CHAPTER SIX

EXPOSURE TO AGRICULTURAL INFORMATION: THE UTILITY OF TRAINING AND VISIT SYSTEM

The re-organized Agricultural Extension System, popularly known as Training and Visit (T and V) system, is expected to serve as an important tool for providing adequate and up to date information on agricultural practices to the farming community in optimizing productivity of selected crops in a particular season. The extent of functioning of the system has been examined here with reference to some key indicators.

Exposure to mass media

Exposure to mass media is an important source of knowledge and information. Most of the impersonal communications take place through print and audio-visual mass media. The printed mass media include newspaper, bulletins, magazines, leaflets and pamphlets etc. The audio-visual media include radio, television, film etc. Demonstration and exhibition are also another sets of impersonal means of communication.

Table 6.1 depicts that about 43 per cent of the respondents were exposed to non-print mass media viz. to radio. The corresponding percentages for television and film were 10 and 14 respectively. Out of total radio listeners only 1.80 per cent farmers listened to it regularly and 0.60 per cent farmers were regular T.V. viewers. About 18 per cent farmers had the habit of reading newspaper, of which 3.20 per cent read newspaper regularly. With regard to the habit of reading magazine only one per cent got the opportunity to go through it. It is observed that the overall use of print and non-print media by the respondents was extremely limited. Low literacy and poor accessibility were found as the two most important contributing factors to the negligible use of

print and non print mass media as their sources of information by the farmers. Demonstration is another source of information to the farmers. About 11 per cent farmers had been exposed to agricultural demonstration programmes.

Table 6.1: Distribution of Respondents according to their Exposure to Mass Media.

Media	Nature of Exposure (In percentage)			Total Respondents Exposed	
	Never	Sometimes	Regularly	No.	Per cent
Radio	57.40	40.80	01.80	213	42.60
Newspaper	82.20	14.60	03.20	89	17.80
Film	86.00	14.00	--	70	14.00
Magazine	99.00	01.00	--	05	01.00
Demonstration	88.80	11.00	00.20	56	11.20
Television	90.00	09.40	00.60	50	10.00

Exposure to Specific Programme

It has been observed from Table 6.1 that 42.60 per cent farmers were exposed to radio programme. Out of total radio listeners 26.60 per cent listened to news programme, 35.60 per cent to *Krishi Kathar Asar* (Agricultural programme) and only 8 per cent to music and other entertainment programmes.

Radio is an important and effective source of agricultural information to the farmers. Radio disseminates information relating to new technology through a special programme meant exclusively for the farmers called *Krishi Kathar Asar* (discussion on agricultural matters). Out of 178 farmers listening to the *Krishi Kathar Asar,* 70.22 per cent of them have learnt from it about certain cultivation techniques of the major crops like paddy, wheat, potato and vegetables; 14.04 about plant protection measures, and 6.74 per cent have acquired some knowledge about fertilizer application techniques . Thus *Krishi Kathar Asar* has appeared to be a popular and helpful programme of radio for the farmers. However, among the radio listeners only 8.98 per cent have failed to learn

anything from the programmes, as they could not follow the technical content of the information broadcasted.

Television with its vision culture reaches people with its new ideas. It may be recalled from Table 6.1 that only 10 per cent farmers were exposed to television programmes. Out of which 9.40 per cent were casual viewers and 0.60 per cent used to enjoy it regularly. Regarding exposure to specific programmes 39 (7.80 per cent) and 22 (4.40 per cent) respondents were exposed to T.V. news and feature films respectively. Surprisingly, only 9 respondents (1.80 per cent) were interested to see *chasbas* (agricultural) programme. Among the viewers of *chasbas* programme of TV, 33.30 per cent respondents got some knowledge about cultivation techniques of the major crops and 11.11 per cent about fertilizer application. However, even when 55.55 per cent respondents had certain exposure to specific agricultural programmes of T.V. they were unable to learn anything from the said telecasts because of high technical content of the message. There is higher exposure to the radio programme than television because of farmers' better access to radio. Lower exposure to agricultural information disseminated through radio and television indicates their poor credibility as impersonal sources of technical information. Agricultural information available from newspaper was often used mostly by educated, wealthy and innovative farmers.

Regarding documentary films screened by the publicity department of information and culture, Govt. of West Bengal, 14 per cent farmers had some exposure to such programmes. Among the documentary viewers, 12.60 per cent watched agriculture related programme, 2.60 per cent literacy programme and 1.20 per cent health and family welfare related films. Of the total viewers of agriculture related documentaries, 46 farmers (73 per cent) acquired some knowledge about cultivation technique of paddy and wheat, three farmers (4.76 per cent) about fertilizer application technique, and one farmer (1.58 per cent)

about procedures of plant protection measures. On the other hand even when 13 viewers (20.63 per cent) failed to internalize the subject matter projected they enjoyed the documentary film show. Internalization of the messages of documentaries often becomes difficult because of language problem, low level of literacy of the spectators, technical terms used in programme, and infrequent exposure to such show which is held irregularly.

On agricultural matters, the printed media like newspaper, magazine, etc., have a limited impact on the farmers. Out of the total respondents 14.60 per cent had the habit of reading newspaper 'sometimes' and only 3.20 per cent used to read newspaper 'regularly'. Daily events and *chasbas* (agriculture) column were the major subjects of interest to the farmers who were literate and used to read newspaper more or less regularly. Regarding preferred news items in the newspaper, 15.40 per cent farmers were interested to read daily events and only 6.20 per cent were to agricultural column. From the agricultural column 80.64 per cent farmers learnt about the cultivation procedures of paddy, potato and vegetables, 12.90 per cent got some idea about plant protection measures, and only 6.45 per cent learnt some techniques of fertilizer application(see Table 6.2). Very insignificant proportion of farmers (about one per cent) used to read magazines and other books. But to them such magazines and books were not the sources of any agricultural information.

The use of mass media by farmers of the two northern districts is not as extensive as those of the developed countries. Their use as a source of information is mostly confined to a small group of educated, affluent and innovative farmers. The majority of farmers of the two districts were least depended on impersonal sources of communication in obtaining agricultural information. But as far as the media like radio, television and films are concerned the farmers who have access to those, certain proportion of them had been able

to learn some new ~~the~~ methods of cultivation, the technology of fertilizer application and plant protection measures from those mass media.

For agricultural extension, demonstration is often considered as a powerful medium of communication. It provides the farmers an opportunity to have a direct and first hand familiarity with the nature, form, use and results of agricultural innovations. But among the respondents of two North Bengal districts only 11.20 per cent of them actually got the opportunity to witness the result of demonstration programme. From their first contact with the demonstration programme, 76.78 per cent of the farmers learnt about cultivation procedure of paddy, wheat and jute; 12.50 per cent about plant protection measures and only 8.92 per cent about scientific method of fertilizer application. However, only about 2 per cent of the respondents did not find agricultural demonstration programme as useful at all(see Table 6.2). But on the whole, the demonstration of an agricultural innovation appeared somewhat reliable and useful source of information to the majority of the farmers.

Table 6.2: Distribution of Respondents by Media Exposure and Type of Agricultural Knowledge Acquired from Mass-Media (Distribution in Percentage)

Type of Media	Total Respondents Exposed to Particular Media	Type of Lessons Received from Mass Media			
		Plant Protection Measures	Cultivation Technique	Fertilizer Application Technique	No Lesson
Radio	178	14.02	70.22	06.74	08.98
Newspaper	31	12.90	80.64	06.45	—
Film	63	01.58	73.01	04.76	20.63
Book	---	---	---	---	—
Television	09	---	33.33	11.11	55.55
Demonstration	56	12.50	76.78	08.92	01.78

Exposure to training programmes

The prime objective of training to farmers is to motivate them in adopting technologies conducive for higher production, more income and better living. Farmers are trained to upgrade their knowledge and skill. The Department of Agriculture organises training camps in every year at the district, block and village levels for imparting latest farm technology to the farmers especially in *Rabi* and *Kharif* seasons. In addition to special training camps, various crop production camps are also organised by the state agricultural university, leading pesticide companies and development agencies such as IFFCO, KRIBHCO etc.; to disseminate new agricultural technology among the farmers.

In the two districts under study about 75 per cent of cultivators had knowledge about farmers training camps. Even then only 19 per cent of farmers had actually undergone through such training. Farmers training camps had been organised at the office of the Agricultural Farms, Gram Panchayat Office and at Agricultural University (North Bengal campus at Pundibari, Cooch Behar). Maximum number of farmers were trained at Gram Panchayat Office. The technical knowledges acquired from such training camps were pertaining to irrigation and water management necessary for major food crops, specific cultivation techniques and inter-cultural practices involved in different stages of agricultural operations, and pest control devices. Agricultural farm office has been identified as the best demonstration camp site where the majority of the trainees had acquired knowledge about the scientific techniques of cultivation. At Gram Panchayat level, in total 86 farmers were trained of whom 49 (56.97%) learnt about pest control method and 33(38.37%) about cultivation technique of food crops. Farmers training camps are organised by the extension wing of Agricultural University at Pundibari. This university has its own research farm where on-farm testing of new technology was conducted. Eleven respondents attended the said training camp and from where majority of them learnt about

Table 6.3 : Distribution of Respondents by their Training Places and Topics they Learnt

Place of Training	Number of Respondent Attended	Type of Training Attended					
		Irrigation and water Management		Cultivation Technique		Plant Protection Measures	
		No.	Percentage	No.	Percentage	No.	Percentage
Agricultural Farm office	11	01	0.20	10	2.00	00	0.00
Gram Panchayat office	86	04	0.80	33	6.60	49	9.80
Agricultural University	11	01	0.20	09	1.80	01	0.20

several new cultivation techniques. It can be seen from Table 6.3 that a bulk of respondent farmers were still remain untrained and there is a need to organize more training camps to upgrade the knowledge of those farmers. However, it is important to note that a good number of participant farmers had not been properly trained. Their post-training follow-up measures and rate of adoption were not all that satisfactory because they were unable to internalize the lessons offered in the training camps. It warrants for sustained efforts to improve the training forms of communication for diffusion of agricultural innovations more effectively.

Participation to minikit programme

In every year a number of new varieties of seeds in cereals, pulses, vegetables and oilseeds are released by the agricultural department of the governments. These varieties seldom reach the farmers quickly. It is very difficult for the department of agriculture and the agricultural universities to produce large quantity of seeds and supply them to needy farmers within a short time. The main objective of minikit programme is to distribute small quantity of new varieties of seeds to farmers at different localities so that they can multiply and later redistribute the same to other farmers in their area.

The success of the minikit programme depends upon the actual knowledge of the farmers about this particular programme. When the respondents were asked whether they know about the programme of minikit distribution by the department of agriculture or not, 99 per cent of them were found quite aware about the said programme whereas 34 per cent of farmers had actually got the minikit.

It is evident from Table 6.4 that in the year 1994, a small proportion of farmers had received minikit for different crops. However, in the year 1995, the proportion of recipients of minikit had increased marginally.

Table 6.4: Percentage Distribution of Recipients of Inputs (Distribution out of Total Respondents)

Year	Type of Minikit Seeds Received					
	Jute	Paddy	Wheat	Pulse	Mustard	Vegetable
1994	1.00	1.40	4.00	0.60	2.00	1.00
1995	7.00	4.80	10.00	2.40	6.20	3.60

The minikit recipients were asked to record their general opinion about the said programme. Among them 46.47 per cent opined that the seeds (minikits) supplied to them were timely. However, majority (95.88 per cent) of the farmers were in view that the amount of seeds they received as minikit was inadequate. They also suggested that for achieving success in minikit programme, good quality seeds and other supportive inputs like fertilizer etc., need to reach the farmers in sufficient quantities before the commencement of the cropping season. Owing to better extension services, almost all the farmers have some knowledge about government sponsored minikit programme and there is a consistent and high demand for minikits among the farmers in augmenting their agricultural production.

Participation to agricultural fairs and demonstrations

Participation to agricultural fairs and demonstration programmes indicates the farmers' nature of interest and mind set in farm activities. Various types of meeting through fairs and demonstrations are held in order to facilitate and enhance the knowledgeability about new technology. These are held periodically at different levels.

Agricultural demonstration often helps identifying and countering certain technological constraints that adversely affect the productivity. By observing, doing and hearing from such a demonstration, the farmers learnt about the use

of certain new technologies. Despite the educative potentiality of demonstration as a powerful medium of communication, only 11.20 per cent of farmers had attended such demonstration programme. Thus as far as the demonstration is concerned the prevailing situation is not encouraging and call for further efforts to improve.

With reference to participation in the agricultural fair and exhibition, only 11.60 per cent farmers had such an exposure. However, it is true that village level agricultural fairs and exhibitions are not held quite frequently or regularly. Shah and Patel, (1970) in their study in Gujarat villages found agricultural fairs as an important source of information. They observed that those farmers who were found to visit agricultural fairs and exhibitions more frequently were not average farmers but mostly progressive cultivators and opinion leaders.

The farmers were asked that to what extent they found printed materials like pamphlets, leaflets, and folders distributed in agricultural fairs and exhibitions as useful source of information in acquiring knowledge on agricultural technology. About 16 per cent of the respondents reported that from such printed materials they have learnt some thing new about the technology of cultivation of paddy and potato and thus enjoyed better yield.

Agricultural problems and use of certain sources of information

The respondents were asked to identify specific problems, which have hampered their agricultural production. All the respondents had encountered with several problems either in their own family farm including kitchen garden or that of others.

Table 6.5 shows that for maximum (35.40 per cent) farmers, attack of pest and disease was the major problem in cultivation of crops. It was followed by inadequate irrigation (29 per cent), land reclamation (15.80 per cent), non availability of inputs (14.20 per cent), and high input cost (5.20 per cent).

Financial problems were mentioned by only 0.40 per cent of the farmers. It has been observed that the extension agents, agricultural development officer, and Krishi Prajukti Sahayak (KPS) had most direct contact with the farmers. So, for redressing the technical problems the farmer had to depend on them. They are the official extension agents for agriculture.

Table 6.5: Percentage Distribution of Respondents by the Principal Problems they Faced in their Agriculture

Type of Problem	Distribution		
	No	Percentage	Rank
1. Pest and disease problem	177	35.40	I
2. Inadequate irrigation	145	29.00	II
3. Problem of land reclamation	079	15.80	III
4. Non-availability of input	071	14.20	IV
5. High input cost	026	05.20	V
6. Financial problem	002	00.40	VI

In the districts under study, along with the formal institutional sources of information, another important and immediate source of knowledge to the farmers was fertilizer dealers. To 59 per cent farmers fertilizer dealers were their main source of information in agricultural matters. Among the respondents 41.40 per cent used to consult with other knowledgeable/ progressive farmers of the village to redress their specific agricultural problems. The progressive farmers had been the important linkmen between the extension workers and the general farmers for mitigating certain agricultural problems and dissemination of new technology. It is therefore necessary for the project management to provide the knowledge of new agricultural technologies to both fertilizer dealers and

progressive farmers through frequent contact with them so that they may further pass on the information to the other farmers.

Some respondents found the messages received from other information sources quite useful in the context of their agriculture. For instance, 28.80 per cent of the farmers competently used the knowledge received from mass media like radio, printed media, farm demonstration etc.; to palliate their certain farm problem.

Access to Krishi Prajukti Sahayak (KPS)

Under the Training and Visit {T&V) system of extension, linkage between the K.P.S. and the farmers has been emphasized to promote and strengthen the diffusion process by means of fortnightly visit of KPS to farmers at their field situation. But in reality that linkage has not achieved the desired pattern as originally envisaged by the extension experts. Field data show that even after several years of operation of T and V system, 48.40 per cent farmers had no clear-cut idea/knowledge about this particular extension system. They even did not know who is the working KPS in their area and what for he has been deputed?

Regarding the frequency of visit by KPS during last one month, it is found that the proportion of farmers who were contacted twice by the KPS was only 3.20 per cent. In the case of single visit the corresponding proportion was 5.40 per cent. This is clear indication of extremely limited access of farmers to KPS. Moreover, when 91.40 per cent of the respondents were identified as totally non-contacted farmers by the KPS during 1995-96, the frequency of visit of KPS to farmers' field was also not at all encouraging. This particular problem needs to be examined seriously and associated organizational and other hindrances against its effective functioning are to be removed.

Table 6.6 : Nature and Extent of contact of KPS with the Farmers according to Frequency, Source, and Place

	Percentage
Frequency of contact	
One to three (Rare)	18.20
Often	13.40
No contact	68.40
Who contacted	
Farmer	72.70
Krishi Prajukti Sahayak	27.20
Place of contact	
Gram Panchayat Office	44.30
Field	33.54
Others Viz. (Agril. Office and village market)	21.15
Purpose of contact	
For technical discussion/advice	90.50
Minikit information	09.49

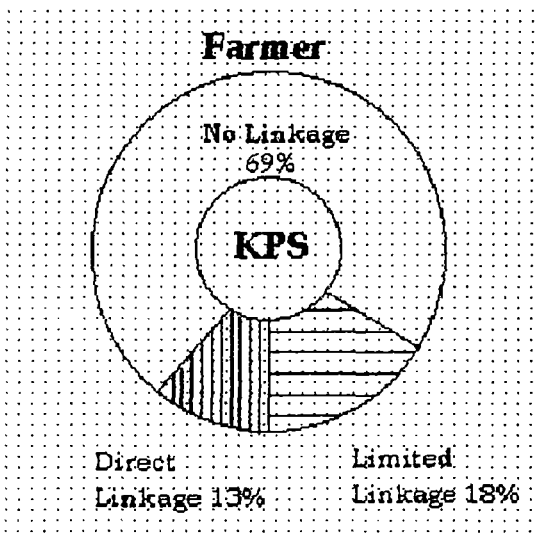
Nature and extent of contact

Radhukar (1962) in his adoption and diffusion study of farm Practices opined that those farmers who had used mass media and institutional sources more frequently and had high contact with extension agents were progressive farmers and opinion leaders who spread innovation to average farmers.

It is clear from Table 6.6 and Fig -2 that the farmers who were contacted fresquently by the KPS in the last one year their proportion was only 13.40 per cent. Due to their nature of contact with the extension agents and agencies those farmers were identified by others as knowledgeable source of information.

During 1995-96, about 18 per cent of farmers were found 'rarely' contacted by the KPS. On the other hand, 68.40 per cent farmers had not been contacted at all by the KPS. That was one of the major weaknesses in the functioning of the ongoing T and V system of extension.

Fig-2. Linkage of contact between KPS and Farmers



On frequency of visit by KPS, about 27 per cent of farmers reported that the KPS had visited them at least once or little more during last one year. While 72.70 per cent farmers said that they on their own personally contacted the KPS for getting necessary information. This indicates that the farmers were somewhat serious and keen to sought the suggestions and advices of KPS on their personal needs.

Table 6.6 shows that for 33.54 per cent of the farmers it is the KPS who contacted them in their agricultural field. Other 44.30 per cent of the farmers reported that KPS met them in the Gram Panchayat Office, and for another 21.15 per cent it was in other public places like agricultural office, and village market etc.

For about 91 per cent of the farmers, their main reason of contacting the KPS was to discuss with him about some technical problems related to

cultivation of certain crops, while another 9.49 per cent contacted KPS only for getting information about allotment of minikit.

Table 6.7: Distribution of Respondents by Nature of Benefits Received from KPS

Nature of Benefit	Percentage of Farmers Received the Benefit
Knowledge about plant protection measures	46.83
Fertilizer and irrigation management	18.35
No benefit from contact	17.08
Minikit information and soil testing	12.02

Table 6.7 depicts that 46.83 per cent of the farmers learnt about the plant protection measures from KPS. Another 18.35 per cent acquired from KPS some technical knowledge pertaining to fertilizer application and irrigation management. About 12 per cent farmers said that they first got the information of soil testing and distribution of minikit from their KPS. However, according to the estimation of 17.08 per cent of farmers their contact with the KPS was not beneficial at all.

Fulfillment of information needs

About the utility of advice and information which is given by KPS, 75.20 per cent of the farmers reported that the technical and other advices offered by the KPS were not adequate enough to fulfil their information need. The remaining 24.80 per cent farmers were however became benefited from various suggestions of the KPS. Among those benefited farmers, for 21.20 per cent of them the extent of benefit was partial where as only 3.60 per cent said that in different agricultural matters and information the KPS helped them a lot.

Utility of Training and Visit System

The farmers were asked to assess the utility of T and V system of extension. In this regard 25.20 per cent farmers claimed that this particular programme appeared to them quite useful and it really helped to improve their farm out put. However, majority (74.80 per cent) of the respondents had a negative opinion about the utility of the T and V programme in its present form. It has been admitted by agricultural development personnel that the administrative set-up in which extension agents work keep them away from making frequent close contact with the farmers. The extension agents are expected to spend a lot of hours on paper works and other official activities not immediately related to actual extension services. What were the underlying reasons against negative estimation of T and V system? The respondents were asked to identify the prime reasons that why they are apathetic to the T and V system and do not found it as an effective programme. Table 6.8 records some of such specific reasons put forward by the farmers.

Table 6.8: Reasons for Developing Negative Attitude towards T & V System

Reason	Score in percentage
Poor contact	40.90
No advice from KPS	30.74
Lack of training facility	14.43
Poor competency of village level extension worker	06.14
No response	07.75

About 41 per cent of the respondents felt poor or irregular contact of village level extension functionaries called KPS with the farmers was the main weakness of the programme. About 31 per cent complained that farmers did not get necessary advice from KPS in times of any crisis or need. Another six per cent of respondents directly questioned the very competence of KPS i.e. village level

extension workers. On the other hand 14.43 per cent of the farmers alleged the lack of training facilities available to the cultivators.

Against the backdrop of the feed back received from the farmers and to make the Training and Visit system as an effective means of extension, the functioning of grass root level extension workers (KPS) needs to be streamlined in terms of their frequency of contact, competence to furnish up to date information and timely delivery of needed services to the farmers. It is believed by many respondents that if proper attention is paid to remove the existing shortcomings of the T and V system, the programme can yield better results.

Attitude, Knowledge and adoption behaviour

Attitude has been defined by Allport (1935) as a mental and / or natural state of readiness, organized through experiences exerting a directive and dynamic influence upon the individual's response to all objects and situations with which he is related. From a study of the attitude towards T and V system in the command area of Rajasthan, Kulhari (1980) pointed out that the attitude scores of the progressive farmers were higher than those of non-progressive farmers. Several studies conducted in India and abroad have established the relationship between attitude of farmers and the adoption of improved practices.

Attitude towards Training and Visit System

The Training and Visit system is the latest and largest extension programme. It has been implemented throughout the country to boost up agricultural production. The attitude of the farmers towards this extension system is a reflection of the intimacy and understanding between the so-called communicator and the target population. Thus the attitude of the respondents towards the T and V programme is necessary to examine.

In the present enquiry majority (69.80 per cent) of the farmers showed some kind of favourable attitude towards this particular system of extension. That is a positive sign to make the T and V system of extension as an effective

and well accepted programme. A sizeable proportion (28.40 per cent) of the respondents was however somewhat skeptic or indifferent towards this particular system of agricultural extension.

Knowledge of farmers about agricultural innovations

The knowledge about scientific cultivation is a prerequisite for its adoption. In order to assess the knowledge level of farmers with regard to modern agricultural technology involved in cultivation, a standardized knowledge test based on the 'teacher made style' was developed. The items included in the questionnaire are given in Table 6.9. Each question carries single score.

Table 6.9: Technological Items Selected for Knowledge test by Recording Right Choice

Serial No.	Specific question
1.	Sonalika is a variety of a) Wheat b) Paddy c) Jute d) Maize
2.	Dhaincha is a a) green manuring crop b) Pulse crop c) oilseed crop
3.	Pulse crop adds mainly --- in the soil a) N_2 b) P_2O_5 c) K_2O
4.	S.S.P. Should be used in paddy during a) Flowering b) Final land preparation c) Tillering
5.	N_2 percentage in Urea is a) 56% b) 36% c) 46%
6.	Dithane M-45 is a) Insecticide b) Fungicide c) Micro-nutrient
7.	*Bhepu-poka* is a pest of a) Rice b) Wheat C) Tomato
8.	IET-1444 (Rasi) is variety of a) Rice b) Wheat c) Tomato d) Brinjal

Several items selected for the knowledge test in cultivation were considered as per their importance and contribution towards productivity in consultation with senior personnel of agriculture department. It was ensured

that there was no imbalance in selection of items. On a possible range of knowledge score from 0 to 8, 227 (45.40%) received a low score of 1 - 4, 240 (48.00%) a medium score of 4 - 6, and 33 (6.60%) received a high score of above 6. The average knowledge score of the respondent farmers was 4.2, that is, in the medium range.

Table 6.10: Distribution of Farmers by their Knowledge Score

Knowledge Score	Distribution	
	No.	Per cent
Upto 30 per cent (Low)	227	45.40
40-60 per cent (Average)	240	48.00
Above 60 per cent (High)	033	06.60

Table 6.10 shows that the knowledge score of farmers ranges between 30 per cent or below and up to 60 per cent and above. Greater proportion (48 per cent) of the farmers had average and 45.40 per cent had lower level of knowledge. On the other hand 6.60 per cent of the farmers recorded a high level of knowledge on scientific agricultural practices. Thus it is evident that despite economic backwardness and poor literacy situation in the villages under study about 55 per cent of the respondents had high and medium level of knowledge about certain new agricultural technologies.

Adoption behaviour towards recommended practices: The case of paddy

Almost all the farmers of the Jalpaiguri and Cooch-Behar districts cultivate paddy which is also a principal crop in North Bengal region. Adoption behaviour with particular reference to paddy has therefore been taken into prime consideration.

Table 6.11 : Knowledge and Adoption Scores of Certain Technologies by Source of Knowledge (Distribution in percentage)

Sl No.	Type of Technology	Knowledge	Adoption	Source of Knowledge			
				Farmer	Fertilizer dealer	K.P.S.	Other Sources
1.	Improved seed	100.00	100.00	83.80	13.60	01.60	01.00
2.	Application of plant nutrient	97.20	97.20	65.84	30.45	01.23	02.46
3.	Time Schedule of N.P.K	86.00	86.00	20.60	67.28	06.49	05.56
4.	P.P. measures	70.40	69.80	09.09	67.32	18.75	04.82
5.	Farm implements	52.40	47.20	84.35	12.97	00.76	01.90
6.	Seed treatment	23.40	22.22	22.22	49.50	17.90	10.25
7.	Preparatory tillage	99.40	99.40	96.78	03.01	00	00.20
8.	Irrigation management	27.80	27.80	85.61	00.71	06.47	07.19
9.	Better storing method	00.20	00.20	00	00	100.00	00
10.	Soil reclamation	19.20	07.80	13.54	32.29	41.66	12.50
11.	Improved cattle	04.60	04.20	95.65	00	00	04.34

Table 6.12: Adoption Profile of Recommended Practices for Paddy

Number of Recommended Technology	No of Farmers Adopted
Farmers adopting One recommended technology	002
Farmers adopting Two recommended technology	012
Farmers adopting Three recommended technology	046
Farmers adopting Four recommended technology	065
Farmers adopting Five recommended technology	117
Farmers adopting Six recommended technology	119
Farmers adopting Seven recommended technology	063
Farmers adopting Eight recommended technology	046
Farmers adopting Nine recommended technology	025
Farmers adopting Ten recommended technology	005
Farmers adopting more than Ten recommended technology	000

In order to get a good outturn of paddy the farmers have adopted several recommended practices at varying scales. Details of the practices recommended for paddy cultivation in the study districts are given in Table 6.11. Here the practices and types of technology recommended refer to good quality of seed, timely application of balanced dose of plant nutrients, application of water at different growth stages. The control of pest and disease, seed treatment and application of pesticides are identified as another set of recommendation .Use of modern implements and improved cattle as farm power are required for ensuring better agricultural operations. Soil reclamation is also essential for improving soil condition and better storing method is required to maintain the viability of seed. The aforesaid practices involved in the cultivation of paddy were taken into consideration owing to their importance and contribution towards better productivity in consultation with senior agricultural personnel of

the concerned department. Let us look into the actual situation of adoption of recommended practices as observed in the case of paddy.

Table 6.12 shows the number of recommended practices adopted by the farmers in a range of one to ten. It has been observed that the farmers who have used one to four practices their proportion was 25 per cent and thus belong to the category of 'low adopters'. Another 60 per cent of the respondents who have adopted 5 to 7 recommended practices may be called as 'medium adopters'. And there were 15 per cent of farmers in the category of ' better adopters' who have found embraced more than seven practices.

Adoption behaviour

Some farmers often avoid adopting certain recommended practices for paddy. So there was an attempt in the study to find out the practices which were not or poorly adopted by the farmers as well as the underlying reasons against such non adoption. The data on the aspect of knowledge and adoption have been presented in Table 6.11. It has been observed that out of 11 recommended practices for cultivation of paddy, six were poorly adopted by the farmers. So about 55 per cent of the recommended items were either non adopted or scarcely adopted. By item those specific practices were, use of improved farm implements, seed treatment, irrigation management, better storing method, soil reclamation and use of improved cattle. The main reason behind low or non-adoption of those practices was farmer's incomplete and improper knowledge about the same. This apart, the cost involved in adopting certain practices was another hindrance. The extension and other associated institutional strategies therefore need to be re-oriented to remove those hindrances. Table 6.11 reveals that H.Y.V. paddy seed was used by all the farmers. Awareness score of participant farmers about application of plant nutrient was quite high (97.20 per cent) and equal to the adoption score. More than 97 per cent of the farmers knew

about the preparatory tillage like deep and increased number of ploughing and adopted the same to a great extent.

Irrespective of their socio-economic status, 86 per cent of the farmers had the knowledge about the time schedule for applying Nitrogenous-Phosphatic and Potassic (NPK) fertilizer. They also found adhere to follow such a schedule. More than 70 per cent farmers knew and applied various pest and disease control measures in their agriculture. The reason for non-adoption of plant protection measures as identified in some cases was the high costs of pesticides and fungicides. The knowledge score about the use of improved farm implements in paddy cultivation was 52.40 per cent whereas its adoption score was 47.20 per cent only. The farmers were unable to use many improved tools in their agriculture due to their inability to afford such costly implements personally.

The extent of knowledge and rate of adoption of other recommendations or practices such as seed treatment, irrigation management, better storing method, soil reclamation, and use of improved cattle was not at all satisfactory. The adoption scores against seed treatment, irrigation management and soil reclamation were 22.22 per cent, 27.80 per cent and 7.80 per cent respectively. Poor knowledgeability about those practices may be accounted for their low adoption. That deserves special attention for further improvement. It is evident from Table 6.11 that 19.20 per cent of the farmers were aware about the merit of soil reclamation whereas only 7.80 per cent actually took the advantage of the report of soil testing and adopted follow-up measures. Amongst the farmers, who denied soil testing more than 65 per cent of them told that there was no soil testing arrangement in their reach, and another 35 per cent alleged that even when they opted for the same the soil testing report was not available to them.

Adoption score of the recommended practices related to better storing methods and the use of improved cattle was very low. It was only 0.20 per cent

and 4.20 per cent respectively. Here also the insufficient knowledge about scientific storing methods and high cost involvement in purchasing improved cattle were the major constraints against responding favourably towards recommended practices. The overall awareness and adoption score of the farmers in paddy cultivation was 52.60 per cent and 51.07 per cent respectively (see Table 6.11). The findings therefore suggest to take appropriate measures in improving the rate of adoption.

New technology and the Sources of information used

Details of the practices recommended for paddy cultivation along with the sources of information of respondent farmers in the two study districts are given in Table 6.11. In respect of adoption of different recommended practices the farmers availed necessary information from different sources. To mention in particular, those sources of information were the knowledgeable and progressive farmers within and outside the village, fertilizer dealers, KPSs and other sources like mass media, sales men of fertilizer and pesticide companies. For instance, in the case of scientific treatment of paddy the rate of use of specific information sources in terms of percentage was as follows: progressive farmer 52.49; Fertilizer dealer25.18; Krishi Prajukti Sahayak [KPS] 17.71; and other sources 4.56.

Progressive farmers were the most important source of information and knowledge to 52.49 per cent of the respondents. On the other hand, 13.40 per cent farmers claimed that they had frequent contact with the extension agency. It was also a good source of information to the general farmers. Information often flows at inter personal level from contact farmers to others living in the same areas . Thus the common farmers obtained most of their information from progressive, and/or contact farmers through face-to-face and word-of-mouth communication.

Fertilizer dealers were another important source of information to the farmers. In paddy cultivation, 25.18 per cent of them relied on fertilizer dealers for necessary knowledge and information. It is interesting to note that for knowledge about complex farming methods and techniques like plant protection measures, time schedule of NPK and seed treatment, the farmers were more dependent on fertilizer dealers. For certain specific practices like scheduling of fertilizer application and for diagnosis of pest and disease about 50 per cent and more farmers identified fertilizer dealers as their first hand source of knowledge and information. This is to note that the fertilizer and pesticide sellers and dealers used to update their knowledge and had direct contact with extension agents for the interest of their business. The farmers had easy access to those dealers and the latter being the supplier of farm inputs and knowledge were quite conscious to achieve certain trust and confidence among the farmers.

The present personal contact agent between the extension system and the farmer is the Krishi Prajukti Sahayak (KPS). It is important to note that only about 18 per cent farmers relied on the advice of KPS in various matters of their agriculture. Needless to say, KPS was hardly easily available to them in their needs. The findings of earlier discussion also reveal that some farmers were somewhat serious and keen to get the suggestions and advices from the KPS as and when necessary. The general farmers had an expectation to regularly receive information from the KPS. But in reality it was not feasible for a KPS to provide regular visit to the field of every farmer as he was liable to cover large number of farm families periodically in addition to his routine office works. Therefore on the part of the project management there is a need to evolve appropriate strategies which may facilitate and ensure regular visit of KPS to a large number of farmers as possible.

The use of 'other sources' of information like mass media, etc., by the farmers was found to be less significant. Only 4.56 per cent of farmers received

and utilised the relevant messages of the same in their paddy cultivation. The use of the mass media as a source of agricultural information was negligible because of low level of literacy, one way of communication and hard technical presentation of messages.

As a source of information the personal channels received much importance and preference from the cultivators than the impersonal channels. Among the personal sources, so-called knowledgeable farmers were ranked high by the farmers as their immediate source of information. The extension agents like KPS had more or less regular contact with those knowledgeable farmers and vice-versa. The role of those knowledgeable farmers as local communicator in disseminating new agricultural messages thus become important.

Association between selected characteristics of farmers and their adoption behaviour

Some important personal variables are likely to influence the farmer's adoption behaviour relating to new technology. To put it in other way, it was assumed that a farmer's adoption behaviour will be dependent on some of his personal background like age, education, land holding, social status, attitude, knowledge and exposure to extension. The findings on association between adoption level of farmers and their personal background have been presented in Table 6.13. In explaining the situation there was a need to apply the chi-square test and where we used χ^2 test for the necessary statistical inference. But in the cases where the validity of the application of χ^2 did not exist, we calculated co-efficient of correlation from the bivariate table and then went for t-test. The actual results are discussed below.

Age

Table 6.13 indicates that Chi-Square value of 4.11 was not significant at 1 per cent and 5 per cent level. Thus it can be said that there was no relation

between the age and adoption of farmers, and the two attributes were quite independent.

Table 6.13 further shows that 325 (65 per cent) respondents were in the age group of 45 years and below, of which 54.40 per cent were in the category of 30 to 45 years and who had different adoption level. Out of 272 respondents belonging to the age group of 30 - 45 years, 59.21 per cent had higher and 52.84 per cent had medium level of adoption of recommended practices of paddy. Out of the 175 respondents belonging to the age group above 45 years, 28.94 per cent and 35.11 per cent had higher and medium level of adoption respectively. Only 38.40 per cent respondents of that particular age group showed lower level of adoption .

Education

Table 6.13 reveals that 19.60 per cent farmers were illiterate, 22.20 per cent were educated upto primary level and 49.80 per cent and 8.40 per cent had education upto secondary and above secondary levels respectively. It also appears from Table 6.13 that in respect of adoption of improved practices for paddy cultivation the value of correlation coefficient was 0.36(see Table 6.14), so there was a significant correlation between adoption behaviour and education. Educated farmers were more inclined to apply/ use better technologies than the farmers with low level of education.

Positive correlation between the adoption of various crop technologies and level of education of the farmers as observed in the case of present study (see Table 6.14) comes similar to the findings of Saini (1983), Wilson and Gallup (1953), and Tyagi and Sohal (1984). It is perhaps education, which enables farmers to use the print media for information on agricultural innovations, store them for future use and retrieve them when needed. The second most important reason is perhaps, education helps expanding the horizon of knowledge, awareness, outlook and consciousness that enable farmers to judge pragmatically the merits or demerits of technological innovations.

Landholding

By landownership status 48.20 per cent of the farmers were in the category of 'marginal farmers' and who had cultivated land less than one Hectare. The proportion of 'medium' (above 2 Hectares but less than 4 Hectares) and 'small' farmers (1 to 2 Ha.) was 12.80 per cent and 36.60 per cent respectively. Only 2.40 per cent farmers were 'large' farmers and owning land above 4 Hectares. The correlation between landholding and level of adoption is found positive both at 5 per cent and 1 per cent probability level(see Table 6.15). It strongly confirms the association between farmers land holding status and their adoption behaviour. In the case of adoption of recommended or new technologies in paddy cultivation size of farm i.e. landholding had the r-value of 0.33. The results further confirm the validity of the fact that big/large farmers normally make greater use of better seeds, fertilizers, pesticides and insecticides than the other classes of farmers. As compared to the big farmers the marginal and small landowners cannot often invest much on plant protection measures, machines and other costly inputs because of certain financial limitations. Many of them thus keep them selves away from modern practices or adopt those partially.

Attitude towards Training and Visit System

Table 6.13 depicts that on the whole 69.80 per cent farmers had favourable and 1.80 per cent strongly favourable attitude towards T and V system of extension. On the other hand, 28.40 per cent farmers were found somewhat indifferent and had no opinion about this particular extension system. But the association between attitude towards T and V system and level of adoption was positive and significant at 5 per cent and 1 per cent level. The degree of said correlation in the case of adoption of improved paddy cultivation was 0.50 (see Table 6.16). The two variables were thus strongly related. It also corroborates with the findings of Kulhari (1980), and Tyagi and Sohal (1984). That implies, those who had a favourable attitude towards the T and V system of extension

had a better adoption level. It shows the positive impact of the T and V system on diffusion and adoption of technological innovations.

Socio-economic status

In the districts under study 51.80 per cent respondents were belonging to the category of lower socio-economic status and about 38 per cent and 10.20 per cent in the medium and high socio-economic status groups respectively. The correlation coefficient between socio-economic status and level of adoption of new technology is found to be positively significant both at 5 per cent and 1 per cent level. Correlation between adoption of improved practices for paddy and socio-economic status shows that the farmers with better living and economic conditions normally used better technologies in respect to choice of seeds, use of fertilizer, pesticides etc. In the case of paddy, the value of correlation coefficient was fairly high (0.51), which denotes farmers of better socio-economic status utilised more recommended practices and had better adoption potentialities than the others(see Table 6.17).

Extension contact

It is clear from Table 6.13 that 68.40 per cent of the farmers had no contact with the village level extension agents. However, 18.20 per cent and 13.40 per cent farmers had 'rare' and 'often' contact respectively with such agents. The association between farmers' extension contact and their adoption behaviour is found highly intimate. That positive correlation (Table 6.18) perhaps indicates, the farmers who were contacted regularly by the extension workers had adopted the improved cultivation practices to a great extent. Thus it is needless to say, the T and V system has certainly helped in improving the level of adoption of the farmers in varying degrees.

Knowledge about agricultural technology

Table 6.13 shows that 48 per cent and 45 per cent farmers had 'medium' and 'lower' level of knowledge about agricultural technology respectively. The

Table 6.13 Association of Selected Characteristics of the Farmers with the Levels of Adpotion

Characteristics	Adoption			Total	Value of Chi-square
	High	Medium	Low		
Age					
i) Young (below 30 Years)	09 (11.84)	36 (12.04)	08(06.40)	53 (10.60)	04.11
ii) Adult (32 to 45 Years)	45 (59.21)	158 (52.84)	69(55.20)	272 (54.40)	(Non –significant)
iii) Old (above 45 Years)	22 (28.94)	105 (35.11)	48(38.40)	175 (35.00)	
Education					
i) Illiterate	03 (03.94)	49 (16.38)	46 (36.80)	98 (19.60)	
ii) Primary	09 (11.84)	64 (21.40)	38 (30.40)	111(22.20)	
iii) Secondary	49 (64.47)	163 (54.51)	37 (29.60)	249 (49.80)	
iv) Above Secondary	15 (19.73)	23 (07.69)	04 (03.20)	42 (08.40)	
Land Holding					
i) Marginal (less than 1 Ha)	16 (21.05)	137 (45.81)	88 (70.40)	241 (48.20)	
ii) Small (1-2 Ha)	34 (44.73)	123 (41.13)	26 (20.80)	183 (36.60)	
iii) Medium (greater than 2 Ha & less than 4 Ha)	18 (23.68)	37 (12.37)	09 (07.20)	64 (12.80)	
iv) Large (greater than 4 Ha)	08 (10.52)	02 (00.66)	02 (01.60)	12 (02.40)	
Attitude					
i) Strongly favourable	05 (06.57)	04 (01.33)	00 (00.00)	09 (01.80)	
ii) Favourable	66 (86.84)	242 (80.93)	41 (32.80)	349 (69.80)	
iii) No response	05 (06.57)	53 (17.72)	84 (67.20)	142 (28.40)	
Socio-economic Status					
i) Low (upto Rs. 15,000)	09 (11.84)	144 (48.16)	106(84.80)	259 (51.80)	
ii) Medium (Rs. 15-40,000)	39 (51.31)	133 (44.40)	18(14.40)	190 (38.00)	
iii) High (above 40,000)	28 (36.84)	22 (07.35)	01(00.80)	051 (10.20)	
Extension Contact					
i) No contact	06 (07.80)	220 (73.57)	116(92.80)	342 (68.40)	
ii) Rare	29 (38.15)	55 (18.39)	07(05.60)	91 (18.20)	
iii) Often	41 (53.90)	24 (08.02)	02(01.60)	67 (13.40)	

Contd.....

Characteristics	Adoption			Total	Value of Chi-square
	High	Medium	Low		
Knowledge about agril. technology					
i) Low	03 (03.94)	116 (38.79)	108 (86.40)	227 (45.40)	
ii) Medium	46 (60.52)	177 (59.19)	17 (13.60)	240 (48.00)	
iii) High	27 (35.52)	06 (2.006)	00 (00.00)	33 (06.60)	

(Figures in parenthesis indicate percentage to the total)

Where d.f. = 4 Value of $\chi^2 = 9.49$ at 5% level and Value of $\chi^2 = 13.28$ at 1% level (Tabulated)

farmers who had higher level of such knowledge their proportion was only 6.60 per cent. The correlation coefficient between knowledge and level of adoption was highly significant (r = 0.59) and there was positive association between the two (Table 6.19). Thus it appears the farmers with high level of knowledge were more receptive to the new ideas and practices, and in a better way adopted those relatively earlier than the others.

It is evident from the preceding discussion that current Training and Visit system has been able to influence the farmers to a limited scale by providing them information about farm problems and also offering feed backs to the extension workers. The T & V system intends to deliver the knowledge of updated technology to the target population. Some of the potential adopters (including small and marginal farmers) of new technologies were exposed to this new information system. In the arena of new agricultural technology the impact of the T&V extension system is slow but progressive. Majority of the respondents in two study districts farmers had a favourable attitude towards this extension system and felt that farmers could acquire up to date and necessary scientific knowledge of cultivation from it. They thus asked to remove all the existing shortcomings in the functioning of this system.

Table 6.14 : Table showing Relationship between Education of the Farmers and their Level of Adoption

Adoption u / Education v		High	Medium	Low	Total f(v)	vf(v)	$v^2f(v)$	$\Sigma uvf(uv)$
		3	2	1				
		Code Score						
Illiterate	0	0 3	0 49	0 46	98	0	0	0
Primary	1	3 9	2 64	1 38	111	111	111	193
Secondary	2	6 49	4 163	2 37	249	498	996	1020
Above Secondary	3	9 15	6 23	3 4	42	126	378	285
Total f(u)		76	299	125	500	735	1485	1498
uf(u)		228	598	125	951			
$u^2f(u)$		684	1196	125	2005			
$\Sigma uvf(uv)$		456	918	124	1498			

r = 0.36 Significant at 0.01 level and .05 level of probability**

Computation of co-efficient of correlation from the bivariate Table 6.14

Here, u denotes attribute 'Adoption'

v denotes attribute 'Education'

$$\bar{u} = \frac{\sum uf(u)}{N} = \frac{951}{500} = 1.90$$

$$\bar{v} = \frac{\sum vf(v)}{N} = \frac{735}{500} = 1.47$$

$$\sigma\bar{u}^2 = \frac{\sum u^2 f(u)}{N} - \bar{u}^2 = \frac{2005}{500} - (1.90)^2 = (0.63)^2$$

$$\sigma\bar{v}^2 = \frac{\sum v^2 f(v)}{N} - \bar{v}^2 = \frac{1485}{500} - (1.47)^2 = (0.89)^2$$

$$\text{cov(u,v)} = \frac{1498}{500} - 1.90 \, x 1.47 = 0.203$$

$$r = \frac{0.203}{0.63 \, x \, 0.89} = 0.36$$

By using student's *t-test* where $H_0(\rho = 0)$ against

$$H_1(\rho \neq 0)$$

$$t = \frac{r - 0}{\sqrt{1 - r^2}} x \sqrt{N - 2}$$

= 8.63** (Significant)

Table $t_{498,0.05} = 1.96$

$t_{498,0.01} = 2.58$

Table 6.15 : Table showing Relationship between Land holding of the Farmers and their Level of Adoption

Adoption u / Land holding v		High	Med-ium	Low	Total f(v)	vf(v)	$v^2f(v)$	$\Sigma uvf(uv)$
		3	2	1				
		Code Score						
Marginal	1	3 16	2 137	1 88	241	241	241	410
Small	2	6 34	4 123	2 26	183	366	732	748
Medium	3	9 18	6 37	3 9	64	192	576	411
Large	4	12 8	8 2	4 2	12	48	192	120
Total f(u)		76	299	125	500	847	1741	1689
uf(u)		228	598	125	951			
$u^2f(u)$		684	1196	125	2005			
$\Sigma uvf(uv)$		510	1004	175	1689			

r = 0.33 ** Significant at 0.01 level and .05 level of Probability

Computation of co-efficient of correlation from the bivariate Table 6.15

Here, u denotes attribute 'Adoption'

v denotes attribute 'Land holding'

$$\bar{u} = \frac{\sum uf(u)}{N} = \frac{951}{500} = 1.90$$

$$\bar{v} = \frac{\sum vf(v)}{N} = \frac{847}{500} = 1.69$$

$$\sigma\bar{u}^2 = \frac{\sum u^2 f(u)}{N} - \bar{u}^2 = \frac{2005}{500} - (1.90)^2 = (0.63)^2$$

$$\sigma\bar{v}^2 = \frac{\sum v^2 f(v)}{N} - \bar{v}^2 = \frac{1741}{500} - (1.69)^2 = 0.62 = (0.79)^2$$

$$\text{cov}(u,v) = \frac{\sum uvf(u,v)}{N} - \bar{u}\bar{v} = \frac{1689}{500} - 1.90 \times 1.69 = 0.167$$

$$r = \frac{\text{cov}(u,v)}{\rho u \rho v} = \frac{0.167}{0.63 \times 0.79} = 0.33$$

By using student's *t-test* for test of Significance where $H_0(\rho = 0)$ against $H_1(\rho \neq 0)$

$$t = \frac{r - 0}{\sqrt{1 - r^2}} \times \sqrt{N - 2}$$

= 7.83** (Significant)

Table $t_{498,0.05} = 1.96$

$t_{498,0.01} = 2.58$

Table 6.16 : Table showing Relationship between Attitude of the Farmers towards T and V system and their Level of Adoption

Adoption u / Attitude v		High	Med-ium	Low	Total f(v)	vf(v)	$v^2f(v)$	$\Sigma uvf(uv)$
		3	2	1				
		Code Score						
Strongly Favourable	2	6 5	4 4	2 0	9	18	36	46
Favourable	1	3 66	2 242	1 41	349	349	349	723
Noresponse	0	0 05	2 53	0 84	142	0	0	0
Total f(u)		76	299	125	500	367	385	769
uf(u)		228	598	125	1049			
$u^2f(u)$		684	1196	125	2005			
$\Sigma uvf(uv)$		228	500	41	769			

r = 0.50 ** Significant at 0.01 level and .05 level of probability

Computation of co-efficient of correlation from the bivariate Table 6.16

Here, u denotes attribute 'Adoption'

v denotes attribute 'Attitude'

$$\bar{u} = \frac{\sum uf(u)}{N} = 1.90$$

$$\bar{v} = \frac{\sum vf(v)}{N} = 0.73$$

$$\sigma\bar{u}^2 = \frac{\sum u^2 f(u)}{N} - \bar{u}^2 = \frac{2005}{500} - (1.90)^2 = (0.63)^2$$

$$\sigma\bar{v}^2 = \frac{\sum v^2 f(v)}{N} - \bar{v}^2 = \frac{385}{500} - (0.73)^2 = (0.48)^2$$

$$\text{cov}(u,v) = \frac{\sum uvf(u,v)}{N} - \bar{u}\bar{v} = 0.15$$

$$r = \frac{\text{cov}(u,v)}{\rho u \rho v} = 0.50$$

By using student's *t-test* for test of Significance where

Null hypothesis H_0: (there is no relationship between adoption and attitude)

against

Alternative hypothesis H_1: (there exists relationship between adoption and attitude)

$$t = \frac{r - 0}{\sqrt{1 - r^2}} x \sqrt{N - 2}$$

= 12.97** (Significant)

Table $t_{498,0.05} = 1.96$

$t_{498,0.01} = 2.58$

Table 6.17 : Table showing Relationship between Socio-economic status of the Farmers and their Level of Adoption

Adoption u / Socio economic status v		High	Med-ium	Low	Total f(v)	vf(v)	$v^2f(v)$	$\Sigma uvf(uv)$
		3	2	1				
		Code Score						
Low	1	3 9	2 144	1 106	259	259	259	421
Medium	2	6 39	4 133	2 18	190	380	760	802
High	3	9 28	6 22	3 1	51	153	459	387
Total f(u)		76	299	125	500	792	1478	1610
uf(u)		228	598	125	951			
$u^2f(u)$		684	1196	125	2005			
$\Sigma uvf(uv)$		513	952	145	1610			

r = 0.51 ** Significant at 0.01 level and .05 level of probability

Computation of co-efficient of correlation from the bivariate Table 6.17

Here, u denotes attribute 'Adoption'

v denotes attribute 'Socio-economic status'

$$\bar{u} = \frac{\sum uf(u)}{N} = \frac{951}{500} = 1.90$$

$$\bar{v} = \frac{\sum vf(v)}{N} = \frac{792}{500} = 1.58$$

$$\sigma\bar{u}^2 = \frac{\sum u^2 f(u)}{N} - \bar{u}^2 = \frac{2005}{500} - (1.90)^2 = (0.63)^2$$

$$\sigma\bar{v}^2 = \frac{\sum v^2 f(v)}{N} - \bar{v}^2 = \frac{1478}{500} - (1.58)^2 = (0.67)^2$$

$$\text{cov(u,v)} = \frac{\sum uvf(u,v)}{N} - \bar{u}\bar{v} = \frac{1610}{500} - 1.90 \, x 1.58 = 0.218$$

$$r = \frac{\text{cov}(u,v)}{\rho u \rho v} = \frac{0.218}{0.63 \, x \, 0.67} = 0.51$$

By using student's *t-test* where $H_0(\rho = 0)$ against

$$H_1(\rho \neq 0)$$

$$t = \frac{r - 0}{\sqrt{1 - r^2}} x \sqrt{N - 2}$$

=13.54** (Significant)

Table $t_{498,0.05} = 1.96$

$t_{498,0.01} = 2.58$

Table 6.18 : Table showing Relationship between Extension Contact of the Farmers and their Level of Adoption

Adoption u / Extension Contact v		High	Medium	Low	Total f(v)	vf(v)	$v^2f(v)$	$\Sigma uvf(uv)$
		3	2	1				
		Code Score						
Often	2	6	4	2	67	134	268	346
		41	24	2				
Rare	1	3	2	1	91	91	91	204
		29	55	7				
No contact	0	0	0	0	342	0	0	0
		6	220	116				
Total f(u)		76	299	125	500	225	359	550
uf(u)		228	598	125	951			
$u^2f(u)$		684	1196	125	2005			
$\Sigma uvf(uv)$		333	206	11	550			

r = 0.56 ** Significant at 0.01 level and .05 level of probability

Computation of co-efficient of correlation from the bivariate Table 6.18

Here, u denotes attribute 'Adoption'

v denotes attribute 'Extension Contact'

$$\bar{u} = \frac{\sum uf(u)}{N} = \frac{951}{500} = 1.90$$

$$\bar{v} = \frac{\sum vf(v)}{N} = \frac{225}{500} = 0.45$$

$$\sigma\bar{u}^2 = \frac{\sum u^2 f(u)}{N} - \bar{u}^2 = \frac{2005}{500} - (1.90)^2 = (0.63)^2$$

$$\sigma\bar{v}^2 = \frac{\sum v^2 f(v)}{N} - \bar{v}^2 = \frac{359}{500} - (0.45)^2 = (0.71)^2$$

$$\text{cov(u,v)} = \frac{\sum uvf(u,v)}{N} - \bar{u}\bar{v} = 0.25$$

$$r = \frac{\text{cov}(u,v)}{\rho u \rho v} = 0.56$$

By using student's *t-test* where $H_0(\rho = 0)$ against

$$H_1(\rho \neq 0)$$

$$t = \frac{r - 0}{\sqrt{1 - r^2}} x \sqrt{N - 2}$$

= 15.05** (Significant)

Table $t_{498,0.05} = 1.96$

$t_{498,0.01} = 2.58$

Table 6.19 : Table showing Relationship between Knowledge of the Farmers about Agricultural Technology and their Level of Adoption

Adoption u / Knowledge v		High	Med-ium	Low	Total f(v)	vf(v)	$v^2f(v)$	Σuvf(uv)
		3	2	1				
		Code Score						
High	3	9 27	6 6	3 0	33	99	297	279
Medium	2	6 46	4 177	2 17	240	480	960	1018
Lower	1	3 3	2 116	1 108	227	227	227	349
Total f(u)		76	299	125	500	806	1484	1646
uf(u)		228	598	125	951			
$u^2f(u)$		684	1196	125	2005			
Σuvf(uv)		528	976	142	1646			

r = 0.59 ** Significant at 0.01 level and 0.05 level of probability

Computation of co-efficient of correlation from the bivariate Table 6.19

Here, u denotes attribute 'Adoption'

v denotes attribute Knowledge'

$$\bar{u} = \frac{\sum uf(u)}{N} = \frac{951}{500} = 1.90$$

$$\bar{v} = \frac{\sum vf(v)}{N} = \frac{806}{500} = 1.61$$

$$\sigma\bar{u}^2 = \frac{\sum u^2 f(u)}{N} - \bar{u}^2 = \frac{2005}{500} - (1.90)^2 = (0.63)^2$$

$$\sigma\bar{v}^2 = \frac{\sum v^2 f(v)}{N} - \bar{v}^2 = \frac{1484}{500} - (1.61)^2 = (0.61)^2$$

$$\text{cov(u,v)} = \frac{\sum uvf(u,v)}{N} - \bar{u}\bar{v} = \frac{1646}{500} - 1.90 \, x 1.61 = 0.23$$

$$r = \frac{\text{cov}(u,v)}{\rho u \rho v} = 0.59$$

By using student's *t-test* where $H_0(\rho = 0)$ against

$$H_1(\rho \neq 0)$$

$$t = \frac{r - 0}{\sqrt{1 - r^2}} x \sqrt{N - 2}$$

= 16.45** (Significant)

Table $t_{498,0.05} = 1.96$

$t_{498,0.01} = 2.58$