

FARMER'S RESPONSE ON INFORMATION USAGE

In this chapter the results of the study are presented and discussed in detail to address the first objective of the research (to identify sources of information for effective decision making in various sub sectors of agribusiness). With the advent of green revolution the scenario of Indian agriculture has been changed towards more informed agriculture. It is assumed that the latest modern technologies are not effectively transferred to end users. To utilize the modern agricultural techniques different modes of information delivery tools were introduced to bring information deficit agriculture into information rich. Moreover several NGOs, public, cooperatives and private sectors initiated innovative methods towards dissemination of information and knowledge to facilitate farmers in making their agriculture decisions more effective such as by individual, group and mass media way of providing information. The importance of different sources of information could not be neglected.

This chapter thoroughly discusses the socio-demographic profile of users and non-users of information delivery models, their overall profile of sources of information in agribusiness/agriculture decision making, farmer's preferences of sources of information and the quality of information regarding the specific information sources in various stages of agriculture decision making process. The results have been drawn using descriptive statistical tools such as mean, percentage and standard deviation.

7.1 Profile of Users and Non-Users of Models

Table 7.1 provides a summary profile of respondent farmers. The user and non user group is categorized in respect of gender, marital status, age group, education, social category, income/occupation sources and land holdings size. Of the 290 respondents 145 were from both users of ICT model and non users of ICT model for agricultural decision making and 145 were from the non user group. Most of the respondents belong to male category as it seems from Table 7.1 that out of the total sample of 290, 92% were the male respondents.

Further on analyzing the user and non-user group, the male respondents correspond to 92% from the user group and 91% from non user group. The reason for male dominated response may be that the family system in India is patriarchal and mainly the male members of family are information providers on various issues. The male and female groups showed no significant difference as depicted in Table 7.1 ($\chi^2 = 0.182, p = 0.67$).

Goodwin and Kastens (1996) found farmer's age to be a good indicator of farming experience. In this study majority of the respondents were in age group of 25 to 50 years as in the case of user group it counts to 108 out of 145 and in the case of non-user group 109 farmers were in the age group of 25-50 years out of 145 samples. It indicates the involvement of mature group in farming activities. However the user group farmers were more experienced in farming with an average age of 39 years as compared to non-user group who stand at 36 years. The chi-square statistics showed no significant differences between age of the user group and non-user group ($\chi^2 = 4.421, p = 0.219$). There was no significant difference found in the marital status of farmers between user group and non-user group. Out of the total sample most of the farmers (90%) belong to married class as in the case of user group 88% were married and in non-user group 92% were married.

The result of chi-square statistics revealed highly significant differences in the education level between user group and non-user group ($\chi^2 = 23.28, p = 0.000$). In the user group 90% were educated of which 33% were literate at primary level of education, 30% were at secondary and senior secondary level and 27% were highly educated. In the non-user group 59% were literate mass only 16% were educated at secondary and senior secondary level and 14% were educated at graduate and above. Out of the total sample only 11% farmers were in illiterate band. The significant difference in the education level between users and non-users of information delivery models may be due to the fact that farmers having education above secondary level are more likely to make informed decisions on farming activities.

Table 7.1: Socio-Demographic Profile of Sample Respondents

Socio-demographic Variables	User (N=145)		Nonuser (N=145)		Total (N=290)		Chi-square statistics (p-value)
	n	%	n	%	n	%	
Gender							
Male	134	92%	132	91%	266	92%	0.182(0.67)
Female	11	8%	13	9%	24	8%	df=1
Marital Status							
Married	127	88%	134	92%	261	90%	1.877(0.171)
Unmarried	18	12%	11	8%	29	10%	df=1
Age Group							
<25 years	24	17%	16	11%	40	14%	4.421(0.219)
25-35 years	58	40%	50	34%	108	37%	df=3
36-50 years	50	34%	59	41%	109	38%	
>50 years	13	9%	20	14%	33	11%	
Average age (years)	39		36		37		
Education							
Illiterate	14	10%	17	12%	31	11%	23.28***(0.000)
Literate	48	33%	85	59%	133	46%	df=3
Secondary and Sr. Secondary	44	30%	23	16%	67	23%	
Graduate and above	39	27%	20	14%	59	20%	
Social Category							
General	94	65%	73	50%	167	58%	6.341**(0.0420)
OBC	43	30%	59	41%	102	35%	df=2
SC/ST	8	6%	13	9%	21	7%	
Occupation							
Farming	135	93%	142	98%	277	96%	8.38*(0.079)
Pvt. Job	1	1%	0	0%	1	0%	df=4
Student	4	3%	0	0%	4	1%	
Business	3	2%	0	0%	3	1%	
Labourer	2	1%	3	2%	5	2%	
Family Monthly Income							
<Rs 2000	6	4.1	13	9.0	19	6.6	11.121*(0.05)
Rs 2000-5000	48	33.1	56	38.6	104	35.9	df=5
Rs 5001-10000	52	35.9	56	38.6	108	37.2	
Rs 10001 - 15000	30	20.7	18	12.4	48	16.6	
Rs 15001-25000	7	4.8	2	1.4	9	3.1	
>Rs 25000	2	1.4	0	0.0	2	0.7	
Landholdings							
Marginal/small (up to 2ha)	18	12%	35	24%	53	37%	11.288***(0.004)
Medium (2-4 ha)	22	15%	32	22%	54	37%	df=2
Large (>4 ha)	105	72%	78	54%	183	63%	
Leased in land							
<5 ha	109	75%	133	92%	242	83%	14.380***(0.001)
5-10 ha	15	10%	5	3%	20	7%	
< 10 ha	21	14%	7	5%	28	10%	df=2

Source: Field Survey

The use of ICTs may not be constrained due to lack of formal education especially if there is a provision of adequate and appropriate content in the local language. As far as social groups are concerned 65% were in the user group and 50% were in the non-user

group belong to general category. Nearly one third of the respondents belong to Other Backward Class (OBC) category for both the groups however statistically a less significant difference was found as of social distribution pattern is concerned between both the groups ($\chi^2 = 6.431$; $p=0.042$). The chi-square statistics indicated a significant difference in income status of user group and non-user group ($\chi^2 = 11.121$, $p=0.05$). By comparing income level of both the groups, 21% of respondents from user group and 12% from non-user group were in the income band of Rs. 10000 to 15000 per month. In case of user group 6.2% farmers lie in the income band of >15000 and in non-user group 1.4% farmers have income >15000. This shows that respondents in user group were better off than respondents in non-user group.

In India farming is the main earning in rural areas. Table 7.1 showed that majority of farmers (96%) adopt farming as the primary occupation, this may be an enhancing provision for implementation of different ICT models to streamline the farmers in the nation development. In user group 24% farmers leased land of size of >5 ha while in non-user group it counts only 8%. Table 7.1 shows that user group farmers are more intended in leasing the larger size of land than non-user group farmers. This indicates the farmer's perception to increase production level by making their farm size enlarge. The chi-square statistics also showed a highly significant difference ($\chi^2 = 14.380$, $p=0.001$).

On the basis of land holding the sample divided into three categories: large (land holding size more than 4 ha), medium (land holding between 2-4 ha) and small/marginal (land holding up to 2 ha). Further distribution analysis of landholdings confirmed that 72% of user group farmers belong to large farm size which leads to the fact that user group farmers are more adoptable to latest farm technologies. Chi-square test indicated a highly significant difference in the land holding pattern of farmers ($\chi^2 = 11.288$, $p=0.004$). This also indicates that large farmers can be the opinion leaders for the small and marginal farmers in adopting the latest agricultural technologies as was previously confirmed by several studies. The results suggests that the two categories of farmers (users and non-users) exhibited statistically significant differences with respect to education, social category, occupation, income, landholding size and leasing of lands.

Table 7.2 reports the extensive data of the overall sample (290) of farmer's profile of using different sources of information regarding their '*Use*'; '*Own*'; '*Frequency of Use*' and their '*Impact on Agriculture*'. In addition to the types of channels used the quality of

information is of vital importance since its usefulness is determined by several criteria. Table 7.3 provided the quality perspective of different sources of information in agriculture decision making. The quality of information consists of five parameters i.e. '*Objectivity/Relevancy*'; '*Coverage*'; '*Accuracy*'; and '*Timing*'. The responses were recorded on a five point 'Likert' scale: very good = 5, good = 4, satisfactory = 3, poor = 2 and very poor = 1.

The multiple responses have been recorded for various information sources in agriculture/agribusiness decision making. Most of the respondents accessed wider sources of information. Other progressive farmers (89%), input dealer (94%), fellow farmers (84%) and local traders (65%) were topped the list as the most accessed sources of information regarding two way interpersonal nature of use. The frequency of usage of these sources showed varied response. Out of the total sample surveyed (290) a very less number (10%) of farmers responded that they did not use 'other progressive farmers' in accessing information whereas 32% farmers responded that they accessed it occasionally and 48% farmers accessed sometimes. 38% farmers responded average impact on agriculture in using information content through progressive farmers. The data indicated that OPF contribution in providing information is somehow considerable that may be due to small farmers consult for those unavailable/daily information needs from large farmers. From the quality perspective, information delivered by progressive farmers was found that only 27% of farmers got the information to the average relevance of the needs and accuracy whereas around 50% of farmers got average response on the coverage of agricultural information as well. While 43% of farmers responded that they received information well in time. The reason for this high percentage may be due to the fact that the small/marginal/medium farmers rely more on personal contacts.

By analyzing the pattern of fellow farmers/own as the sources of information in agricultural decision making, we found that 84% of farmers use it for accessing information and 79% of farmers own these information for making agricultural decisions. Apart from this 34% of the farmers use the information sometimes with quite a low quality perception. As perceived from the data it clearly indicates the farmer's very attitude towards acquirement of parental agricultural practices from the fellow farmers. The result also indicates that there exist a huge information gaps on various agricultural information measures.

Local traders were found as the third most important source in accessing information for agriculture decision making. Out of the total sample surveyed (290), we found that 64% of farmers received information by the means of 'local traders' and only 17% of the farmers owned these information content. The perception of quality and impact on agriculture were found as very low. Among the non-ICT interpersonal sources input dealers topped the list. In Table 7.2 data showed that quite a high percentage of farmers (94%) use the information delivered by the input dealers and also a large proportion of farmers (94%) own it. In Table 7.3 we found that a good percent of farmers responded the average quality of information on all parameters of quality dimension.

This may be attributed to the fact that non availability of other reliable sources of information or inaccessibility of formal institutions to farmers in information delivery provision. The reason for high dependency on input dealers may be due to the particular needs such as seeds, fertilizers and pesticides etc. which are the main source of transaction in rural areas were heavily accessed by farmers.

As perceived from Table 7.3 all these sources (progressive farmers, fellow farmers/own, local traders and input dealers) were responded well on quality of timing in getting information. This indicates that the ease in availability of information content is the important factor for farmers in accessing information.

Table 7.2: Farmer's Profile of Sources of Information, Frequency of Use and Impact on Agriculture/Agribusiness

Sources of information	Use (%)		Own (%)		Frequency of use (%)				Impact on agriculture (%)				
	Yes	No	Yes	No	Not at all	Occasionally	Some times	Usually	Not at all	Some what	Average	high	Very high
Radio	44.5	55.5	34.1	65.9	55.5	27.2	17.2	----	69.0	18.3	12.8	----	----
TV	87.9	12.1	57.9	42.1	15.9	46.9	34.8	2.4	49.7	44.8	4.8	----	----
Newspaper	83.8	16.2	69.3	30.0	17.9	58.6	22.1	1.4	54.5	44.8	0.7	----	----
Computer/Internet	29.0	71.0	24.5	75.2	72.1	14.1	12.8	1.0	76.6	10.7	7.2	5.2	0.3
Mobile	57.6	42.4	21.4	78.6	43.1	46.2	9.0	1.7	78.6	9.3	5.2	6.9	
KVK	27.2	72.8	27.9	72.1	91.0	9.0	----	----	95.2	4.8	----	----	----
VIC/KCC	6.6	93.4	9.3	0.9	73.1	24.8	2.1	----	76.6	18.6	4.8	----	----
Demonstrations	24.1	75.9	25.2	74.8	75.9	18.6	5.5	----	75.9	9.3	12.4	1.7	0.7
Fellow farmers	84.8	15.2	79.3	20.7	15.2	44.8	34.5	5.5	24.8	60.3	14.8	----	----
Local traders	64.5	35.2	63.4	0.4	35.2	47.9	16.9	----	40.3	57.6	2.1	----	----
Input dealers	94.1	5.9	92.8	7.2	5.9	28.3	56.9	9.0	8.3	35.5	49.0	7.2	----
NGOs (N=218)	4.1	71.0	3.8	71.4	71.0	2.4	1.7	----	71.0	2.1	1.7	0.3	----
Cooperatives	31.0	69.0	30.3	69.7	69.7	29.7	0.7	----	70.3	25.2	4.5	----	----
Extension workers (N=218)	20.0	55.2	19.3	55.9	53.1	20.0	2.1	----	58.3	15.5	1.4	----	----
Progressive farmer	89.3	10.0	89.0	11.0	10.0	32.4	48.6	8.3	12.1	49.3	38.6	----	----
Total					47.0	30.1	18.9	4.2	57.4	27.1	11.4	4.3	0.5

Source: Field Survey

Now we analyze mass media method of information dissemination in agricultural decision making process. Various mass media such as TV (88%) was reported to be highest responded source by farmers followed by newspaper (84%), mobile (58%) and radio (45%). The higher usage percentage of TV may be attributed to the visual nature of its medium of information delivery and of equipped with diversified content of information. Television may be used for watching movies, religious programs (i.e. entertainment etc.) and news on a regular basis. In Table 7.2 we found that 58% farmers owned TV as a personal gadget and 45% of farmers responded that the coverage of information content related to agriculture decision making was found to be minimal while the average accuracy of the information was responded by 25.2% of farmers. Only 6.9% of farmers reported that information was on time however, majority of the farmers received information by the means of TV source that was not on time and consequently the average impact on agriculture was found to be low. The low percentage may be due to the fact that most of the programs on TV are not currently updated.

Accessing information through radio was responded by a very less number (10-15%) of farmers on average level of quality of information. 18.3% of farmers reported average impact on agriculture by the means of radio. As perceived from the analysis radio was accessed by those farmers who reside in backward region. It indicates a huge potential for information providing organizations to facilitate farmers through radio media e.g. a number of initiatives like Tarahaat provide agricultural related information to farmers through radio in Jhansi region. Only 10.3% of farmers responded that they got information well in time. The reason of not accessing information in time may be due to the fact that radio programs are broadcasted on particular time basis so the farmers were unable to get information on time due to their busy schedule in farming practices.

In Table 7.2 we found that out of the total farmers surveyed (290), 84% of farmers used news paper to get any information whereas 69% of farmers 'owned' it to get information. The difference between 'use' and 'own' percentage of farmers may be due to the fact that the farmers read newspapers at the village grocery store or tea shop. With regard to the quality of the information a very less percentage of farmers (around 10%) gave a neutral/average response by assigning as 'average' rating because information received from newspapers are not updated. 0.7% of farmers got impact on agriculture on an 'average' rating and 44% of farmers on 'somewhat' rating. The high percentage of access

may also indicate that large landholders (63% of overall sample) use newspapers for news and other social matters like matrimonial, national and international news etc.

Computer/internet was accessed by 29 % of respondents. The low percent of access is mainly due to non availability of technology, higher accessing cost and infrastructural limitations. On an average around 7-8% of respondents identified computer/internet on 'good' rating whereas 12.8% of respondents use computer/internet 'sometimes' and 14.1% use it occasionally. Out of the total sample (290) collected, 12.4% of farmers gave 'high/neutral' response on quality parameters while accessing the information on agricultural decision making. As perceived from the analysis, farmer's adoption on computer/internet may provide a space for information intermediaries in making a provision for selection of proper media under an effective institutional infrastructure.

In Table 7.2, we found that out of the total sample surveyed (290), 57.6% of farmers use mobile phones in accessing information for making agricultural decisions and 21.4% of farmers owned it. With regard to parameters (objectivity, coverage, accuracy and timing) related to quality of the information a quite low percentage (10%) of farmers gave a neutral response in making agricultural decisions. The above analysis indicates that the farmers were depending on other sources in using mobile services for making agricultural decisions e.g. lifeline initiative facilitates farmers via field volunteers mostly by their phones. This gives an implication for various information delivery models to diversify their programs via mobile services. Since a broad development in mobile connectivity and infrastructure has taken place in the recent past.

Table 7.3: Farmer's Response on Quality of Information in Agricultural/Agribusiness Practices by Sources

Sources of information	Objectivity		Coverage		Accuracy			Timing		
	Some what	Average	Some what	Average	Some what	Average	High	Some what	Average	High
Radio	53 (18.3)	29(10)	60 (20.7)	44 (15.2)	52 (17.9)	51 (17.6)	-----	49 (16.9)	30 (10.3)	-----
TV	71 (24.5)	17 (5.9)	129(44.5)	21 (7.2)	110 (38)	73 (25.2)	10(3.4)	117(40.3)	20 (6.9)	-----
Newspaper	92 (31.7)	9 (3.1)	152(52.4)	14 (4.8)	169(58.3)	5 (1.7)	-----	147(50.7)	12 (4.1)	-----
Computer/Internet	21 (7.2)	18 (6.2)	39 (13.4)	13 (4.5)	24 (8.3)	25 (8.6)	23(7.9)	27 (9.3)	23 (7.9)	22 (7.6)
Mobile	15 (5.2)	26 (9.0)	18 (6.2)	26 (9.0)	34 (11.7)	14 (4.8)	23(7.9)	35(12.1)	26 (9.0)	3 (1.0)
KVK	15 (5.2)	-----	16 (5.5)	-----	19 (6.6)	-----	-----	14 (4.8)	-----	-----
VIC/KCC	48 (16.6)	6 (2.1)	61 (21.0)	20 (6.9)	56 (19.3)	25 (8.6)		61 (21.0)	7 (2.4)	1 (0.3)
Demonstrations	46 (15.9)	24 (8.3)	24 (8.3)	39 (13.4)	23 (7.9)	38 (13.1)	11(3.8)	54 (18.6)	10 (3.4)	-----
Fellow farmers	151 (52)	29 (10)	165(56.9)	64 (22.1)	173(59.7)	65 (22.4)	-----	68 (23.4)	108(37.2)	62(21)
Local traders	97 (33.4)	7 (2.4)	125(43.1)	32 (11.0)	182(62.8)	8 (2.8)	-----	100(34.5)	88(30.3)	3 (1.0)
Input dealers	118 (41)	123(42)	98(33.8)	140(48.3)	91 (31.4)	164(57)	11(3.8)	50 (17.2)	154(53.1)	54(18)
NGOs	3 (1.0)	4 (1.4)	7(2.4)	4 (1.4)	18 (6.2)	2 (0.7)	3 (1.0)	7 (2.4)	6 (2.1)	-----
Cooperatives	62 (21.4)	12 (4.1)	78(26.9)	23 (7.9)	73 (25.2)	26 (9.0)	-----	79 (27.2)	15 (5.2)	3 (1.0)
Extension workers	22 (7.6)	5 (1.7)	36(12.4)	12 (4.1)	45 (15.5)	5 (1.7)	3 (1.0)	37 (12.8)	5 (1.7)	-----
Progressive farmer	152(52.4)	78 (27)	109(37.6)	145(50)	112(38.6)	140(48)	7 (2.4)	51 (17.6)	125(43.1)	67(23)

Source: Field survey

Note: Value in Parenthesis shows percentage

In Table 7.2, use of extension services were responded by 20% of farmers whereas the response on quality perception on 'average' rating was quite low in all parameters like objectivity, coverage, accuracy and timing. Recently government has initiated several programs to make farmers more informed like ATMA and KVKs services at block level which are performing well. The data reported that 27.2% of farmers use KVKs services to get agricultural information and it was owned by 27% of farmers. With regard to quality of information 12% of farmers reported a neutral response by assigning as 'average' rating. It means that the information provided by the KVKs is not up to the level of quality and needs further improvement in its structure and approach to meet the farmer's agricultural information needs accordingly.

In Table 7.2 & 7.3, we found that the Village information center (VIC)/kisan call centers (KCC) were used by less number of farmers as a source of agricultural information. The quality of information received by the means of KCC/VIC was found to be very low. NGOs as a source of agricultural information were used by only 4.1% of farmers with a low quality of information. 31% of farmers use cooperative sources for accessing agriculture information and the parameters of quality of information was found to be low on 'average' rating. So far the above analysis indicates that there is a need to improve service provision of VCC/KCC, NGOs and cooperatives.

Demonstration has been emerged as one of the effective source in information disseminating among rural farmers. 24.1% of farmers reported that they use it for getting agricultural information. About 13% of farmers gave neutral response when assigning the coverage & accuracy of information whereas timing of receiving the information was not satisfactory. Only 3.4% farmers reported neutral response by assigning an 'average' rating for timing of demonstration. As seems from the analysis inadequate timing of demonstration may be caused due to less deterministic, insincere and unaccountable approach of field workers who often lack the provision of services and training.

7.2 Sources of Information on Different Needs of Agricultural Decision Making

The agriculture sector in India has become a knowledge intensive industry. The challenges faced by the farmers are to acquire information from different sources and make decisions on the basis of that knowledge (Armstrong et al., 2011). Farmers merely access research data that is produced by government agencies to provide relevant information for their specific farming practices.

Table 7.4: Sources of Information on Agriculture Decision Making Process (%)

Sources of information	Planning	Input	Cultivation	Post-harvest	Marketing Distribution	Overall %
Participating In						
Training Programme	0.1	1.7	0.0	0.0	0.7	0.5
KVK	1.2	5.2	0.2	0.0	3.0	1.9
Extension Worker	0.3	0.5	0.0	0.0	0.1	0.2
Television	0.0	0.4	0.0	0.0	0.8	0.3
Radio	0.2	0.1	0.0	0.0	0.7	0.2
News Paper	0.0	0.6	0.0	0.0	3.0	0.7
Internet	0.0	0.2	0.0	0.0	1.0	0.2
Government						
Demonstration	0.3	0.4	0.0	0.0	0.3	0.2
Input Dealer	4.5	16.3	9.6	0.0	0.1	6.1
Other Progressive						
Farmer	6.6	14.5	8.7	6.0	13.9	9.9
Farmer Study Tour	0.0	0.0	0.0	0.0	0.0	0.0
Private Agency/						
NGO	0.2	0.8	0.2	0.3	0.5	0.4
Primary Cooperative						
Society	1.1	5.4	2.5	0	0.9	2.5
Out Buyer/ Food						
Processor	0.0	0.0	0.0	2.2	11.0	2.7
Credit Agency	0.0	0.0	0.0	0.0	0.0	0.0
IFFCO Proc.	0.3	0.6	0.2	1.2	0.3	0.5
Books	0.0	0.0	0.0	0.0	0.0	0.0
Other Farmers	3.8	12.9	7.0	4.5	6.5	6.9
Own	45.7	16.0	63.4	67.2	33.0	45.1
Others	17.9	12.4	0.7	13.2	7.8	10.4
Life Line	1.3	1.8	2.8	0.2	0.0	1.2
E-Choupal	4.4	4.0	3.3	2.0	5.3	3.8
TKS	1.3	2.3	1.4	10.8	0.0	3.2

Source: Field survey

However, nearly 60% of Indian farmers do not access any information on modern technology from any source at all India level (NSSO, 2005). Farmers nowadays adopted latest technologies in farming practices but they become an active player in the whole agricultural supply chain system. Ali (2010) identified three stages i.e. production

planning, cultivation practices, post-harvest management and marketing in the agriculture supply chain.

The farmers in the study area received agricultural information from a wide range of sources and channels that includes radio, television, newspaper, computer/internet, mobile phones, Krishi Vigyan Kendras (Farm Science Centers), farmer study tour, training programs, fellow farmers/own, cooperative agencies, input dealers, extension workers, other progressive farmers, private agency/NGOs, output buyer/food processors, credit agency, IFFCO procurement, books, government demonstrations, Lifeline initiative, e-choupal initiative, Tata Kisan Sansar and others.

Table 7.4 describes the sources of information on different stages of agricultural decision making process (ADMP) which includes planning, input, cultivation, post-harvest management, and marketing & distribution decisions. Source wise responses have been calculated by taking average percentage of all the activities included for each of the particular stages of ADMP. Parental/own information (45.1%), other progressive farmers (9.9%), input dealers (6.6%) and e-choupal (3.8%) were identified as the most important sources to make decisions regarding agriculture/agribusiness activities. The respondents were observed on different stages of agriculture decision making process including some missing and no-response observations also. In Table 7.4, 45.7% farmers got planning level information from their 'elders/own'; 6.6% farmers from 'progressive farmers'; followed by 'input dealer' (4.5%); e-choupal (4.4%); other farmers (3.8%), lifeline (1.3%), TKS (1.3%). The data gives the perception that majority of the farmers were depend on their parental practices at planning level.

For input decisions farmers identified input dealers (16.3%) as the major source for delivery of information followed by own (16%), other farmers (12.9%), progressive farmers (14.5%), primary cooperative society (5.4%), KVK (5.2%) and information delivery models (6.6%). As perceived from the data it shows that the transactional information was primarily made from input dealers but farmers were also depending on parental and inter socio link. In Table 7.4 farmers usually adopt cultivation and harvesting information from parental source (own) depicting that farmers trust in old fashioned cultivation and harvesting practices. Marketing and distribution decisions were adopted from diverse sources of information such as output buyer, progressive farmers, news papers, e-choupal etc. The detailed sources of information and quality of

information with respect to individual agricultural activities at different stages of agriculture decision making will be discussed later in this chapter.

7.3 Quality and Access of Information Delivery on Agricultural Decision Making Process

Quality of agricultural information is a basic requirement of the farming community in current agricultural systems as it plays an essential role in raising farmer's level of knowledge on best practices across the agriculture production chain. Farmer's perceptions on quality of information on various aspects of agriculture decision making, as well as their sources of information were recorded on a 5-point 'Likert' scale: very good = 5, good = 4, satisfactory = 3, poor = 2 and very poor = 1 (Tables 7.5, 7.6, 7.7, 7.8 and 7.9).

The usage level of information on planning activities i.e. how to grow, seed selection and land allocation are higher in comparison to activities regarding cropping pattern, how much to grow, what crop to grow and crop diversification. With respect to the quality of information, planning activities like how to grow (70%), land allocation (48%), seed selection (48%) gave a neutral response by the respondents/farmers as assigning 'satisfactory' rating. The other remaining activities responded as 'very poor' and 'poor' by majority of the farmers on the quality perspective. On the other aspect five out of nine activities at planning level showed that the information received was satisfactory (higher mean values) i.e. what crop to grow, how to grow, land allocation, lease-in/out and seed selection.

Table 7.5: Farmers' Perceptions of the Quality of Information on Planning Decisions by Activity

Agri. activities	Very poor		Poor		Satisfactory		Good		Very Good		Total	Mean ± SD	
What crop to grow	153	53%	76	26%	52	18%	8	3%	1	0%	290	100%	3.13 ± 0.625
Crop diversification	153	53%	76	26%	52	18%	8	3%	1	0%	290	100%	1.72 ± 0.878
How to grow	0	0%	34	12%	203	70%	51	18%	1	0%	290	100%	3.06 ± 0.580
Land allocation	26	9%	69	24%	139	48%	53	18%	3	1%	290	100%	2.79 ± 0.882
How much to grow	142	49%	48	22%	15	7%	3	1%	0	0%	216	100%	1.37 ± 0.729
Lease-in Non-lease	80	28%	73	25%	62	21%	59	20%	13	4%	290	100%	2.47 ± 1.226
Soil testing soil sampling	188	87%	26	12%	1	0%	0	0%	0	0%	216	100%	1.13 ± 0.358
Cropping pattern	136	47%	104	36%	39	13%	11	4%	0	0%	290	100%	1.74 ± 0.831
Seed selection	0	0%	35	12%	139	48%	110	38%	6	2%	290	100%	3.30 ± 0.703

Source: Field Survey

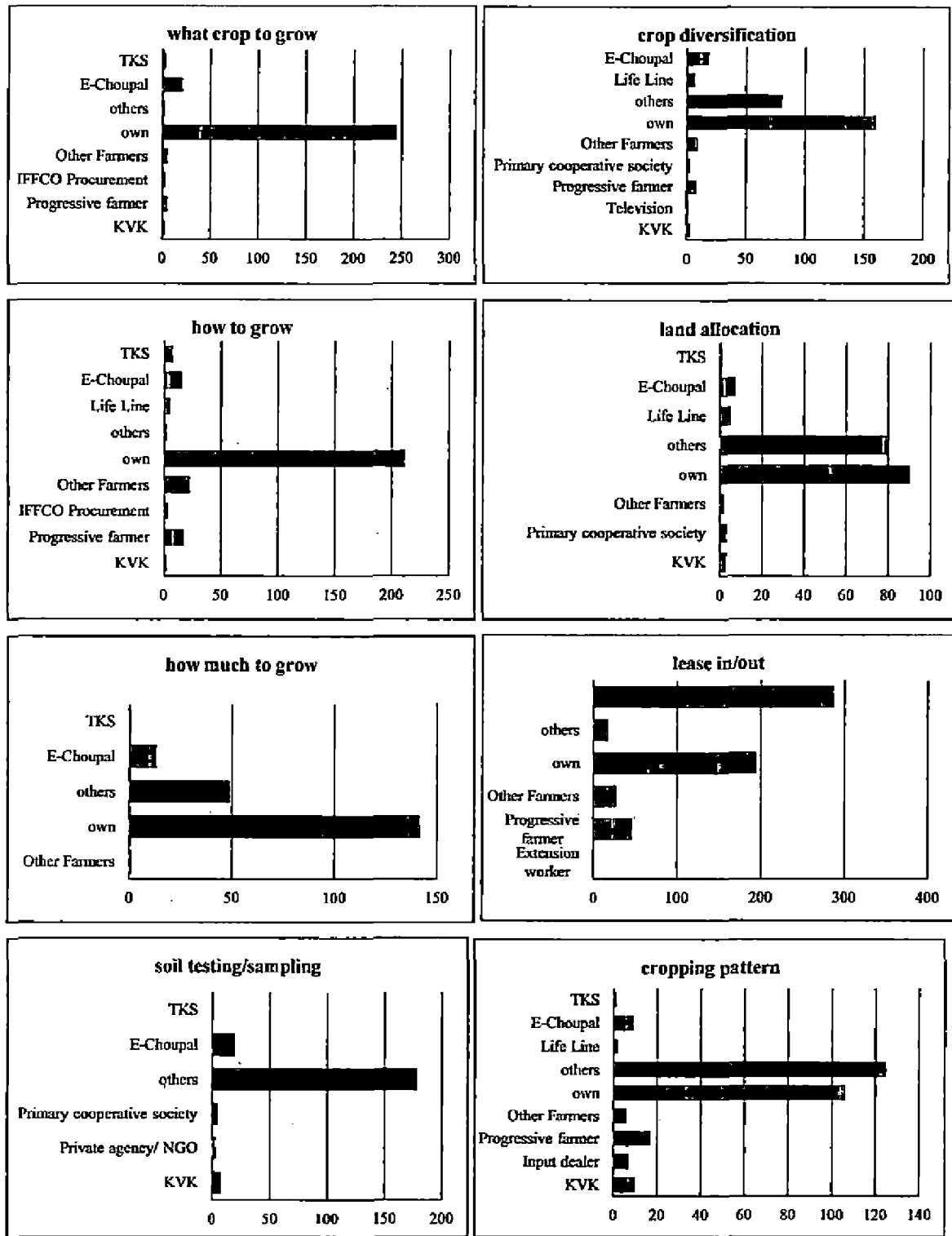
Table 7.6: Farmers' Perceptions of the Quality of Information on Input Decisions by Activity

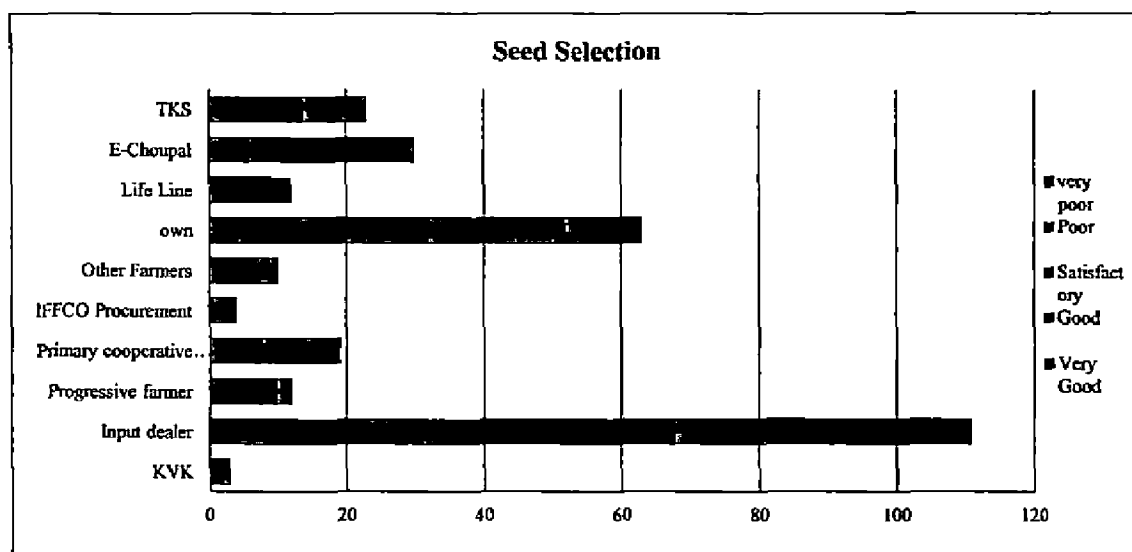
Agri. activities	Very poor		Poor		Satisfactory		Good		V. good		Total	Mean ± SD	
Input prices and availability	0	0%	20	7%	184	63%	80	28%	6	2%	290	100%	3.25 ± 0.606
Use of fertilizers	0	0%	60	21%	133	46%	94	32%	3	1%	290	100%	3.14 ± 0.745
Seed sources	2	0%	33	11%	138	46%	111	38%	6	2%	290	100%	3.30 ± 0.722
Technical support	44	15%	110	38%	100	34%	33	11%	3	1%	290	100%	2.45 ± 0.919
Use of Farm machinery	3	1%	112	39%	153	53%	22	8%	0	0%	290	100%	2.67 ± 0.629
IPM	40	56%	10	8%	9	8%	13	18%	0	0%	72	100%	1.93 ± 1.191
Insecticides/Weed mgmt	69	24%	100	34%	85	29%	36	12%	0	0%	290	100%	2.30 ± 0.969
Credit support	106	49%	109	50%	0	0%	1	0%	0	0%	216	100%	1.52 ± 0.528
Irrigation sources	0	0%	74	26%	184	63%	31	11%	1	0%	290	100%	2.86 ± 0.598
Training	150	52%	96	33%	40	14%	4	1%	0	0%	290	100%	1.65 ± 0.767
Government subsidies	108	37%	142	49%	37	13%	3	1%	0	0%	290	100%	1.78 ± 0.702

Source: Field Survey

Figure 7.1: Quality Responses by Sources at Planning Level of Decisions

very poor ■ poor ■ satisfactory ■ good ■ very good ■





Source: Field survey

On an average about 10 percent of the farmers responded that the information was 'good' for overall planning decisions. This gives the view that there exist a quality space for information provider for both public and private organizations to relocate their activities at planning level in order to make farmers more efficient and progressive minded at initial level of farming practices (Table 7.4).

Figure 7.1 illustrated the status of quality of information received by farmers on their planning decisions by various sources. Regarding quality of information by sources for individual activities, major sources of information were interpersonal means which comprised of very poor and poor quality response except for seed selection, soil testing and cropping pattern. Farmers do not always prefer to seek information from them (especially when faced with a new problem) because they are not able to give new information due to the similarity in their socio-personal status.

Farmers also approached the source 'Others' for crop diversification, land allocation, how much to grow, cropping pattern and soil testing. The average response on quality was 'very poor' and 'poor'. Traditional ICTs such as radio, TV, mobile etc. were also responded by very few farmers for planning related decisions. Information delivery models (e-choupal, TKS, lifeline, IFFCO procurement) seemed to be more adopted by respondents for crop selection decision.

For soil testing decisions e choupal has been emerged as a single source (6.9%) in providing information. Farmers recorded a poor quality response for soil testing. As perceived from the data, 67.2% of farmers made leasing decisions from the source 'own'. It concludes that the leasing decisions adopted by most of the farmers are made at village

level on personal basis. The selection of seeds was adopted primarily from input dealers (38.3%) followed by own (21.7%), e-choupal (10.3%), TKS (7.9%), PCS (6.6%), progressive farmers (4.1%) and lifeline (4.1%). About 21.7% of farmers adopted seeds information from their old experiences.

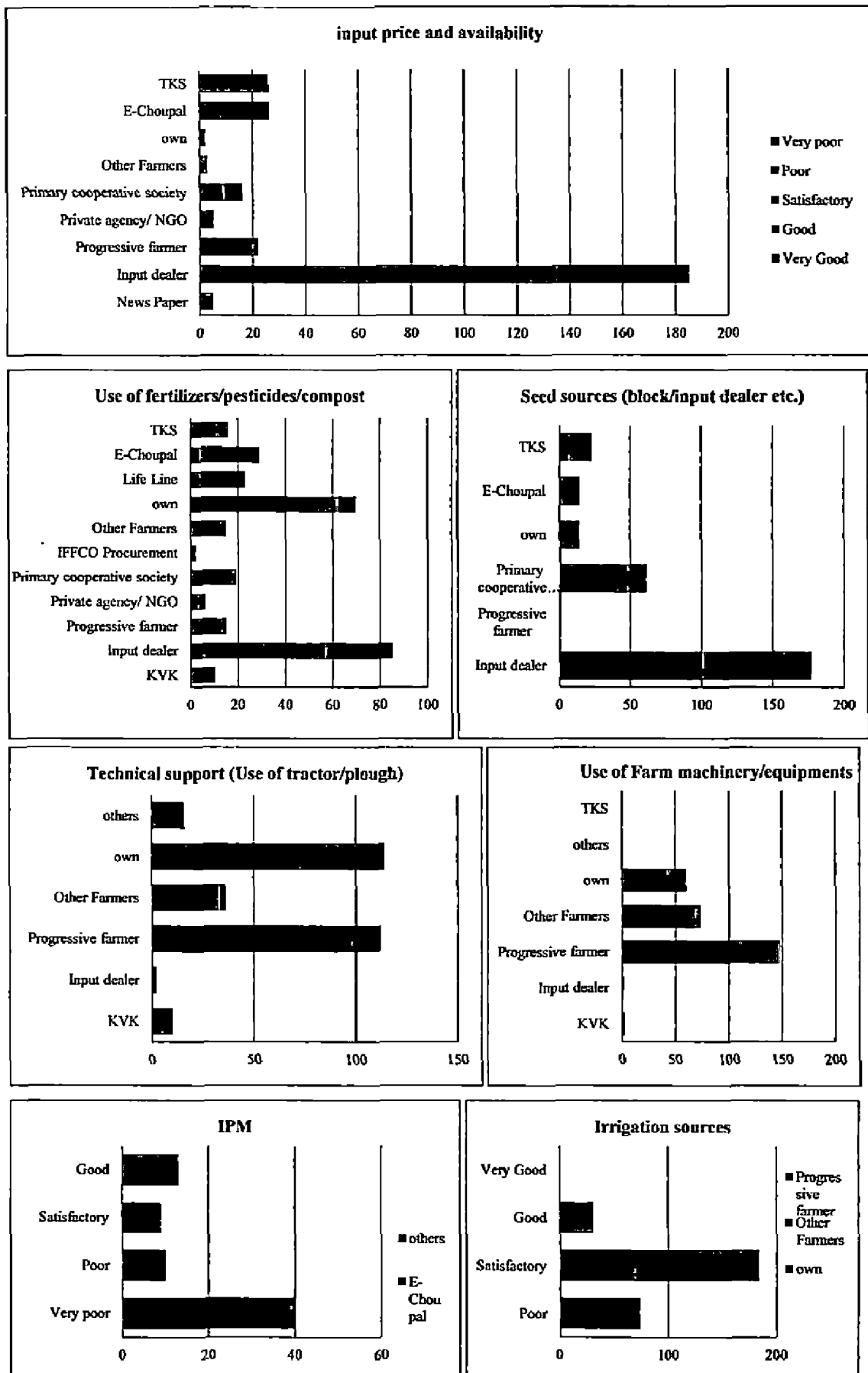
A new trend has been witnessed that most of the respondents (67%) approached to government and private organizations for selection of seeds. It indicates toward farmer's progressive approach in selection of seeds. With respect to quality level of the sources, information delivery models like e-choupal, TKS etc. provided satisfactory and good quality information for all the agribusiness activities. This implies that there exists a huge potential to improve the quality of information delivery by adopting modern information technology models because most of the respondents were not satisfied of information quality received from other sources. Also it shows the inefficiency, lack of reach and uncertain nature of government and private enterprises that discourage the farmers in seeking and using the latest know-how.

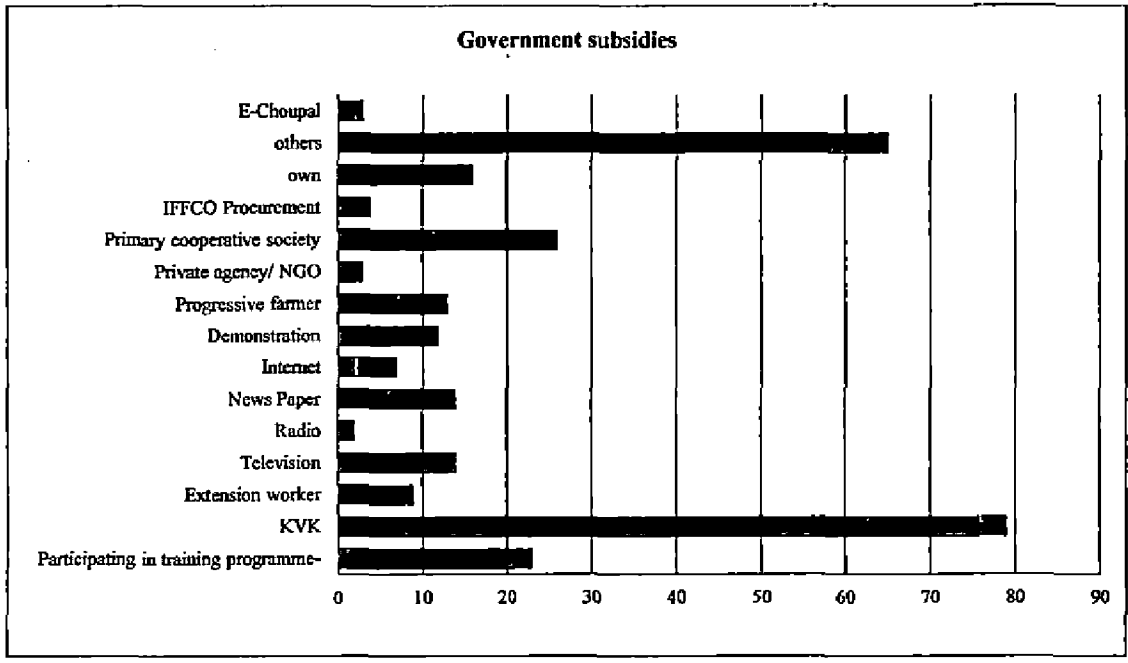
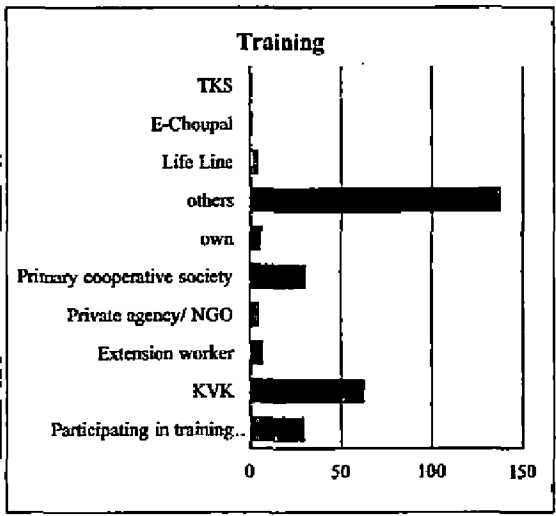
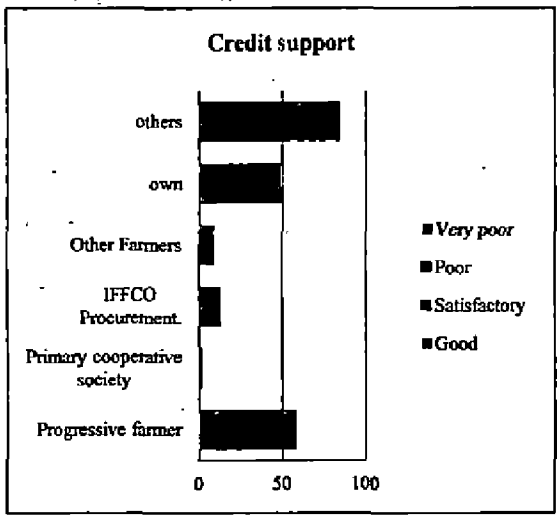
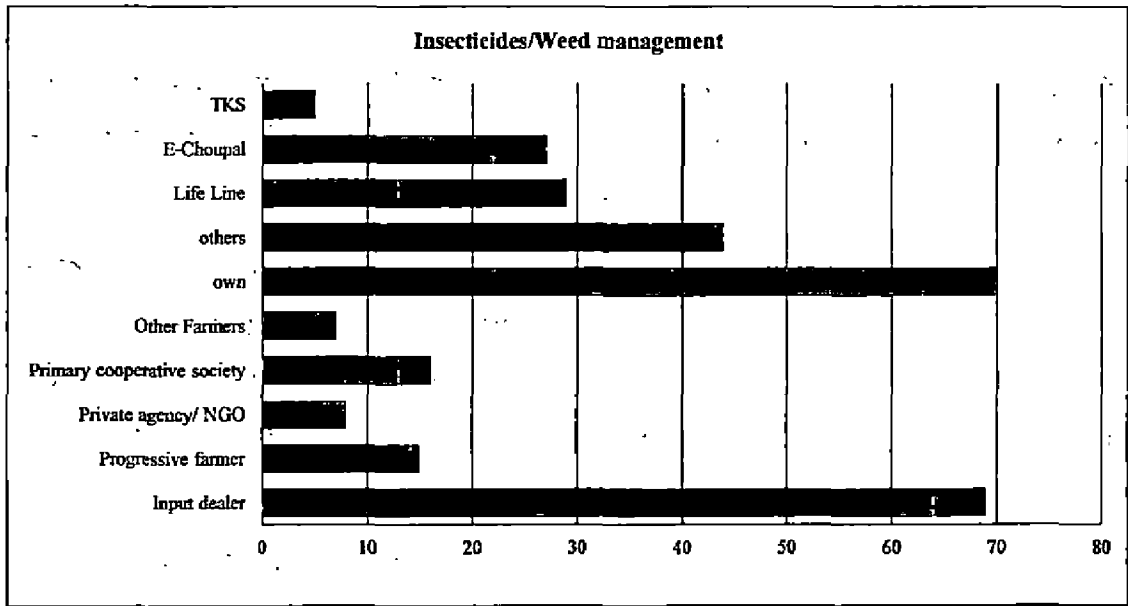
The usage level of information at input level on IPM, credit support, and training was lower than rest of the activities i.e. input price and availability, use of fertilizers etc. With regard to quality of information (six out of eleven activities) some of the input activities like input price and availability (63%), irrigation sources (63%), use of farm machinery (53%), use of fertilizers (46%) and seed sources (46%) grade a neutral response by assigning 'satisfactory' rating. The other input activities beside their high usage level were poorly responded on quality perception such as technical support (38%), government subsidies (49%), insecticides and weed management (34%) etc. However farmers posed a good faith in accessing information on input price (28%), use of fertilizers (32%) and sources of seeds (32%) by assigning 'good' rating (Table 7.6).

For various input activities responses were recorded regarding the quality of information by different sources. In Figure 7.2 input dealers were identified as the most reliable source of information for input price and availability, use of fertilizers and pesticides, seed sources, insecticides and weed management. Besides this, farmers also collected information by traditional means of low quality for the activities such as use of fertilizers, technical support, farm machinery, irrigation sources and insecticides & weed management. It implies that farmers were not aware or less inclined to update themselves for the above input activities and these void spaces could be filled up by facilitating updated and relevant information to the famers by modern ICT tools.

Figure 7.2: Quality Responses by Sources at Input Level

very poor ■ poor ■ satisfactory ■ good ■ very good ■





Source: Field Survey

The other sources like government and private organizations (Cooperatives, NGOs, KVK, and information delivery models) were found as reliable sources of information for some of the activities although they were less responded by farmers.

In Figure 7.2 we found that e-choupal initiative provided 'good' quality of information for four activities, of which integrated pest management (IPM) was only facilitated by e-choupal model. The above discussion gives the results that government and private sector should fill the space by establishing efficient information delivery mechanism for the activities for which the quality response was 'Very Poor' and 'Poor'.

The study also revealed that the farmers were more aware of input activities like fertilizers, insecticides & weed management, government schemes offered and training related to farming because these activities were responded by many sources. The activities such as farm machinery/equipments and sources of irrigation were totally dependent on the source 'own'; 'other farmers' and 'progressive farmers'. It may be due to the lack of infrastructural and technological reach as well as costing factor of agricultural equipment/machinery which abide them to make innovative use of latest implements.

Credit support facilitated mostly from the local money lenders, mainly from the sources like 'progressive farmers' and 'family/own'. However some of the cooperatives made financial arrangements to farmers but they were of poor quality. The constraint of poor access to credit might be lack of collateral and unavailability of credit on time. The major purposes of getting credit might be to meet family requirement. As it clearly indicated that the farmers lacked financial instruments, it gives policy recommendation for governments to implement more effective and easy financial service provisions.

In Table 7.7 and Figure 7.3 we found that more than 50% of farmers gave neutral (satisfactory) response for most of the cultivation decisions. All the activities showed a mean score of around 3, which means a 'satisfactory' score for quality of information on cultivation decisions. Quantity of seed and quantity & frequency of fertilizers assigned 'good' response by farmers and this information was collected from multiple sources. It indicates that these activities are on farmer's preference list. They generally showed two distinct patterns in gathering information. The first one was 'family/ own' and the other was 'input dealer'. In the view of quality of information for these two patterns, input dealers provided better quality in comparison to paternal information received.

Table 7.7: Farmers' Perceptions of the Quality of Information on Cultivation Decisions by Activity

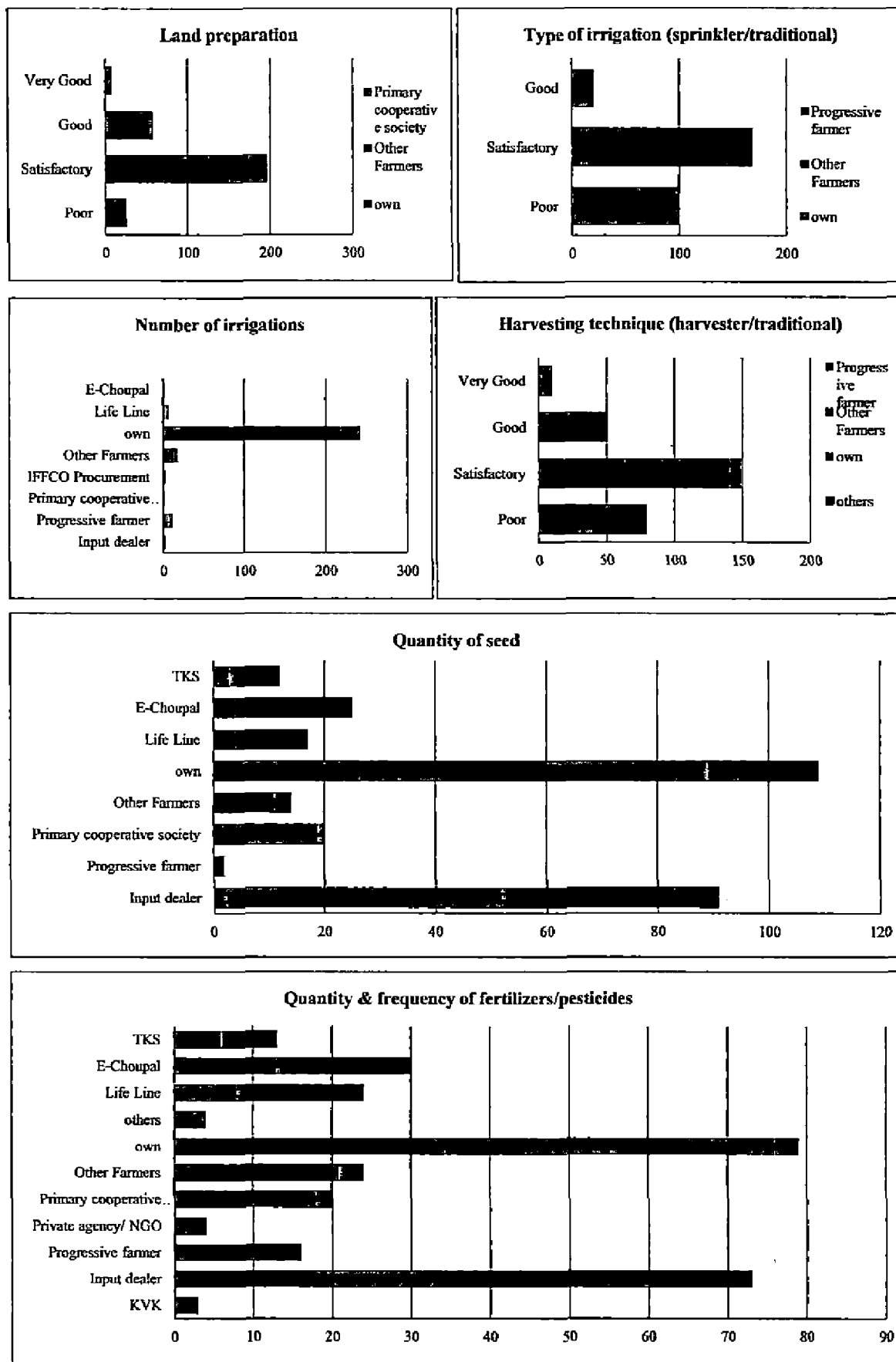
Agri. activities	Satisfactory		Good		V Good		Total (%)		Mean± SD		
Land preparation	26	9%	197	68%	58	20%	9	3%	290	100	3.17±0.621
Quantity of seed	30	10%	152	52%	98	34%	8	3%	290	100	3.28±0.711
Number of irrigations	71	24%	183	63%	36	12%	0	0%	290	100	2.88±0.596
Type of irrigation	100	34%	169	58%	21	7%	0	0%	290	100	2.73±0.587
Quantity & freq. of fertilizer./pest.	50	17%	154	53%	81	28%	5	2%	290	100	3.14±0.709
Harvesting technique	80	28%	149	51%	51	18%	10	3%	290	100	2.97±0.769

Source: Field survey

The proper ratio of seeds, fertilizers and pesticides can reduce the environmental, land and productivity degradation. The data also indicated that the farmers who were concerned with any of the government and private organization got more trusted information for quantity of seed and frequency of fertilizers/pesticides. Apart from this, farmers use interpersonal sources of information for rest of the four activities of low quality. On the quality parameter farmers personal experiences were recorded as 'satisfactory' and 'good' for land preparation, number of irrigations and type of irrigation. It indicates farmer's inclination about traditional irrigation pattern. Though several irrigation methods have come into existence i.e. sprinklers irrigation, by imparting training and education to farmers the wastage of water and financial burden on farmers could be reduced.

Figure 7.3: Quality Responses by Sources for Cultivation Decisions

very poor ■ poor ■ satisfactory ■ good ■ very good ■



Source: Field Survey

Table 7.8: Farmers' Perceptions of the Quality of Information on Post-harvest Decisions by Activity

Agri. activities	Very poor	Poor	Satisfactory	Good (%)	V. Good	Total (%)	Mean ± SD
Time of harvest	0	7	165	109	9	290	3.41 ± 0.595
Cleaning	131	68	81	10	3	290	1.90 ± 0.928
Sorting and grading	87	94	95	14	5	290	2.12 ± 0.899
Weighing	121	94	58	17	6	290	2.70 ± 0.712
Packaging	119	113	56	2	0	290	1.80 ± 0.769
Storage	121	94	58	17	6	290	1.90 ± 0.919
Transportation/logst	9	116	119	41	14	290	2.71 ± 0.809
Inventory decisions	145	49	22	0	0	216	1.43 ± 0.672

Source: Field survey

Table 7.9: Farmers' Perceptions of the Quality of Information on Marketing & Distribution Decisions by Activity

Agri. activities	Very poor	Poor	Satisfactory	Good	V. Good	Total (%)	Mean ± SD
Market prices	0	129	116	41	4	290	2.72 ± 0.753
Minimum support price (MSP)	44	95	69	8	0	216	2.19 ± 0.799
Sell at farm gate/ marketing	71	44	12	17	2	146	1.87 ± 1.072
Selection of marketing channel	0	102	145	36	7	290	2.82 ± 0.736
Selling at distant market/local	97	39	109	39	6	290	2.37 ± 1.140
Nature of transaction	4	44	146	89	7	290	3.18 ± 0.763
Public/private transportation	6	111	124	41	8	290	2.77 ± 0.817

Source: Field survey

In Table 7.8 and Figure 7.4 quality of information and sources of information for various post harvest activities are described. As perceived from the data two out of eight (time of harvest and transportation/logistics) activities responded by most of the farmers in comparison to other six activities. On the quality perception harvesting time found to be most trusted information among farmers (mean value=3.41). Weighing and transportation/logistics gave neutral response on quality parameter of mean value 2.70 and 2.71.

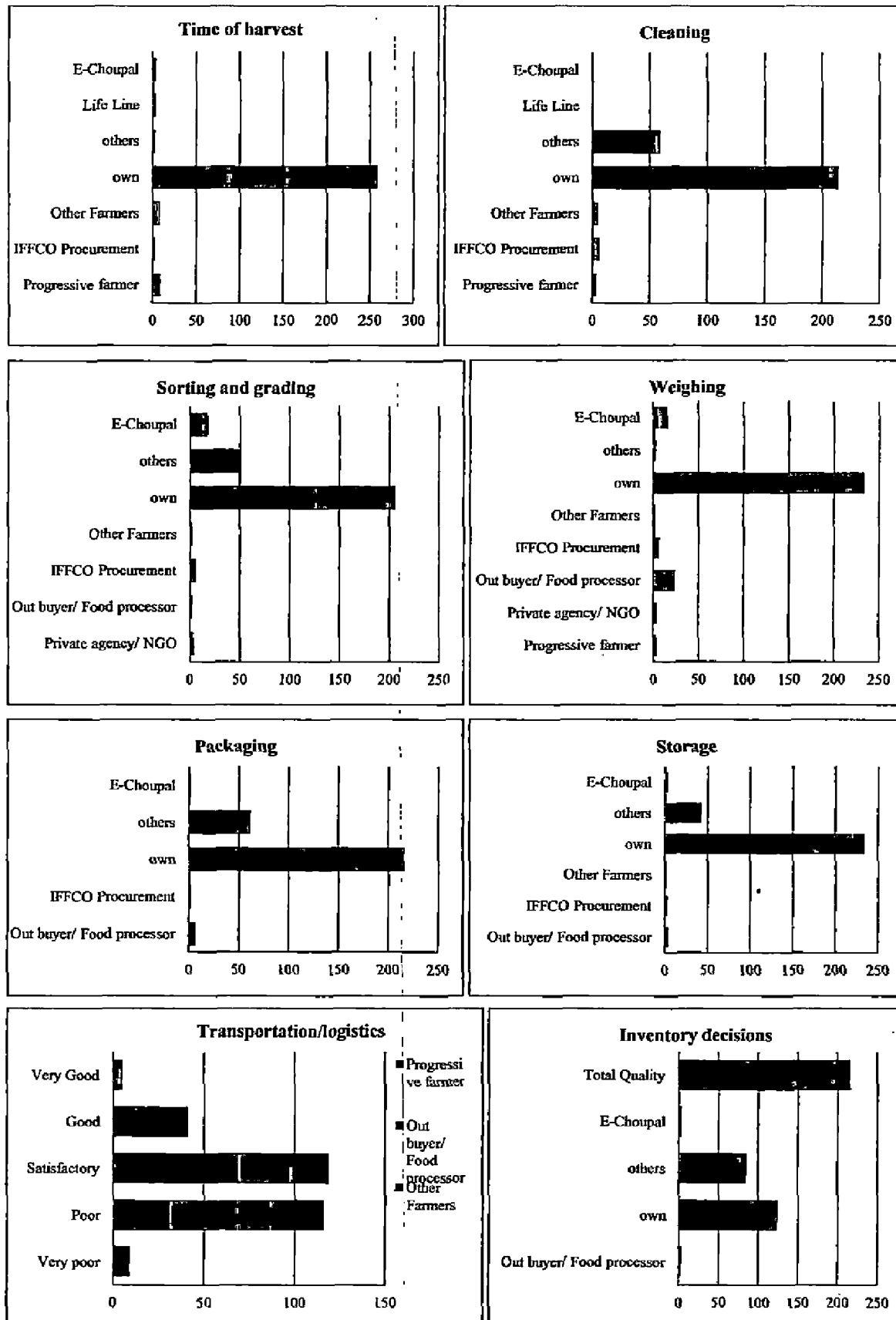
The overall quality response was measured as 'poor' for cleaning, sorting/ grading, packaging, storage and inventory decisions. About 20% of farmers responded that the quality of information for these activities was satisfactory. The farmers mostly use their family information for most of the post harvest activities like time of harvesting, cleaning, sorting/grading, weighing, and storing/inventory. Output buyers/food processors were less responded by farmers by assigning on 'average' rating. This indicates the lack of farmer's persuasiveness to these activities and the lack of innovation in business modeling approach.

Study also found that farmers who made transactions with other information delivery models (although a very less number of farmers consulted to these activities) received good quality of information. It leads to a strong recommendation that entrepreneurial nature of farming may be achieved by facilitating post harvest information and services especially on sorting, grading, inventory etc. to the farmers at grass root level and making them active stakeholders in agricultural supply chain.

In Table 7.9 and Figure 7.5 quality of information and sources of information for various marketing and distribution activities are described. Accessing marketing price for the produce rated as highest (100%) demanded information by the farmers followed by the activities like marketing channels, nature of transaction and types of transportation. Farmers were in information deficit situation for most of the activities (lower mean values- in Table 7.9). 45% farmers responded that quality of information for market price and MSP was found to be 'poor'. It may be caused due to delivery of outdated information provided by various information sources.

Figure 7.4: Quality Responses by Sources for Post-Harvest Decisions

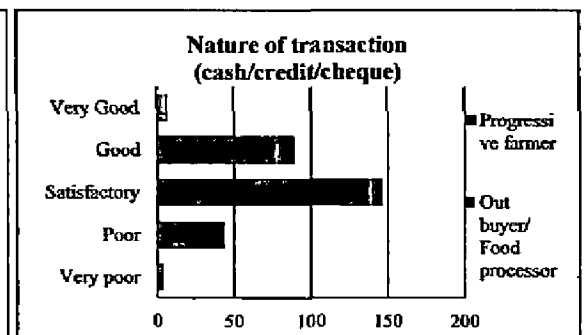
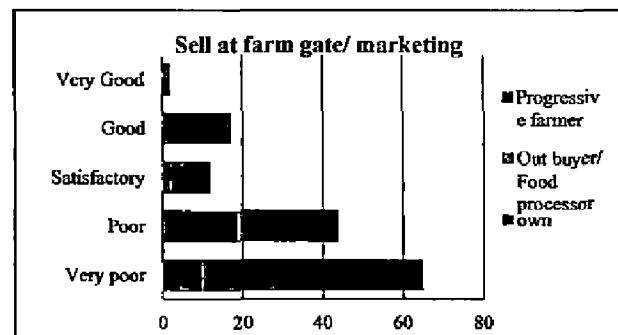
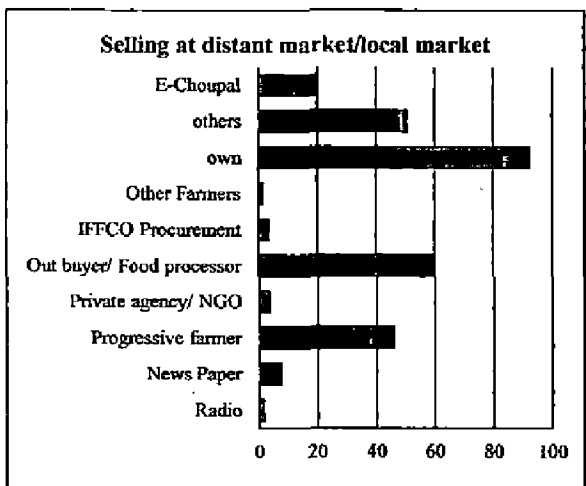
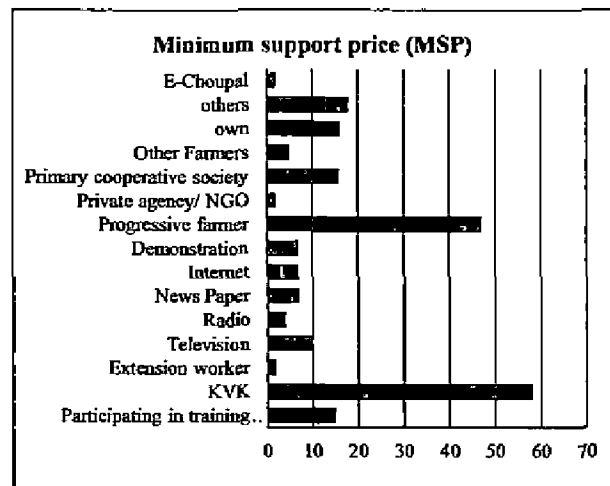
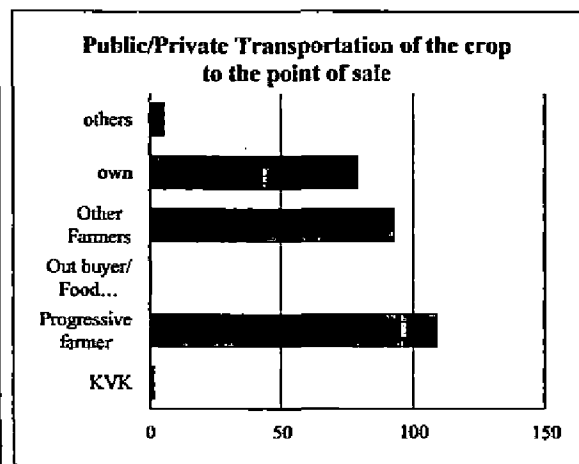
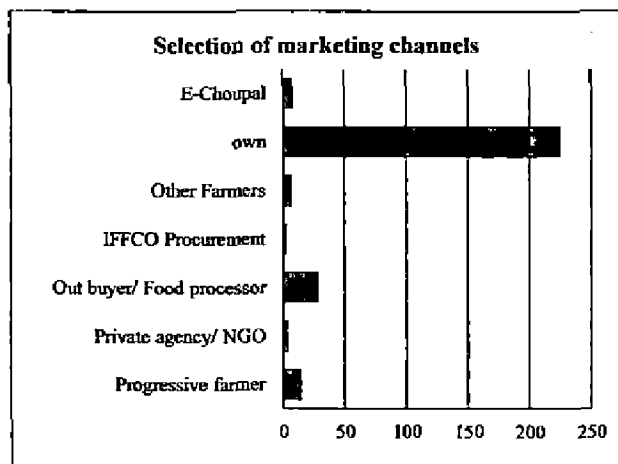
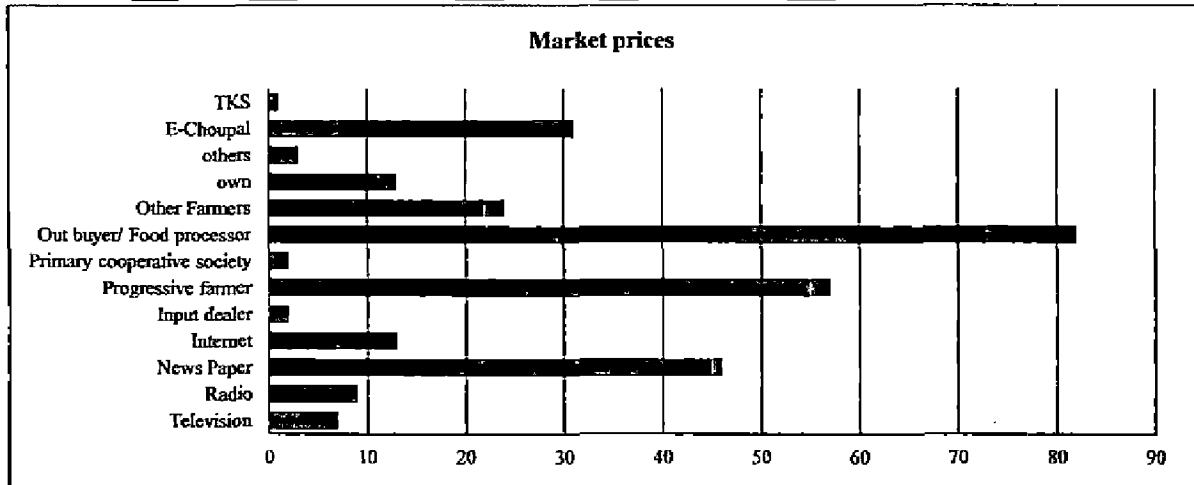
very poor [white] poor [light gray] satisfactory [medium gray] good [dark gray] very good [black]



Source: Field Survey

Figure 7.5: Quality Responses by Sources for Marketing & Distribution Decisions

very poor ■ poor ■ satisfactory ■ good ■ very good ■



Source: Field Survey

It was found that marketing information was collected at most by interpersonal methods of information dissemination. However farmers also accessed newspaper of poor quality. In Figure 7.5 most of the information sources such as “newspaper, progressive farmers, other farmers and own” provided poor quality of information to its users. The above analysis showed that farmers were in the state of under resourced in selling their produce to the market.

Figure 7.5 showed that farmers adopted the source ‘own’ to sell the produce at local and distant market whereas a less number of farmers contacted the sources like ‘output buyer and food processor’. Television, radio and internet provided ‘satisfactory’ and ‘good’ quality of marketing information to the respondents. It may be due to updated and real time informative nature of these sources. Agribusiness models like e-choupal had emerged as the most reliable source in delivery of market information.

The study suggests the integrated use of these sources to change the outlook of most of the farmers by improving marketing prices’ information and other needs. As perceived from Figure 7.5, out of total sample of 290 respondents about 225 respondents relied on their ‘own’ channels. By identifying proper marketing channels, farmers can get the reasonable price for their produce. The study suggests that the scope of buying agencies such as IFFCO procurement, cooperatives, e-choupal buyer etc. should be expanded to mass level. In this way the layer of middle men could be reduced. Respondents made most of the transactions by personal arrangements. The study implicates the government to facilitate transactional/ financial infrastructure to overcome the financial shortage.