% of the cultivated area was irrigated the major sources of irrigation were canal, tube-wells masonary wells, persian wheels etc. The major cereal crops of the district were Bajra, Wheat, Barley, Maize & Gram. The other important crops grown in the district were sugarcane, cotton & fodder crops etc. Population of the district according to the 1961 population census was 200,896. thousands, majority of which depend on agriculture. 19.8% of the population in the district was literate. Average size of the holding was less than 1.5 hectares. For the proposed study the population consists of the "farmers" in the rural areas of the district.

2.2 Sampling Plan:

The sampling plan adopted for the study was one of multistage random sampling in which the community development blocks were the psu's, villages within blocks were the ssu's and farmers within villages were the ultimate units of sampling. Blocks and villages were selected with equal probability and without replacement. The farmers within the villages were selected using the procedure of binomial sampling. This consisted in visiting the households in the village in the order of their allocation and consulting three digit random number tables (ignoring the number 000). A column was chosen at random and the numbers in the column were referred to one by one corresponding to each household visited. A household was included in or excluded from the sample according as the random

number happened to begin with a zero or not. This procedure was followed for all the households in the selected villages. Obviously this resulted in a approximately a 10% random sample of all the households in the selected villages. The procedure followed also helped in saving of time which would have been spent on the preparation of the sampling frame of the farmers in the village which would have been required for selecting a random sample with equal probability. Further, in order to complete the work in a short time a second visit in the selected household was avoided and the required data were collected from the household of the selected farmers side by side.

2.2.1 Size of the sample:

Two community development blocks namely Lodha and Dhanipur were selected. From Lodha block, which consists of 139 villages, twelve villages and from Dhanipur which consists of 100 villages, six villages were selected. From each selected village nearly 10% farmers were selected by the aforesaid procedure.

The main questionnaire in the schedule was directed to ascertain the views of farmers and their sons towards education and farming. In the case of some of the farmers it was found difficult to extract *any* definite reply to some of the questions in the schedule particularly on agriculture.

2.3 Period of enquiry:

The data were collected for the period of four weeks. The data were collected by me personally. I took the help of District Project Officer, District Agriculture Officer and two local officials.

2.4 Collection of data:

Each of the farmers and their available sons were contacted and carefully constructed schedule for the relational study was canvassed for them. The schedule 1,2,3 used for the enquiry have been presented in appendix I. Some of the relevant information regarding the villages was alsocollected in schedule-4 presented in the appendix I.

The data collected through the investigation were studied by the technique of relational analysis. To investigate the attitude of farmers and their sons towards education and farming both fathers' and sons' attitude have been studied individually and also jointly. The attitudes of the farmers and their sons were divided into two classes namely 'GOOD' or favourable and 'Poor' or unfavourable. For the purpose of the computation of the relational tables, the opinion of each father was taken into consideration as many times as the number of sons contacted for the purpose.

2.5 On estimation of number of identical views in population with respect to any particular character:

An o stage k name snaball sampling procedure is defined by Goodman (1961) as follows. A random sample of individuals is drawn from a given finite population. Each individual in the sample is asked to name k different individuals in the population with whom he most frequently associates. The individuals who are not in the random sample but are named by individuals in it form the Ist stage. Each of the individual in the Ist astage is

then asked to name k different individuals. The individuals who are neither in the random sample nor in the 1st stage but were named by the individuals in it form the 2nd stage. Each of the individual in the 2nd stage is asked to name k different individuals. The procedure is continued until each of the individuals in the s^{th} stage has been asked to name k different individuals.

For c=k=1, B_{11} is the number of mutual relationships in the population. In Goodman's definition of snowball sampling technique if we make a slight modification by taking an initial sample of fathers as the $zero^{th}$ stage and the first available son (of 16 years or more) of the selected fathers as the individuals of 1st stage in the terminology of snowball sampling technique and study their views regarding any character say education or farming and if both (father and son) have identical views, then we say that father and son are mutually related to each other with respect to that particular character. In other words we can say that the number of identical views in the population with respect to any character is equivalent to the number of mutual relationships between fathers and their sons with respect to the same particular character.

Notations used:

Let

N be the number of blocks in the district.

n be the number of blocks selected from the district.

M_i be the total number of villages in the i^{th} block.

m_i be the number of villages selected.

$(X_{11})_{..}$ be the number of identical views in the population of farmers.

$(X_{11})_{ij}$ be the number of identical views in the j^{th} village of the i^{th} block with reference to the given character.

V_{ij} be the number of individuals of the sample in the j^{th} village of the i^{th} block who have identical views with respect to the character.

So, $(X_{11})_{..} = \sum_{i=1}^{N} \sum_{j=1}^{M_i} (X_{11})_{ij}$ 2.5.1

$(\bar{X}_{11})_{..}$ be the average number of identical views per village in the population.

$$\therefore (\bar{X}_{11})_{..} = \frac{1}{N} \sum_{i=1}^{N} \sum_{j=1}^{M_i} \frac{U_i}{M_i} (X_{11})_{ij}$$

where $U_i = \frac{\Pi_i}{\Pi}$ and $\Pi = \frac{1}{N} \Pi_i$

consider the following estimate of $(\bar{X}_{11})_{..}$

$$\therefore (\hat{\bar{X}}_{11})_{..} = \frac{1}{n} \sum_{i=1}^{n} \frac{U_i}{m_i} \sum_{j=1}^{m_i} \frac{v_{ij}/i}{p} \quad \text{..... 2.5.2}$$

where p is the probability that an individual is selected in the sample.

$$E(\hat{\bar{X}})_{..} = E_1 \left[\frac{1}{n} \sum_{i=1}^{n} U_i \left\{ E_2 \frac{1}{\Pi_i} \sum_{j=1}^{m_i} E_3 \frac{(y_{ij}|i)}{p} \right\} \right]$$

$$= E_1 \left[\frac{1}{n} \sum_{i=1}^{n} U_i \left\{ E_2 \frac{1}{\Pi_i} \sum_{j=1}^{m_i} (X_{11})_{ij}/i \right\} \right]$$

$$= E_1 \left[\frac{1}{n} \sum_{i=1}^{n} U_i (\bar{X}_{11})_{i(\Pi_i)} \right]$$

$$= \frac{1}{N} \sum_{i=1}^{N} U_i (\bar{X}_{11})_{i.}$$

$$= (\bar{X}_{11})_{..}$$

Hence it is an ubiased estimate.

$$\text{Var}\ (\bar{\bar{x}}_{11})_{..} = V_1E_2E_3\left[(\hat{\bar{x}}_{11})_{..}/1\right] + E_1V_2E_3\left[(\hat{\bar{x}}_{11})_{..}/1\right] + E_1E_2V_3\left[(\bar{x}_{11})_{..}/1\right] \quad \ldots\ldots\ldots \quad 2.5.3$$

$$V_1E_2E_3\left[(\hat{\bar{x}}_{11})_{..}/1\right] = V_1E_2\left[\frac{1}{n}\sum_{i=1}^{n} u_i \frac{1}{m_i}\sum_{j=1}^{m_i} E_3\ \frac{(y_{ij}/i)}{p}\right]$$

$$= V_1E_2\left[\frac{1}{n}\sum_{i=1}^{n} u_i \frac{1}{m_i}\sum_{j=1}^{m_i} (x_{11})_{ij}/1\right]$$

$$= V_1E_2\left[\frac{1}{n}\sum_{i=1}^{n} u_i\ (\bar{x}_{11})_{i}(m_i)\right]$$

$$= V_1\left[\frac{1}{n}\sum_{i=1}^{n} u_i\ (\bar{x}_{11})_{i.}\right]$$

$$= \left(\frac{1}{n} - \frac{1}{N}\right) s_0^2 \quad \ldots\ldots\ldots\ldots \quad 2.5.4$$

where $s_0^2 = \frac{1}{N-1}\sum_{i=1}^{N}\left[\frac{m_i}{m}(\bar{x}_{11})_{i.} - (\bar{x}_{11})_{..}\right]^2$

$$E_1V_2E_3 = E_1\left[\frac{1}{n^2}\sum_{i=1}^{n} V_2\left\{u_i \frac{1}{m_i}\sum_{j=1}^{m_i}(x_{11})_{ij}/1\right\}\right]$$

$$= E_1\left[\frac{1}{n^2}\sum_{i=1}^{n} u_i^2\ \left(\frac{1}{m_i} - \frac{1}{M_i}\right) s_i^2\right]$$

where, $s_i^2 = \frac{1}{M_i - 1}\sum_{j=1}^{m_i}\left[(x_{11})_{ij} - (\bar{x}_{11})_{i.}\right]$

$$= \frac{1}{nN}\sum_{i=1}^{N} u_i^2\left(\frac{1}{m_i} - \frac{1}{M_i}\right) s_i^2 \quad \ldots\ldots\ldots \quad 2.5.5.$$

$$E_1E_2V_3\left[(\hat{\bar{x}}_{11})_{..}/1\right] = E_1E_2\left[\frac{1}{n^2}\sum_{i=1}^{n} u_i^2 \frac{1}{m_i^2}\sum_{j=1}^{m_i} \text{Var}\ \frac{(y_{ij}/i)}{p}\right]$$

$$= E_1E_2\left[\frac{1}{n^2p}\sum_{i=1}^{n} u_i^2 \frac{1}{m_i^2}\sum_{j=1}^{m_i}\left\{(x_{11})_{ij}/1\right\} p\right]$$

$$= \varepsilon_1 \frac{q}{n^2 b} \left[\sum_{i=1}^{N} U_i^2 \frac{1}{m_i} \frac{1}{m_i} \sum_{j=1}^{M_i} (I_{11})_{ij} \right]$$

$$= \frac{q}{nMb} \sum_{i=1}^{N} U_i^2 \frac{1}{m_i M_i} \sum_{j=1}^{M_i} (I_{11})_{ij} \quad \ldots\ldots\ldots 2.3.6$$

Substituting 2.3.4, 2.3.5, and 3.2.6 in (2.3.3) we get,

$$\text{Var}\left[\overline{(I_{11})}_{..}\right] = \left(\frac{1}{n} - \frac{1}{N}\right) \sigma_b^2 + \frac{1}{n} \frac{1}{N} \sum_{i=1}^{N} U_i^2 \left(\frac{1}{m_i} - \frac{1}{M_i}\right) \sigma_i^2$$

$$+ \frac{q}{nMb} \sum_{i=1}^{N} U_i^2 \frac{1}{m_i M_i} \sum_{j=1}^{M_i} (I_{11})_{ij}$$

$$\hat{V}\left[\overline{(I_{11})}_{..}\right] = \text{Est. of } \left(\frac{1}{n} - \frac{1}{N}\right) \sigma_b^2 + \text{Est of } \frac{1}{n} \frac{1}{N} \sum_{i=1}^{N} U_i^2 \left(\frac{1}{m_i} - \frac{1}{M_i}\right) \sigma_i^2$$

$$+ \text{Est of } \frac{q}{nMb} \sum_{i=1}^{N} U_i^2 \frac{1}{m_i M_i} \sum_{j=1}^{M_i} (I_{11})_{ij} \quad \ldots\ldots 2.3.7$$

$$= \left(\frac{1}{n} - \frac{1}{N}\right) \sigma_b^2 + \frac{1}{nN} \sum_{i=1}^{N} U_i^2 \left(\frac{1}{m_i} - \frac{1}{M_i}\right) \sigma_i^2$$

$$+ \frac{1-q}{n^2} \frac{1}{n} \sum_{i=1}^{n} U_i^2 \frac{1}{m_i^2} \sum_{j=1}^{m_i} y_{ij}/1$$

where, $\sigma_i^2 = \frac{1}{m_i - 1} \sum_{j=1}^{m_i} (y_{ij} - y_{i.})^2$

and $\sigma_b^2 = \frac{1}{n-1} \sum_{i=1}^{n} \sum_{j=1}^{m_i} (y_{ij} - y_{i..})^2$

On the basis of the aforesaid estimate, the average number of identical views, favourable and unfavourable views have been estimated and presented in tables 1 and 2 in appendix XI along with standard errors, both for education and agriculture.

The average number of identical views obtained for education was 102.27 per village and the average number of non identical views was 62.32. This indicates that most of the farmers and their sons were of identical views towards education. The number of identical views was also more then the number of non identical views in case of agriculture but it was less as compared to that for education. The average number of identical and non identical views in this case was 92.63 and 52.06 respectively.

In case of education when favourable and unfavourable identical views were studied, it was found that favourable identical views overwhelmingly out numbered the unfavourable identical views. (83.82 against 18.43). From this data one can very well conclude that a large majority of the farmers and their sons showed attitude favouring education.

However it was found that a majority of the farmers and their sons were somewhat less inclined towards agriculture. The average number of favourable identical views were 43.33 and the average number of unfavourable identical views were 49.32. The study thus indicates that there is a tendency among the farmers of running away from the agriculture with the spread of education. Such a tendency is bound to affect adversely the future of agriculture. However, since the results are based on a rather small sample of farmers, the study may not be considered conclusive and will need more detailed investigations.

The above findings indicate that a fairly large proportion of farmers and their sons favoured education to agriculture. This was probably due to the fact that most of these farmers had small land holdings. (the average size being 3.2 acres approximately). This could possibly be one of the reasons for their disinterest in agriculture. Such a tendency is likely to grow from generation to generation as a result of increasing pressure of population on land. In the course of time the holdings get further subdivided among the children of the farmers and thus shrink in size.

There are certain factors which are likely to affect the attitude of farmers and their families towards education although apparently they may not seem to do so. There are for example, the availability of educational facilities in the villages, status of agriculture in the village namely agriculture is done under irrigated conditions or not, whether the agriculture has been recognised to a good degree, agricultural inputs like fertilizers etc., necessary for improved

farming are easily available in the villages or not and above all on their environments namely that is the educational status of the other farmers in the village. It may not be sufficient to study the identity of views on education or otherwise of the farmers and their zone completely in isolation with these factors. Therefore identical views for or against education were also estimated separately according to the following classifications of villages.

1. (i) Distance of the village from the city ≤ 10 km.
   (ii) Distance of the village from the city > 10 km.
2. (i) Entire area under cultivation is irrigated.
   (ii) Part of the area under cultivation is irrigated.
3. (i) Schools exist within the village.
   (ii) Schools do not exist within the village.
4. (i) ≥ 30 % farmers are educated in the village
   (ii) < 30 % farmers are educated in the village.
5. (i) ≥ 50 % agricultural inputs available within the village.
6. (ii) < 50 % agricultural inputs are available within the village.
6. (i) ≥ 50 % labour available within the village
   (ii) < 50 % labour available within the village.

Firstly, their opinions regarding education have been discussed and presented in table 3 appendix II followed by that regarding agriculture, presented in table 4 appendix II.

Since the total number of villages in the [illegible] according to the aforesaid classifications

factors were not available, the standard errors of the estimates could not be computed.

2. Education

Distance of the village from the nearest city

In case of villages which were less than ten Kms from the city, it was observed that the average number of favourable identical views expressed were 07.7 per village. However, in villages situated at a distance greater than 10 Kms it was observed that the average number of favourable opinions obtained was 05.6.

When the unfavourable opinions were studied, it was observed that in the villages less than 10 Kms from the city, the average number of unfavourable opinions was 9.0. In villages more than 10 Kms away from the city the corresponding average number was found to be 10.0. On the whole it may be concluded that unfavourable views do not depend so much on distance of the village from the nearest city.

Greater number of favourable opinions 07.7 and lesser number of unfavourable attitudes (9.0) have been obtained in case of villages less than 10 Kms from the city as far as education is concerned. The distance factor, influenced the farmers opinion on education to some extent.

Area under irrigation

When the observations for villages which were reported to have all the area under irrigation, were

examined, it was found that average number of favourable opinions was 53.3.

In villages, partly irrigated, it was found that the average number of favourable opinions was 86.7. It was found that in villages where area was partially under irrigation, the farmers favoured education, possibly because cultivation was not well remunerative in these villages on account of lack of irrigation facilities. The study of unfavourable attitudes here indicated a large number of farmers and their sons did not favour education, in entirely irrigated tracts. Average number of unfavourable attitude was 23.7 in entirely irrigated areas against 11.7 in villages with partly irrigated area.

This indicates the homogeneity and uniformity of their thinking and the mutual understanding between them.

Educational facilities

The study indicated that a relatively larger number of persons was resident of villages without schools. The average number of favourable opinions for entire area in the villages having schools was 67.3, while in villages without schools the corresponding number was 83.1. This attitude was found to be reflected more in villages without schools, perhaps because of the farmers of these villages had been deprived of education and hence they were education hungry and were more inclined towards education.

When the unfavourable attitudes were studied, again it was found that the number of unfavourable but identical views among farmers and their sons residing in villages not

having schools was 33.6 while it was 31.3 in case of villages with schools. This type of opinions can be explained because of human nature to become more and more reluctant in sending the children to educational institutions as the distance between their houses and educational institutions increased.

Education of the farmers

The average number of favourable attitudes was found to be almost unaffected by the number of educated farmers in the village. The average number worked out to 75.0 and 80.0 in the villages with more than 30% educated farmers and in the villages with less than 30% farmers educated respectively. This small difference could be attributed to the tendency of the uneducated farmers, having an attraction for education.

When unfavourable attitude was studied, it was found to be greater in the villages where more than 30% educated farmers resided. (The numbers were 20.0 and 15.3 for the two types of villages respectively.) These farmers saw the futility of education as in these villages no schools existed, majority of the area was under irrigation and in most of the villages agricultural inputs were available within the villages.

Availability of agricultural inputs

It was observed in case of favourable opinions for education the average number of farmers who favoured education was greater in the villages where agricultural inputs were not available. This tendency can be easily explained, firstly by saying that when agricultural inputs have to be imported farming becomes inconvenient and less remunerative profession and,

secondly because in most of these villages no schools existed within the village.

It was found that greater number of farmers opined against education in the villages where agricultural inputs were available within the village. The numbers were 22.8 and 11.6 for the villages where agricultural inputs were available easily and for those where these were not so respectively.

Availability of labour

It was seen that in villages where the agricultural labour was mostly available from within the villages the number of identical views in favour of education was more than the corresponding number in the villages in which labour availability within the village was less. This could be on account of the fact that because hired labour was easily available the farmers had a preference for sending their sons to schools. On the contrary where there was difficulties in getting labour on hire they had to bank upon the family labour for the agricultural work and therefore did not like their sons to go to educational institutions.

II. AGRICULTURE

As indicated earlier a study based on similar post stratification of villages has also been made to investigate the attitude of the farmers and their sons towards farming. The result of this study are discussed below

Distance of the village from the city

The average number of identical favourable opinions towards farming was found to be greater in case of villages

less than ten kms. from the city. The average number was 30.0 in case of villages less than ten kms from the city and 32.8 in case of villages more than ten Kms from the city. Perhaps that is because of the fact that when the villages are near to the city, the agricultural inputs are easily available, the market is close by, hence the less cost of transportation.

Similarly, a large number of farmers and their sons indicated unfavourable opinions for agriculture in case of farmers and their sons residing in villages more than ten Kms. from the city.

Area under irrigation

It was found that the number of farmers and their sons favouring agriculture was larger in entirely irrigated areas in comparison to those with part of the area irrigated. The average being 33.7 for entirely irrigated areas and 26.7 in the case of part of the area irrigated. This is natural as water plays the most important role in the growth of crops and hence its availability effects the final yield to a large extent.

Similarly, it was found that the number of unfavourable opinions was greater in case of villages which fall in the category of partially irrigated areas. The average number was 34.2 and 33.1 in case of partially and entirely irrigated villages, respectively.

Educational facility

As expected the number of favourable identical opinions for agriculture was found to be greater (47.1) in villages where no schools existed as compared to that (31.9) in villages in which schools existed. The cause is not difficult to find. It

is a human tendency to avail of that is easily available, hence, the farmers and their sons show greater inclination to farming in villages where schools do not exist.

When the unfavourable identical views were examined, unmistakably the same bent of mind could be observed. A slightly larger number of farmers and their sons were against farming in villages where schools existed. The average numbers being 47.0 and 44.4 respectively.

Education of the farmers

Villages in which less than 30 per cent of educated farmers resided, were found to have greater number of farmers and their sons inclined favourably towards agriculture. The number was 46.7 in case of villages with less than 30 per cent educated farmers and 32.0 in case of villages having more than 30 per cent educated farmers.

When unfavourable identical opinions were studied for agriculture, it was found that again the thoughts ran on similar lines. Larger number of farmers and their sons who did not favour agriculture were found to belong to the villages where more than 30 per cent of educated farmers resided. The average number of identical unfavourable opinion being 63.3 and 39.7 in case of villages having more than and less than 30 per cent educated farmers, respectively.

Availability of agricultural inputs

It appears from the results that availability or otherwise of agricultural inputs did not influence much the views of farmers and their sons as far as preference for farming goes.

When the favourable opinions were studied, it was found that more farmers favoured agriculture in villages which had a

greater availability of agricultural inputs.

In case unfavourable identical opinions for agriculture, it was found that a larger number of farmers and their sons who did not favour agriculture belonged to the villages where agricultural inputs were not available.

Availability of labour

The results of the study show that the availability of labour within the village or otherwise did not have any noticeable influence upon the attitude of farmers and their sons as far as farming is concerned.

2.7 On the measurement of tendency in the identity of views of farmers and their sons with respect to any character

So far, the inferences which have been drawn from relational tables are simply based on the cell frequencies or in other words the number of times 'Good or 'Poor' opinion of the farmers and their sons towards education and agriculture are observed. Such opinions might have been influenced by chance causes i.e. the farmers and their sons might have expressed their views somewhat randomly or with certain tendency or conservation. In order to see, with what tendency, the farmers and their sons expressed their views, we shall analyse the data by adopting a chance model introduced by Nicholls, William'. This type of study can be made by considering the following type of relational table.

		Fathers		
		Good	Poor	Total
Sons	Good	a_{11}	a_{12}	$a_{1.}$
	Poor	a_{21}	a_{22}	$a_{2.}$
	Total	$a_{.1}$	$a_{.2}$	$a_{..}$

The above table gives four-fold classification of the attitudes towards a certain character for the fathers and sons and further the according as the attitudes were good or poor. It looks like an ordinary contingency table. If we interpret it in a slightly different fashion the following questions may arise.

(i) Do fathers with 'Good' attitude towards education or agriculture tend to choose 'Good' attitude more than would be expected.

(ii) Do sons with 'Good' attitude towards education or farming tend to choose 'Good' attitude more than would be expected.

(iii) Do fathers with 'Poor' attitude towards education or agriculture tend to choose 'Poor' attitude more than would be expected.

(iv) Do sons with poor attitude towards education or agriculture tend to choose poor attitude more than would be expected.

These questions depend upon what we take as chance or tendency. A measure of such tendency can be worked out by chance model.

Chance model

Suppose an urn containg the slips of 'Good' attitude and of 'poor' attitude with respect to a certain character. When a person makes a choice, then, he will look in the urn with probability 'h' and draw out a slip of his own attitude. He will simply draw a slip at random with probability (1-h). Then

probability 'h' is a measure of the tendency to choose some one from his own group. If h is zero, he always chooses at random.

The aforesaid statement can be expressed mathematically as follows:

$$a_{11} = a_{1.}\left[\, h \times 1.0 + (1-h)\, p \,\right] \quad \cdots \quad (2.7.1)$$

i.e. the proportion 'h' of choices go to class of his own attitude with probability 1, while (1-h) go to his own class with probability 'p'. The equation (2.7.1) can be rewritten as

$$a_{11} = a_{1.}h + a_{1.}p - a_{1.}hp$$

$$= h\,(a_{1.} - a_{1.}p) + a_{11} - a_{1.}p$$

$$\text{or} \quad h = \frac{a_{11} - a_{11}}{a_{1.} - a_{11}} \qquad 0 \leq h \leq 1 \quad \cdots\cdots \quad (2.7.2)$$

$$= \frac{\text{Actual} - \text{Expected}}{\text{Maximum} - \text{Expected}}$$

We can modify it slightly, if the person, instead of choosing the slip of his own class, chooses the slip of the other class. Then in equation (2.7.1), 1.0 will be replaced by zero, and

$$h' = \frac{a_{11} - a_{11}}{a_{11}} \quad \cdots\cdots\cdots\cdots \quad (2.7.3)$$

i.e. the shunning tendency be $h' = -h$, then we have the measure of tendency which varies from -1 to +1.

Calculation for the expected frequencies

For actual data, expected frequencies can be built up as follows:

If there is no tendency to choose from his own class, then the probability of choosing his own class will be equal

to the number of identical views in the class divided by the total number of views.

Let $a_{i.}$ be the total number of persons in sub-class one. Therefore the number of choices made by the persons in this sub-class is also $a_{i.}$. Let $a_{..}$ be the total number of persons in all sub-classes, a_{ii} be the expected number of choices from the persons in first sub-class to those in the first sub-class.

$$a = \frac{a_{i.}(a_{i.}-1)}{(a_{..}-1)} \quad \ldots\ldots\ldots (2.7.4)$$

The values of h have been worked out for the attitudes observed in the enquiry and these are given below in table 8.

Table 8

Tendency of Attitudes							
Education				Agriculture			
Fathers		Sons		Fathers		Sons	
Good	Poor	Good	Poor	Good	Poor	Good	Poor
- .041	.235	.432	.091	.153	.612	.830	.064

It may be observed that the values of 'h' in the cases where the father had a 'Good' attitude and son a 'Poor' attitude with respect to both the characters studied i.e. education and agriculture were very near to zero and thus it may be concluded that these attitudes were not expressed with any definite tendency. On the other hand in cases where the attitude of

of fathers was 'Poor' or that of the son was 'Good', the attitude had been expressed with a certain tendency, the measure of which varies between .29 to .61, which shows that these opinions, were to some extent, influenced by environment. Similar measure of tendencies have been calculated in respect of the various classifications of the attitudes on education and agriculture and the results are given in table 6 in appendix II.

CHAPTER - XXX

ASSOCIATION BETWEEN THE ATTITUDES OF FARMERS AND THEIR SONS TOWARDS EDUCATION AND FARMING

The results discussed so far were based on the estimation of the number of identical views in the population of farmers and their sons. In this chapter we shall discuss the association between attitudes of farmers and their sons, namely for a given type of attitude of the farmers how the opinions of their sons are distributed and vice-versa. The discussion, firstly, will be for the entire sample of farmers and similar type of association will be discussed according to the classification of the villages on the basis of their characteristics as given in section 2.6 chapter II. Both the characters i.e. education and agriculture have been dealt with separately. The cell frequencies according to various type of classifications have been presented in tables 7 to 13 for education and in tables 14 to 21 for agriculture in appendix-II.

3.1 In case of farmers who had unfavourable opinions towards education, the distribution of favourable and unfavourable opinions of their sons was as 1.3:1 i.e. out of 43, 26 sons had favourable opinions and remaining had unfavourable opinions towards education. When farmers had favourable views, the views of sons of the farmers were in the ratio 3.3:1 for favourable as those for against.

The fathers, of sons with unfavourable opinions towards education were in the ratio 2.6:1 approximately in favour of education, while they were in a ratio 5.3:1 approximately in favour of education, when sons had favourable opinions for

education. The farmers were inclined, more for education as compared to their sons. This is perhaps because the farmers, on the basis of their longer experience in life, were in a better positions to appreciate the utility of education in life than the sons with premature experience of life.

3.2. Distance of the village

3.2.1. When the group of villages which were load than ten kms. from the nearest city was studied, it was found that when the fathers had an unfavourable opinion towards education, the favourable and unfavourable opinions of sons were more or less evenly distributed.

The sons of farmers with favourable opinions were in favour of education in the ratio 3:1 approximately. The opinions of farmers in favour of education, when sons showed unfavourable attitude were approximately 2:1. However, when the sons had a favourable attitude towards education, the farmers were in favour of education more than six times of the farmers who did not favour education out of 92, 45 farmers had favourable and remaining unfavourable opinions.

3.2.2. When the pooled group of those villages which are more than ten kms. away from the city was studied, it was found that the opinions of the sons, of those farmers who had unfavourable opinions for education, were in the ratio 1.3:1.0.

Similarly, when farmers had favourable attitude towards education, the opinions of the sons were in ratio 3.3:1.0 approximately.

when the sons had unfavourable opinions for education, the farmers favoured more than twice the number of those who were not in favour of education. The fathers of those sons who had favourable opinions, had favourable and unfavourable opinions in ratio 3:1 approximately.

From above discussions it can be concluded that the distance of villages from the nearest city had almost no effect on the attitudes of the sons but it showed some positive tendency for the opinions of the farmers towards education. This may be attributed to the sons wasting more time in going and coming from their schools and hence unable to give due consideration to farming.

3.3. Area under Irrigation.

3.3.1. When the study was carried out for villages pooled according to the proportion of irrigated area it was found that the sons of the farmers with unfavourable opinions for education, had favourable and unfavourable opinions in the ratio 1.3:1.0. When farmers' favourable opinions were considered, the opinions of their sons were in ratio 2:1 approximately in favour of and against education respectively.

When unfavourable opinions of the sons were considered, the number of fathers favouring education was 3 times of those with unfavourable opinions for education, similarly number of fathers favouring education was 4 times that of fathers with unfavourable opinions for education, when the sons favourable opinions were taken into account.

3.3.2. For villages with partially irrigated areas, it was found that when farmers opined 'poor' for education, the sons were more or less evenly distributed in their opinion towards education. When farmers had favourable opinion the ratio of sons favourable and unfavourable opinions was as high as 6:1. This means that the fathers attitude reflected on the sons attitude. The lack of irrigation facilities, tended to make both the farmers and their sons inclined towards education.

Similarly, unfavourable opinions of the sons, when studied simultaneously with that of fathers, indicated that the favourable and unfavourable opinions of farmers were as 2:1 - when sons favourable opinions were studied the fathers favoured education in the ratio 4:1 approximately.

It can be concluded that in partly irrigated areas all the fathers and the sons were inclined towards education. This type of result is justified in view of the fact that farmers with some unirrigated land, have a lower productivity as compared to the farmers who have assured irrigation facilities.

3.4. Educational facilities.

3.4.1. In case of villages where schools existed the opinions of the sons; of farmers having unfavourable opinions, were more or less evenly distributed. But while fathers had favourable opinion towards education, the opinions of sons of those farmers were more than four times of the number of poor opinions.

Similarly when the unfavourable opinions of the sons were examined, the favourable and unfavourable opinions of farmers were divided in the ratio 1.5:1.

A scrutiny of the favourable opinions of sons indicated that the fathers having favourable opinions for education were almost 7.5 times of those against education.

3.4.2. In the case of villages where schools did not exist, it was found that the sons were in favour and against education in the ratio 1.7:1.0, when the fathers opined against education. The opinions of sons, of those fathers who had favourable opinions for education, were divided in the ration 3:1 approximately for and against education. When the unfavourable opinions of the sons were studied, it was found that among their fathers those favouring education were about three times of those not favouring education, as against 31 favourable opinions, the unfavourable opinions were only 11.

Similarly when the number of favourable opinions of the sons were examined, the favourable opinions of fathers were approximately 5 times of those having unfavourable opinions.

However, on examining the two different groups, it was found that the existence or not of the schools in the villages did not affect the overall attitudes towards education either of the sons or of the fathers.

3.5. Education of the farmers

3.5.1. In case of villages with more than 30 percent educated farmers, corresponding to unfavourable opinions of the farmers towards education, the favourable and unfavourable opinions of the sons were more or less evenly distributed. When farmers favoured education, the sons favourable and unfavourable opinions were in the ratio 3:1 approximately.

Similarly for the favourable opinions of the sons, the opinions of fathers were more or less evenly distributed for and against education. However, when the sons showed inclination for education, the fathers who favoured education was more than four times of those who did not favour education.

3.3.2. In case of villages in which less than 30 percent farmers were educated, the number of sons who favoured education was 1.7 times of those who were against it the opinions of farmers themselves being unfavourable towards education. While the farmers were for education the sons favourable and unfavourable opinions were in the ratio 3:1 approximately.

However, when the sons opined against education, the number of fathers who favoured education was three times of those who were against it. When the sons were for education, the fathers opinions in favour of education were almost six times of those against it.

On comparing the frequencies of two groups it was interesting to notice that the uneducated farmers and their sons were inclined to education more than the educated farmers and their sons.

3.6. Availability of labour.

3.6.1. When the villages were studied according to the availability of labour within the villages it was found that in villages where labour availability was more the sons of farmers with unfavourable opinions for education, were slightly more inclined towards education as compared to those who were against education. The sons of farmers with favourable opinions on being examined showed

that the number of those who favoured education was four times of those who did not favour.

The favourable and unfavourable opinions of the farmers were in the ratio 2:1 corresponding to the unfavourable views of their sons regarding education. This ratio was 5:1 approximately when the favourable opinions of the sons were studied.

3.6.2. In case of villages where availability of labour within the villages was less than 50 percent it was found that the sons of fathers with poor opinions, were inclined towards education were 1.5 times of those who were against. When the sons of farmers with favourable opinions were contacted , it was seen that the ratio of favourable and unfavourable opinions of the sons were in the ratio 3.5:1 approximately. Out of 29 unfavourable opinions from the sons, the study of the fathers opinions indicated that good and poor opinions were in ratio of 2.7:1. However, when the sons favoured education, the number of farmers having favourable opinions for education was six times of the number of fathers against education.

On comparing the frequencies of two groups of villages, it appears that the availability of labour within the villages had no appreciable effect on the views expressed by both, the fathers and the sons, but if we examine it more critically we find that the availability of labour affected the views of fathers to a considerable extent. Because when the availability of labour in the villages is less the fathers find it difficult to spare their sons for education and depend more on them for the requirement of labour for agriculture.

3.7. Availability of agricultural inputs.

3.7.1. When the villages were studied according to the availability of agricultural inputs within villages it was found that the sons of farmers with unfavourable opinions for education, also showed the same opinions in greater numbers i.e. the ratio of the sons with favourable opinions and unfavourable opinions for education was 1:1.3 approximately. The favourable opinions of the farmers, when analysed according to the sons response, indicated that the sons who favoured education were more than two times of those who were against.

Corresponding to the poor opinions of the sons, the favourable and unfavourable opinions of the fathers were evenly distributed. When the sons showed inclination for education it was found that the number of fathers favouring education was more than four times the number of those against it.

3.7.2. In the villages where the availability of agricultural inputs were less, in that case the sons of farmers with unfavourable opinions for education, had a ratio 3:1 approximately for education. When favourable opinions from the farmers were studied, it was found that the sons favouring education were four-times of those against it.

As is obvious from the results, when the unfavourable responses of the sons were studied, the fathers were overwhelmingly in favour of education. And when the favourable opinions expressed by the sons were examined, the opinions of the fathers were more or less of similar type.

A comparison of frequencies indicate that in villages where availability of the agricultural inputs was more, the fathers and sons both did not show much interest in education. The reasons being that in such villages farming is profitable. For getting good returns from agriculture availability of inputs is essential. Lack of availability of such inputs is bound to create a negative attitude towards farming among farmers and their sons.

FARMING

As in the case of education, the attitudes of farmers and their sons towards farming, as influenced by the various factors, that were considered earlier, were also studied and details are given in following paragraphs.

3.8. In case of farmers who had unfavourable opinions towards farming, the distribution of favourable and unfavourable opinions of their sons was as 1:3.2 approx. When farmers had favourable opinions, the favourable and unfavourable views of sons were in the ratio 1:4:1.

The fathers of sons with unfavourable opinions towards farming were in the ratio 1:1.6 approximately in favour and against farming, while they were in a ratio 2.8:1 approximately in favour and against farming when the sons had favourable opinions for farming.

3.9. Distance of village from the nearest City:

3.9.1 In villages situated at a distance of more than ten Kms. from the city, it was found that in case of farmers who were against farming, the opinions were approximately three times of good opinions. When the favourable opinions of fathers were considered it was found the sons also showed interest in farming, the

ratio between favourable and unfavourable opinions being 1.7:1.0.

Unfavourable opinions from the sons when examined showed a tendency as observed in case of fathers. The fathers were found to be against farming with favourable and unfavourable ratio as 1:1.3. Favourable opinions from the sons, when scrutinized indicated that the farmers opined in favour of farming 3.5 times of those against.

3.9.2 In villages more than ten Kms. away from the city it was found that the sons of farmers with unfavourable opinions, were in a ratio 1:3 approximately in favour of and against farming. The sons tendency was similar to that of fathers corresponding to the favourable opinions of the fathers.

Out of the total opinions of the sons that were expressed against farming, good to poor views ratio of fathers was found to be about 1:1.6. Similarly when the favourable opinions of the sons were studied, it was found that the fathers in favour of farming were 2.5 times of those who were against it.

On comparing the two groups it was concluded that, fathers and sons residing in villages more than ten Kms. from the city showed almost same tendency towards adoption of farming as in the villages less than ten Kms. from the city.

3.10 Area under irrigation:

3.10.1 In case of villages with entire area under irrigation, it was found that the unfavourable opinions of the fathers were divided between favourable and unfavourable opinions of the sons in the ratio 1:3 approximately. The favourable opinions of farmers were shared evenly by good and poor opinions of the sons.

A similar tendency was observed in case of the unfavourable opinions of sons, the favourable and unfavourable views of fathers were in the ratio 1:3. The number of favourable opinions of the

sons for farming were shared evenly by the good and the poor attitudes of the fathers towards it.

3.10.2 In case of villages with part of area irrigated, it was found that the unfavourable opinions of the farmers to farming were shared by good and poor opinions of the sons in the ratio 1:4 approximately. The favourable tendency among farmers was more or less evenly divided over favourable and unfavourable opinions of the sons.

In case of sons whose views were against farming, good opinions of fathers were slightly more than the poor opinions. However, the opinions of the sons in favour showed that the inclination of fathers towards farming was almost five times of that against it.

3.11. Educational facilities

3.11.1 When the group of villages in which the schools existed was studied, it was found that while all the farmers were against farming, in case of sons, only one out of 29 was in favour of farming. However, when the favourable attitudes of the farmers were examined, the sons corresponding to good and poor opinions were in ratio 4.5:1 approximately.

Out of unfavourable opinions of sons, it was observed that the favourable and unfavourable opinions of the fathers were in ratio 1:3 approximately.

3.11.2 When the villages in which schools did not exist were examined, it was found that for unfavourable opinions of fathers towards farming the sons good and poor opinions were in ratio 1:2 approximately. The favourable opinions of the farmers were shared more or less evenly between the favourable and unfavourable opinions of the sons.

The fathers, of sons who had unfavourable opinions to farming, also showed the same tendency. However, when favourable opinions of sons were considered, the ratio of good to poor opinions of fathers was 1.4:1.

On comparing the two groups, one can well realise that regarding farming, the views of farmers and their sons have considerable resemblence.

3.12 Education of farmers:

3.12.1 In the villages where more than thirty per cent of farmers were educated, it was found that when farmers opined against farming the sons also indicated a similar tendency. The unfavourable opinions of sons were three times the number of favourable opinions. Although farmers favoured farming, yet sons were against farming.

When the sons unfavourable attitudes were studied, the favourable and unfavourable opinions of the farmers were in the ratio 1:2.5 approximately. However, the favourable opinions of sons were equally divided between good and poor attitudes of fathers.

3.12.2 In the villages where less than thirty per cent farmers were educated, it was found that the sons, of farmers with unfavourable opinions also tended to be similar to their fathers in this respect, the ratio of poor and good opinions was 3.7:1. The favourable opinions of farmers, as analysed by the thinking of sons, indicated that they were almost evenly divided in favour and against farming.

When opinions of the sons were against farming the fathers

favourable and unfavourable opinions were almost evenly distributed in favour and against the farming, ratio being 1.2:1. However, a study of favourable opinions of the sons showed that the number of fathers who favoured farming was more than four times of those who had unfavourable opinions to farming.

On assessing the attitudes of the two groups, it appears that in the areas where the percentage of educated farmers was more than 30 per cent the fathers were in favour of farming. Thus it can be concluded that the larger proportion of educated farmers had *no appreciable effect on the views of the farmers* and sons on farming at least.

3.13. Availability of agricultural inputs:

3.13.1 In the group of villages where agricultural inputs were easily available it was found that among the sons of farmers with unfavourable opinions, favourable and unfavourable opinions were in ratio 1:1.75. The favourable opinions of the farmers were also found to reflect on these opinions of sons as in the previous case. The ratio in favour of and against farming being 1.6:1. However, the unfavourable opinions of the sons were found to be equally divided between favourable and unfavourable opinions of fathers. When the sons favoured farming, the favourable opinions of the fathers were 2.4 times more of those against farming.

3.13.2 In the group of villages in which agricultural inputs were not easily available, it was found that the sons of farmers with unfavourable and favourable views on farming were in the ratio 3.5:1 approximately. However, the favourable opinions of the farmers were evenly distributed between favourable

and unfavourable opinions of the sons.

The unfavourable and favourable opinions of the sons divided the favourable opinions of the fathers in ratio 2:1 approximately while corresponding distribution of the unfavourable opinions of the fathers was as 3:1.

It can be concluded that the farmers and sons, in villages in which agricultural inputs were available easily favoured farming against those who resided in villages where agricultural inputs were not available easily.

3.14 Availability of labour

3.14.1 In the group of villages in which the labour was available easily, it was found that when farmers had no charm for farming, the sons favourable and unfavourable opinions were in the ratio 1:2.3 approximately. However, the favourable opinions of fathers more or less were evenly distributed among the poor and good opinions of sons towards farming.

When unfavourable opinions of the sons were seen, the ratio of favourable and unfavourable opinions of fathers was 1:2 approximately. The fathers showed more interest for farming when the favourable opinions of the sons were studied, the ratio of views in favour of and against farming being 1.4:1.

3.14.2 In villages belonging to the other class it was found that the sons, of farmers with unfavourable opinions towards farming, showed that unfavourable opinions to favourable opinions were as 3:1. This indicated that the majority of the sons agreed with the views of fathers. For favourable opinions of farmers, the favourable and unfavourable opinions of the sons were in the ratio 1.4:1. However, when the sons expressed their views against farming, the fathers were found to be almost equally inclined

in both directions. When the sons favoured farming, the fathers in favour of farming were seven times more than those against farming.

From the above discussion, it can be infered that in both groups of villages farmers and their sons resembled in their views.

3.13 Measure of association between the attitudes of farmers and their sons on education and farming

So far we have discussed the association between the attitudes of farmers and their sons on education and farming by comparing the observed frequencies in the sample. The association between these two can also be measured mathematically. For a two by two contingency table of the type given below:

Attitudes of farmers

Attitudes of sons		Good (A)	Poor (α)	Total
	Good (B)	a	b	a+b
	Poor (β)	c	d	c+d
	Total	a+c	b+d	a+b+c+d (= N)

Yule (1968) has defined the following measure of association

$$Q = \frac{ad - bc}{ad + bc}$$

where a, b, c and d denote the observed frequencies in the various classes. The values of Q were calculated both for education and farming seperately. Q can have any value between -1 and +1. As the value of Q departs from zero in either direc-

tion it indicates increasing association between the attributes A and B. A zero value of Q will however indicate that attributes A and B are independent. The values of Q obtained from the observed data were 0.414 and 0.602 for education and farming respectively which indicate considerable association between attitudes of farmers and their sons on the two characters studied.

The values of Q were also calculated on the basis of the classification of the villages according to the various factors given in section 2.6 chapter II, and are given in table 7.

3.16 Test of independence of the attitudes of farmers and their sons on education and farming

On the hypothesis that there is no association between the two attributes, the expected frequencies in the various classes can be obtained as follows:

$$E(a) = \frac{(a+b)(a+c)}{N}, \quad E(b) = \frac{(a+b)(b+d)}{N}$$

$$E(c) = \frac{(c+d)(a+c)}{N}, \quad E(d) = \frac{(c+d)(b+d)}{N}$$

Using the observed and expected cell frequencies the value of chiequare can be worked out as follows:

$$\chi^2_{(1)} = \sum_{i=1}^{n} \frac{(O_i - E_i)^2}{E_i}$$

where O_i and E_i denote the observed and expected frequencies respectively in the ith class.

In case of two by two contingency table the above formula simplifies to

$$\chi^2_{(1)} = \frac{(ad-bc)^2 N}{(a+b)(a+c)(b+d)(c+d)}$$

and the values of chisquare for education and farming were 6.6 and 15.9 respectively.

From the table of chisquare values, we find that the five and one per cent values of chisquare corresponding to one degree of freedom are 3.41 and 6.61. Thus we see that the hypothesis of independence of the attitudes of farmers and their sons is not true.

The values of chisquare, were also calculated on the basis of classification of villages according to the various factors, are presented in table 8. It is seen that in most cases the calculated values of chisquare were significant indicating association between the attitudes of farmers and their sons on farming and education.

3.17 Study of preferences for education and farming

The preferences for given characters can be studied by calculating the correlation coefficient based on the ranks which the individuals in the sample assign to the characters studied according to the degree of their preferences for those characters.

Rank correlation:

When a number of individuals are arranged according to some quality which they all posses to a varying degree, they are said to be ranked. It is customary to denote the ranks by ordinal numbers 1, 2, ..., n. where n is the number of objects. Thus an object or individual which comes fifth in the ranking has the rank five. Suppose we have two characters and individuals are ranked according to their preferences for these characters. What we wish to do is to measure the degree of correspondence between these two ranking so as to measure the intensity of rank correlation. In practical applications of ranking methods, there sometimes arise cases where two or more individuals are

said to be tied. The method which is adopted for allocating rank numbers to tied individuals is to average the ranks which they would possess if they were distinguishable eg. if the observer ties 3rd and 4th member, each is allotted the number 3½ and if he ties the 2nd to 7th all inclusive, each is allotted the number 1/6 (2+3+4+5+6+7) = 4½. This is sometimes known as "mid rank" method. There is another way of looking at the problem of tied ranks. Suppose we regard any tied set t as due to inability to distinguish real differences. We turn to consider the analogous problem for the rank correlation coefficient. If there are sets of ties, the two ranking typified by t and u, s we define,

$$T' = \frac{1}{12}\sum (t^3 - t)$$

$$U' = \frac{1}{12}\sum (u^3 - u)$$

Then we have the rank correlation coefficient ρ defined by Spearman as

$$\rho = 1 - \frac{6\left(\sum_{i=1}^{n} d_i^2 + T' + U'\right)}{(n^3 - n)} \quad \ldots\ldots\ 3.17.1$$

The concept of rank correlation was made use of in studying the attitude of farmers and their sons towards education and farming. In the selected villages information was collected from both farmers and their sons regarding their attitudes towards education and farming. The attitudes were broadly classified into four classes i.e "Very Good", "Good", "Fair" and "Poor" and corresponding ranks were as 1,2,3 and 4 allotted. Then the ranks were

adjusted for ties. Using formula 3.17.1, correlation coefficients were calculated separately for fathers and sons between their attitudes towards education and farming. The value of the rank correlation coefficient can lie between -1 and +1. A value of rank correlation near to zero will indicate that there is no relationship between the preferences for the characters studied. A high positive or negative value of rank correlation coefficient will however indicate that there is a very high correlation between the preferences for the two characters. A negative value will indicate that the preferences for the two are in opposite direction i.e. if the preference of one increases the preference for the other decreases.

From the observed data the values of the rank correlation coefficient obtained were:

farmers : 0.747

sons : 0.649

Thus we see that there was a high positive correlation between the preferences of both the farmers and their sons for education as well as farming. In other words either they were in favour of both education and farming or against both.

3.19 Study of joint association of attributes

So far we have tried to study as to what extent a father and his son agree in their attitude towards education and farming separately. This study has thrown some light on the change in attitude to farming with advancement of generation with which the spread of education is highly correlated. In the present section an attempt has been made to study the attitudes of farmers and their sons towards education given their views on farming and

vice versa. For this purpose, the data have been presented as in table 9 and 10.

The data formerly presented in two by two table corresponding to favourable and unfavourable attitudes of farmers and their sons towards education, say, have subsequently been sub divided. Frequencies in each cell have been broken in four components to show the attitudes of persons in that cell towards farming.

3.18.1 An examination of table 9 reveals that very little proportion of farmers and their sons who had both favourable attitude towards education were having favourable attitudes towards farming. This is also true in the case of farmers with poor opinions and sons with favourable opinions towards education.

3.18.2 The frequencies in table 10 show that a high proportion of farmers and their sons who had both favourable, or unfavourable attitudes towards farming were having favourable attitudes towards education.

By observing these two one can conclude that when both had favourable opinions for farming they had also good opinions for education. But when both had favourable opinions for education they did not show more interest in farming.

3.18.3 In order to measure joint association (of farmers' and their sons' opinions) regarding two characters, education and farming, it seems that no method is available in literature so far. It can, however, be easily seen that an index of joint association can be easily obtained. For this purpose we first give the following symbolic presentation of data.

Opinions of farmers on education

			Favourable			Unfavourable		
			Views on Farming					
			Good	Poor	Total	Good	Poor	Total
		Good	a_{11}	a_{12}	$a_{1.}$	b_{11}	b_{12}	$b_{1.}$
Favourable	Views on Farming	Poor	a_{21}	a_{22}	$a_{2.}$	b_{21}	b_{22}	$b_{2.}$
		Total	$a_{.1}$	$a_{.2}$	a	$b_{.1}$	$b_{.2}$	b
Unfavourable		Good	c_{11}	c_{12}	$c_{1.}$	d_{11}	d_{12}	$d_{1.}$
		Poor	c_{21}	c_{22}	$c_{2.}$	d_{21}	d_{22}	$d_{2.}$
		Total	$c_{.1}$	$c_{.2}$	c	$d_{.1}$	$d_{.2}$	d

With the help of the above table,

$Q_1 = \frac{a_{11} + b_{12} + c_{21} + d_{22}}{a + b + c + d}$ can be used as measure of joint association of identical views on farming and education because here numerator indicates the number of cases in which both farmers and their sons expressed identical views towards education and farming both. Similarly the index $Q_2 = \frac{a_{22} + b_{21} + c_{12} + d_{11}}{a + b + c + d}$ can be taken as a measure of joint association on joint views, towards education and farming. The data collected in the enquiry have been presented in the tables 9 and 10. The values of the coefficients Q_1 and Q_2 were 0.235 and 0.291 respectively.

CHAPTER - XV - SUMMARY AND CONCLUSION

Immense progress in the field of agriculture, and spread of education in the recent years, has generated the curiosity to know as to how the outlook of the farming community towards agriculture is changing with the increase in education among them. A study of this nature may give a clue, about the future prospects of agriculture in the context of developing educational system in the country.

One such study was conducted in the Aligarh district of Uttar Pradesh, which is also one of the districts covered under the intensive agricultural district programme (I.A.D.P). The approach of Snowball Sampling, originally suggested by Coleman and further developed by Goodman, was made use of in the study. A sample of 230 farmers was selected using three stage random sampling design. The primary sampling units were community development blocks, the second stage units were villages and the ultimate sampling units were farmers. The average number of identical views for and against education and agriculture were calculated. The average number of identical views for education was 102.27 (83.82 favourable and 18.45 unfavourable) and average number of non-identical views per village for education was 42.52. Similarly the average number of identical views for agriculture was 92.65 (43.33 favourable and 49.32 unfavourable) and average number of non-identical views on agriculture was 52.06.

It has been found that a majority of farmers and their sons were more inclined towards education than agriculture which is an indication that there is a tendency among the farmers to deviate from agriculture. The identity of views among farmers and their sons was also studied, according to various factors such as: Distance of village from the nearest city, area under irrigation, educational facilities, literacy of the farmers, availability of agricultural inputs and availability of labour in the villages which are likely to affect the views of farmers and their sons on education and agriculture.

In case of education, the distance of villages from the nearest city influenced the opinions of the farmers. In entirely irrigated tracts they favoured farming. In villages where no schools existed they favoured education because of the charm it had for the residents. A similar trend was also noticed among uneducated farmers. When inputs were available they did not show much interest in education, availability of labour also influenced the opinions of farmers.

When the same type of study was carried out to study the attitude towards farming, it was observed that the distance of village from the nearest city and irrigation facilities again played similar roles, when educational facilities were not available, they opined for farming. The factors like availability of agricultural inputs and labour, did not show their due influence, although they were supposed to be very important factors as far as farming was concerned. This may lead one to think that future of agriculture is in danger with the

spread of education. However, since the results are based on a rather small sample of farmers, the study may not be considered conclusive and will need more detailed investigations.

Using the chance model introduced by Nicholls, William , the tendency of expressing the views on education and farming, was also measured which indicated that the opinions of farmers and their sons were, to some extent, influenced by their environment.

The association between attitudes of farmers and their sons, e.g. the distribution of sons' opinions for given views of fathers and viceversa was also studied. For this purpose the coefficient of association between the attitudes of farmers and their sons on education and agriculture were worked out. The coefficients of association were fairly high. The independence of the attitudes of farmers and their sons on education and agriculture was tested by calculating chisquare values. The calculated values of chisquare were mostly significant, thus discrediting the hypotheais of independence. It may therefore be concluded that the views of farmers and their sons on education and agriculture were not independent.

Preferences of the farmers and their sons for education and farming were studied with the help of rank correlation coefficient. The farmers and their sons were ranked according to their views on education and agriculture. The ranks given were 'very good' (1), 'Good' (2), 'Fair((3) and 'Poor' (4). In case of ties 'mid rank' method was used. The values of the rank correlation coefficient for farmers and their sons

were 0.747 and 0.640 respectively, which indicate that farmers and their sons either favoured education and farming, both, or were against both. The study of association of attitudes show that the views of sons on education and agriculture are dependent on the views of farmers. It is therefore necessary to mould the views of farmers favourably on these two characters. The attitudes of farmers and their sons towards education given their views on farming or vice-versa showed that a high proportion of both also liked education when they opined for farming but a low proportion of them favoured farming when they opined for education.

APPENDIX - I

APPENDIX-I

Schedule No. 1

Name of village Name of Block

Information regarding farmer.

Name of selected farmer	His age	Size of holding			Highest Examination passed	Reasons to stop study			View regarding profession	
		Irri.	Unirr.	Total		fami. circum.	No interest	Not useful	Favourable	Unfavourable

Reasons for this view	Crops grown in the		
	Present Rabi Season	Previous Rabi Season	Previous Kharif Season

Schedule No.2

Information regarding family members from the farmer.

Sr. No. of farmer	Family member with Ages	Highest Examination passed	Whether you want them to continue studies	Reasons if continue	Reasons if stopped	Opinion regarding education	
						Favourable	Unfavourable

You want one or more children should		If go to farm, do you feel	
Go to school	Go to farm	Education does not help farming	You require more labourer

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Schedule No.3.

Information from the family members

Sl. No. of farmer	Name of the son	Age	Highest Examination passed	How do they find education		Reasons for this view.	How do they find Agriculture	
				Good	Poor		Good	Poor

Reasons for this view	Whether he would continue cultivation			If school going what time do they spent for farm activities.
	Surely	May or May not	will not	

Schedule No. 4

Information about the selected villages

Name of Selected Village	Distance from nearest city	Area in acres	Irrigated Area	Unirrigated Area	Sources of Irrigation	No. of Schools in the Village	Percentage educated farmers in the village	Marketing facilities	Labour available in the village	Agricultural inputs available/not available

Appendix - II

Table - 1.

Average number of identical views between farmers and their sons on education.

	Mean	S.E.
Average number of identical views (favourable)	83.82	26.8
Average number of identical views (unfavourable)	18.45	8.8
Average number of identical views (Total)	102.27	20.3
Average number of non-identical views	42.52	8.4

Table No.-2

Average number of identical views between farmers and their sons on farming.

	Mean	S.E.
Average number of identical views (favourable)	43.32	7.2
Average number of identical views (unfavourable)	49.33	37.2
Average number of identical views (Total)	92.65	32.7
Average number of non-identical views	52.65	6.6

Table - 3

Average number of identical (favourable, un-favourable and total) and non identical views on education according to various factors

CHARACTERS	Average number of identical views			Average no. of non-identical views
	Favourable	Un-favourable	Total	
Distance of village from city ≤ 10Kms	87.7	9.0	96.7	44.0
Distance of village from city > 10Kms	83.4	10.0	93.4	47.9
Entire area under cultivation is irrigated	53.3	28.7	81.0	43.8
Part of the area is unirrigated	86.7	11.7	98.4	31.2
Schools exist within villages	67.3	31.8	98.0	49.4
Schools do not exist within villages	83.1	38.6	121.7	23.8
30% of more farmers are educated	75.0	20.0	95.0	41.0
Less than 30% farmers are educated	80.8	15.8	96.6	38.0
50% or more inputs available within villages	75.6	22.8	98.4	37.7
Less than 50% inputs available within villages	85.5	11.6	97.1	39.3
50% or more labour available within villages	94.6	7.6	102.2	36.4
Less than 50% labour available within villages	69.1	28.2	97.3	44.3

Table - 4

Average number of identical (favourable, unfavourable and total) and non identical views on farming according to various factors

FACTORS	Average number of identical views			Average no. of non-identical views
	Favourable	Un-favourable	Total	
Distance of village from city ≤ 10Kms.	50.0	36.7	86.7	45.0
Distance of village from city > 10Kms.	32.8	48.3	81.1	44.1
Entire area under cultivation is irrigated	53.7	33.1	86.8	43.3
Part of the area is unirrigated	36.7	54.2	90.9	41.6
Schools exist within villages	31.8	47.9	70.2	49.0
Schools do not exist within villages	47.1	44.4	91.5	46.3
30% or more farmers are educated	32.0	63.3	95.3	40.0
Less than 30% farmers are educated	46.7	39.7	86.4	43.8
50% or more inputs available within villages	42.7	46.8	89.5	46.7
Less than 50% inputs available within villages	40.1	49.3	89.4	43.7
50% or more avalabour available within villages	48.0	44.1	92.1	38.9
Less than 50% labour available within villages	46.8	43.1	89.9	39.2

Table - 6

Measures of tendency (h) of attitudes of farmers and their sons towards education and farming according to various factors.

FACTORS	Education				Farming			
	Fathers		Sons		Fathers		Sons	
	Good	Poor	Good	Poor	Good	Poor	Good	Poor
Distance of village from city ≤ 10Kms.	-.20	.37	.50	-.22	.25	.40	.40	.40
Distance of village from city > 10Kms.	-.03	.24	.33	.07	.20	.62	.38	.13
Entire area under cultivation is irrigated	-.13	.20	.43	-.17	-.18	.33	.54	-.76
Part of the area is unirrigated	-.02	.30	.44	.13	.24	.45	.42	.18
Schools exist within villages	.06	.22	.54	.20	-.03	.56	.43	.03
Schools do not exist within villages	-.02	.20	.40	-.04	.17	.43	.31	-.02
30% or more farmers are educated	.10	.50	.60	.25	.05	.07	.58	-.19
Less than 30% farmers are educated	.07	.24	.44	-.03	-.05	.50	.54	-.04
50% or more inputs available within villages	-.03	.50	.55	.10	.65	.30	-.10	.50
Less than 50% inputs available within village	-.05	.10	.25	-.05	.03	.57	.53	.01
50% or more labour available within villages	-.03	.30	.42	.08	-.11	.52	.34	.03
Less than 50% labour available within villages	-.05	.30	.46	.04	.13	.50	.33	.03

Table -

Distribution of opinions of farmers and their sons on education and farming

Education

Sons \ Fathers	Good	Poor	Total
Good	142	26	168
Poor	43	19	62
Total	185	45	230

Farming

Sons \ Fathers	Good	Poor	Total
Good	71	25	96
Poor	53	81	134
Total	124	106	230

Distribution of the views of farmers and their sons on education according to various factors

Distance of village from the nearest city

Less than ten Kms.

Sons \ Fathers	Good	Poor	Total
Good	45	7	52
Poor	15	7	22
Total	60	14	74

Greater than ten Kms.

Sons \ Fathers	Good	Poor	Total
Good	97	19	116
Poor	28	12	40
Total	125	31	156

Area under irrigation

Entire area is irrigated

Sons \ Fathers	Good	Poor	Total
Good	32	8	40
Poor	15	5	20
Total	47	13	60

Part of area is irrigated

Sons \ Fathers	Good	Poor	Total
Good	110	18	128
Poor	28	14	42
Total	138	32	170

Schools within the villages

Exist

Sons \ Fathers	Good	Poor	Total
Good	52	7	59
Poor	12	8	20
Total	64	15	79

Do not exist

Sons \ Fathers	Good	Poor	Total
Good	90	19	109
Poor	31	11	42
Total	121	30	151

Education of the farmers

30% or more farmers educated

Sons \ Fathers	Good	Poor	Total
Good	30	7	37
Poor	9	8	17
Total	39	15	54

Less than 30% farmers educated

Sons \ Fathers	Good	Poor	Total
Good	112	19	131
Poor	34	11	45
Total	146	30	176

Availability of agricultural inputs within villages

More than 50% available

Sons \ Fathers	Good	Poor	Total
Good	39	9	48
Poor	18	14	32
Total	57	23	80

Less than 50% available

Sons \ Fathers	Good	Poor	Total
Good	103	17	120
Poor	25	5	30
Total	128	22	150

Availability of labour within villages

More than 50% available

Sons \ Fathers	Good	Poor	Total
Good	70	14	84
Poor	22	11	33
Total	92	25	117

Less than 50% available

Sons \ Fathers	Good	Poor	Total
Good	72	12	84
Poor	21	8	29
Total	93	20	113

Distribution of opinions of farmers and their sons on farming according to various factors

Distance of village from the nearest city

Sons \ Fathers (Less than ten Kms.)	Good	Poor	Total
Good	28	8	36
Poor	16	22	38
Total	44	30	74

Sons \ Fathers (Greater than ten Kms.)	Good	Poor	Total
Good	43	17	60
Poor	37	59	96
Total	80	76	156

Area under irrigation

Sons \ Fathers (Entire area irrigated)	Good	Poor	Total
Good	8	8	16
Poor	9	27	36
Total	17	35	52

Sons \ Fathers (Part of the area irrigated)	Good	Poor	Total
Good	54	11	65
Poor	57	46	103
Total	111	57	168

Schools within villages

Sons \ Fathers (Exist)	Good	Poor	Total
Good	41	1	42
Poor	9	28	37
Total	50	29	79

Sons \ Fathers (Do not exist)	Good	Poor	Total
Good	37	26	63
Poor	33	55	88
Total	70	81	151

Education of the farmers

30% or more farmers educated

Sons \ Fathers	Good	Poor	Total
Good	8	8	16
Poor	11	27	38
Total	19	35	54

Less than 30% farmers educated

Sons \ Fathers	Good	Poor	Total
Good	56	13	69
Poor	59	48	107
Total	115	61	176

Availability of agricultural inputs within villages

50% or more available

Sons \ Fathers	Good	Poor	Total
Good	29	12	41
Poor	18	21	39
Total	47	33	80

Less than 50% available

Sons \ Fathers	Good	Poor	Total
Good	38	12	50
Poor	35	65	100
Total	73	77	150

Availability of labour within the villages

50% or more available

Sons \ Fathers	Good	Poor	Total
Good	27	19	46
Poor	24	47	71
Total	51	66	117

Less than 50% available

Sons \ Fathers	Good	Poor	Total
Good	44	6	50
Poor	31	32	63
Total	75	38	113

Table - 7

Coefficient of association between attitudes of farmers and their sons on education and farming according to various factors

FACTORS	Education	Farming
Distance of village from city ≤ 10Kms.	.233	.581
Distance of village from city > 10Kms.	.373	.609
Entire area is irrigated	.143	.600
Part of the area is unirrigated	.532	.709
Schools exist within villages	.674	.983
Schools do not exist within villages	.254	.414
30% or more farmers are educated	.685	.500
Less than 30% farmers are educated	.317	.556
50% or more inputs available within villages	.566	.444
Less than 50% inputs available within villages	.095	.709
50% or more labour available within villages	.428	.423
Less than 50% labour available within villages	.303	.767

Table - 8

Calculated values of chiacuare according to various factors

FACTORS	Education	Farming
Distance of village from city ≤ 10Kms.	0.609	10.359
Distance of village from city > 10Kms.	3.465	6.077
Entire area is irrigated	0.804	5.934
Part of the area is unirrigated	8.791	41.962
Schools exist within villages	8.301	4.280
Schools do not exist within villages	1.461	6.961
30% or more farmers are educated	6.554	3.246
Less than 30% farmers are educated	2.341	12.340
50% or more inputs available within villages	6.688	4.352
Less than 50% inputs available within villages	0.120	2.758
50% or more labour available within villages	3.917	7.357
Less than 50% labour available within villages	2.618	19.982

Table - 9

Attitude of farmers and their sons towards farming given their views on education

Opinions of sons on education	Views on farming	Opinions of farmers on education: Favourable – Good	Favourable – Poor	Favourable – Total	Unfavourable – Good	Unfavourable – Poor	Unfavourable – Total
Favourable	Good	40	15	55	5	0	5
	Poor	37	50	87	3	18	21
	Total	77	65	142	8	18	26
Unfavourable	Good	21	9	30	5	1	6
	Poor	7	6	13	6	7	13
	Total	28	15	43	11	8	19

Table - 10

Attitude of farmers and their sons towards education given their views on farming

Opinions of Sons on Farming	Views on Education	Opinions of farmers on farming: Favourable			Opinions of farmers on farming: Unfavourable		
		Views on education					
		Good	Poor	Total	Good	Poor	Total
Favourable	Good	40	5	45	15	0	15
	Poor	21	5	26	9	1	10
	Total	61	10	71	24	1	25
Unfavourable	Good	37	3	40	50	18	68
	Poor	7	6	13	6	7	13
	Total	44	9	53	56	25	81

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