

## CHAPTER 5

### FACTORS AND CONSTRAINTS AFFECTING ADOPTION OF NEW AGRICULTURAL TECHNOLOGY

#### 5.1 Introduction

This chapter was based on farm level data collected personally from 12 villages of 6 Development Blocks of Barpeta District of Assam. The data were collected through a questionnaire prepared in consultation with the supervisor of the study. The data were relating to the households of different size group of farmers namely large, medium and small farmers of both non-tribal and tribal category. The distribution of adopter households is not uniform across the size groups of farm households. It was observed from field survey that there are some factors which are mainly responsible for the adoption of new technology in agriculture.

These factors are:

1. There is a positive relation between farm size and adoption of agricultural technology. The greater the size of farm the higher is the adoption rate of new agricultural technology.
2. Income of the farmer is the main factor affecting the adoption of new agricultural technology. It is an important decision making factor in relation to adoption or non-adoption of new technology in agriculture. Income of the farmers is positively correlated to the adoption of new technology for all groups of farmers.
3. It was observed from field investigation that risk bearing ability of the farmers is an important factor for the adoption of new technology in agriculture.
4. Irrigation facility is an important factor for the adoption of new technology in agriculture. Most of the sample farmers particularly non-tribal farmers reported that lack of adequate and timely supply of assured water is the main

obstacle in adoption of modern agricultural technology.

5. Field survey showed that use of fertilizer especially chemical fertilizers (NPK) is extremely essential for adoption of HYV seed which constitutes an important part of modern agricultural technology. Therefore, fertilizer is an important factor affecting adoption of modern technology in agriculture.
6. Credit facility, particularly institutional credit facility also affects the adoption pattern of agricultural technology by the farmers. Farmers who got credit facility were found to be more responsive to the adoption of improved agricultural technology.
7. Education level of the respondents was found to be positively related to the adoption of modern technology. It was found that respondents who are office holders or learned persons are more responsive towards the adoption of new technology since they have direct contact with extension workers and development agencies at block offices.
8. Field study made it clear that market price of agricultural produce is an important factor affecting adoption of new technology in agriculture. Higher price encourages farmers to adopt improved technology in agriculture for higher production. Many respondents reported that prices of agricultural produce like vegetables, jute, rice etc. go down to a considerable extent particularly during the harvesting season. Low price of agricultural produce discourages the farmers from adopting costly new technology.
9. The study revealed that the middle age farmers (between 30 and 40) are more responsive to the adoption of improved agricultural practices.
10. Source of acquiring new knowledge or information about agricultural technologies and their cost effectiveness are also important factors affecting technology adoption. Most of the farmers particularly tribal farmers are unaware of many programmes sponsored by the govt. to promote adoption of improved technologies because of source of acquiring new knowledge or information regarding agricultural activities are either insufficient or non-existent.

11. Traditionalism and castism also play an important role in affecting the adoption pattern of agricultural technology by the farmers. Tribal farmers being more tradition ridden and conservative are found to be less responsive towards the adoption of new agricultural technology.

## **5.2 Constraints to Adoption of New Technology in Agriculture in the District of Barpeta**

Transfer of technology plays a vital role in the process of agricultural development. Transformation necessitates that farmers should be convinced to accept and work for the change. They need to be prepared mentally and emotionally to accept the new agricultural technology with the continuous effort of the government and other extension agencies. Most of the farmers are well informed about the new development in agriculture and they are ready to adopt the new farming technology but are not in a position to adopt the improved technology at full scale due to certain constraints faced by them in day to day life.

In order to find out various constraints of different size group of farmers in the present study, open-ended questions were asked. The constraints mentioned by them (both non-tribal and tribal respondent farmers) were noted which can be classified into the following groups:

- (1) Economic constraints
- (2) Input constraints
- (3) Guidance and training constraints
- (4) General constraints

1. Economic constraints comprises the following items:

- a) Lack of own capital
- b) Inadequate institutional credit
- c) High rate of interest of non-institutional credit
- d) Lack of collateral of farmers and complex procedure in obtaining credit

2. Input constraints comprises the following items:

- a) Impurity of seeds
- b) High cost of HYV seeds
- c) High cost of fertilizers
- d) Inadequate irrigation facilities
- e) High rate of irrigation charge of private pumping sets
- f) Erratic supply of electricity
- g) Insufficient availability of effective and pure chemicals, pesticides, insecticides etc.

3. Guidance and Training constraints consists of the following items:

- a) Lack of information about new technology
- b) Lesser contact with extension agencies
- c) Lack of knowledge of various development programmes to uplift the poor farmers

4. General constraints comprise the following issues:

- a) Low price of agricultural produce
- b) More proneness of HYV seeds to diseases
- c) Lack of cold storage
- d) Transport problem
- e) Problem of regulated market
- f) Lack of education
- g) Problems of soil testing, water testing, soil salinity etc.
- h) Environmental problem

Among the economic constraints, lack of capital counts the most. Since majority of the farmers are poor, they have not internal sources of their own to purchase the entire or any of the components of new agricultural technology. It is mainly responsible for their low income which does not permit them to adopt more remunerative agricultural technology. As many as 12 large, 30 medium and 60 small

farmers reported about lack of own capital for which they could not adopt new agricultural technology at full scale.

Since many farmers do not have their own capital for adoption of new agricultural technology, they have to depend on borrowed capital. Since non-institutional sources of capital are insufficient and bear exorbitant rates of interest, farmers have to depend on institutional credit. But field survey showed that only 65 (81 percent) of large farmers out of 80, 58 (73 percent) medium farmers out of 80 and 42 (53 percent) small farmers out of 80 had access to institutional credit. So, 19 percent large farmers, 27 percent medium farmers and 47 percent small farmers reported credit constraints. The main reason of this inadequacy of bank credit, as reported by sample farmers, is their lack of collateral due to their poor asset base and complex loaning procedure. Most of the farmers, being poorly educated, do not know the procedure of borrowing from nationalized banks. The main problem, therefore, is to evolve a suitable agricultural credit system so that credit is made available to the farmers on easy terms at reasonable rate of interest and without rigorous requirement of security and without irksome formalities. Non-institutional credit sources charge high interest rate. As many as 6 percent large, 30 percent medium and 43 percent small farmers reported about high rate of interest charged by village money lenders and rich men. So far as input problems are concerned, out of 240 sample farmers, 17(i.e., 7 percent) large farmers, 18(i.e., 8 percent) medium farmers and 23(i.e., 10 percent) small farmers reported that many high yielding variety seeds are not pure and very often taking the advantage of ignorance and illiteracy of farmers, many unscrupulous business men sell impure seeds of high yielding varieties at high prices. As many as 32(13 percent) large farmers, 35 (15 percent) medium farmers and as high as 50(21 percent) small farmers reported about high prices of HYV seeds.

During the field survey, it was found that big farmers were possessing more pump sets to irrigate their fields. Some of large and even medium farmers hire out their pump sets to irrigate the fields of their neighbouring small and medium farmers, who do not possess pump sets, at a quite high rental. As many as 6(8

percent) large, 20(25 percent) medium and 43(54 percent) small farmers reported about high charge of pump sets. It was also found, during field investigation, that the supply of irrigation water by govt. scheme is not sufficient and convenient for the beneficiary farmers. This is mostly because of erratic supply of electricity. The shortage of power prevented the govt. tube wells from functioning properly. A sizeable number of farmers, i.e., 12 (15 percent) large, 15(19 percent) medium and 21(26 percent) small farmers complained that the chemicals they purchase from market are not pure and effective. So, the chemicals and pesticides, they reported, are not fully effective in protecting their crops from pests and diseases. As regards fertilizer input which is the most important component of new farming technology, as many as 25 (31 percent ) large, 33(41 percent) medium and 65(81 percent) small farmers reported about high price of fertilizer. Due to high price of some fertilizers, many sample farmers could not afford to purchase recommended doze of fertilizers.

As regards the guidance and training constraints, many farmers, especially small and illiterate farmers of non-tribal category and most of the farmers of tribal category complained about lack of information relating to new technology. As many as 30(38 percent) large, 36(45 percent) medium and 57(71 percent) small farmers reported about the lack of information regarding new agricultural technology. Lesser contact with extension workers and lack of knowledge of various development programmes which are meant for the upliftment of the poor farmers also stand on the way of adoption of new technology in agriculture. It was complained by many farmers (particularly tribal farmers) that block officials do not disseminate the necessary information to them regarding the latest improved agricultural practices for which they can not adopt new practices in due time.

As far as the question of general constraints are concerned, out of 240 sample farmers as many as 70(29 percent) large, 61(25 percent) medium and 20(8 percent) small farmers reported about low price of high yielding variety produce. During field survey, many farmers, specially producing marketable surplus, reported that almost every bumper production is followed by lower price and many time particularly during the harvesting season they have to make distress sale.

About 50 percent of the sample farmers, i.e., 48(20 percent) large, 49 (20 percent) medium and 21(9 percent) small farmers expressed that high yielding varieties are more prone to diseases. Similarly 156 sample respondents, i.e., 70 large, 61 medium and 20 small farmers felt the need of cold storage. Field survey showed that more than 80 percent roads are unmetalled and most of them become muddy and unsuitable for transportation of agricultural produce during the entire rainy season. Most of the farmers in the study villages use handcart, van rickshaw, bullock carts etc. as means of transportation of agricultural produce and input. Out of 240 sample farmers, 26(11 percent) large, 25(10 percent) medium and 15(6 percent) small farmers reported about inadequate number of regulated markets to sell their surplus output to and purchase required input there from. Due to lack of adequate number of regulated markets, price of most of the agricultural produce go down during the harvesting season. Due to unremunerative prices, income of the farmers cannot increase reasonably which obviously discourage them to adopt new agricultural innovations. There are about 75, 80 and 92.5 percent of large, medium and small farmers respectively who face the problems relating to test of soil, water and soil salinity.

Besides the above constraints, there are some other constraints which also deserve mentioning. Among them are more proneness of HYV seeds to diseases, problem of skilled labour, lack of education, lack of cold storage, transport problem, problem of regulated market etc.

Some farmers reported about environment problem and ecological imbalances caused by excessive use of chemical fertilizers, pesticides etc. Some educated farmers reported that excessive use of pesticides and insecticides for plant protection measures cause environmental degradation. For example, they mentioned that due to the excessive use of these chemical inputs, some pet animals like cows, goats etc. are affected and even sometimes many useful living beings like frogs, fishes, earthworm etc. which are natural protector of crops die due to the poisonous effect of the chemicals used. Excessive and non-judicious use of plant protection chemicals has not only resulted in environmental pollution but also developed

resistance to several pests. Residues of DDT, aldrine, lindane etc. have been found in different food samples which are harmful to health. Moreover, increase in the use of chemical fertilizers and water for increasing agricultural yield bring about a steady depletion of micronutrients from the soil, erosion of topsoil, spread of salinity and water-logging etc. Imbalances in nutrient status leads to significant deficiency of N.P.K., Zn, S and disturbance of soil texture and its physico chemical properties.

Environmental degradation like depletion of stratospheric ozone, nitrate toxications etc. are causing health hazards like cancer, methamoglobinemia, respiratory illness, hypertension etc. (Bhattacharya and Bihari (2003). As many as 19 (8 percent) large, 20(8 percent) medium and 11(5 percent) small farmers reported about ecological imbalances.

On the basis of the results of present investigation some constraints like lack of capital, low price of agricultural produce, problem of insufficient cold storage, inadequate institutional credit, problem of soil and water testing facility, inadequate irrigation facility, high cost of fertilizers, high rental charges of implements and machines, lack of information and problem of regulated market are most important and mainly due to these constraints that the process of adoption of new agricultural technology in Barpeta district has been slow and interrupted.

The important constraints to adoption of technology in agriculture can be summarized in a tabular form as follows:



**Table 5.1 Constraints to Adoption of New Technology in Agriculture in the District of Barpeta**

Constraints	Large farmers N=80		Medium farmers N=80		Small farmers N=80		Total
	Frequ ency	Percen tage	Frequ ency	Percen tage	Frequ ency	Percen tage	
1. Economic constraints							
a) Lack of own capital	12	15.00	30	37.5	61	76.25	103
b) Lack of Institutional credit	33	41.25	42	77.5	58	85.00	185
c) High rate of interest of non- institutional credit	5	6.25	22	27.5	34	42.5	61
d) Lack of collateral of farmers and complex procedure in obtaining credit	13	16.25	28	35.00	32	40.00	73
2. Input constraints							
a) Impurity of seeds	17	21.25	18	22.5	23	28.75	58
b) High cost o HYV seeds	32	40.00	35	43.75	50	62.5	117
c) High cost of fertilizers	25	31.25	35	43.75	65	81.25	125
d) Inadequate irrigation facility	7	8.75	22	27.5	36	45.00	65
e) High rates of irrigation charges of private pumping sets	6	7.5	20	25.00	43	53.75	69
f) Erratic supply of electricity	3	3.75	Not menti oned.	-	Not menti oned.	-	3
g) Inadequate availability of pure chemicals, pesticides, insecticides etc.	12	15.00	15	18.75	21	26.25	48
3. Guidance and training constraints							
a) Lack of information about new technology	30	37.5	36	45.00	57	71.25	123

b) Lesser contact with govt. extension agencies	67	83.75	27	33.75	80	100.00	174
c) Lack of knowledge of various development programmes	30	37.5	50	62.5	61	76.25	141
<b>4. General constraints</b>							
a) Low price of agricultural produce	70	87.5	61	76.25	20	25.00	151
b) More proneness of HYV seeds to disease	48	60.00	49	61.25	21	26.25	118
c) Lack of cold storage	70	87.5	61	76.25	25	31.25	156
d) Transport problem	52	65.00	50	62.25	46	57.5	148
e) Problem of regulated market	26	32.5	25	31.25	15	18.75	66
f) Lack of education	41	51.25	46	57.5	49	61.25	136
g) Problem of soil testing, water testing etc.	60	75.00	64	80.00	74	92.5	200
h) Environment problem	19	23.75	20	25.00	11	13.75	50

Source: Field Survey, 2004

### **5.3 A Special Constraint: Fluctuating Market Price of Agricultural Produce and Market Conditions**

Market price of agricultural produce plays a crucial role in the agricultural development of a country. It is an important instrument for providing incentives for farmers for motivating them to go in for production oriented investment and technology. In a developing country like India where majority of the population is engaged in agricultural sector, prices affect incomes, consumption and investment decisions of the farmers. Basically agricultural prices strongly work as economic incentives that guide farmers in making production decision and to reward according to its allocative efficiency.

But prices of agricultural produce have been found to be violently fluctuating. And fluctuations in agricultural prices have many harmful results. For instance, a steep decline in the price of a particular crop in a year can inflict heavy

losses on the grower of that crop. This will reduce income of the grower of that crop and dampen the spirit to cultivate the crop in the coming year. On the other hand, steep rise in the price of a particular crop can raise the income of the grower of that crop and induce him to invest and grow more of that in the coming year. Therefore, price fluctuation of agricultural produce influence to a great extent on the volume of agricultural production in a country. Therefore, price increase has positive impact and price decrease has negative impact on the production of agricultural commodities.

Agriculture produces food-stuffs and raw materials, the demand for which in the aggregate, is relatively stable in the short run, while the supply of agricultural products fluctuates widely from year to year, and from one part of the year to another, on account of the variations in yields, due to

- (i) seasonal and weather conditions,
- (ii) variations due to supplies being more abundant in certain months of the year,
- (iii) deliberate variations attempted by the producer, and
- (iv) variations arising out of conditions of marketing.

These fluctuating supplies constitute the most important factor responsible for the wide fluctuation in agricultural prices. These fluctuations in the price of agricultural products are the greatest hurdle in the way of agricultural development, for they bring ruin to many. It was for this reason that agricultural countries suffered during the depression of 1929. According to Sir Roger Thomas, “next to rain, price changes have been the greatest enemy of the farmer.”

In Barpeta district apart from cereal crops, the sample farmers also cultivate vegetable crops during Rabi and Kharif season. They cultivate cabbage, cauliflower, tomato, potato, brinjal and some leafy vegetables in Rabi season and ridge gourd, lady’s finger and cowpea etc. in Kharif season. Field investigation also showed that the cropping pattern in the district is gradually shifting towards vegetable cultivation since it is more remunerative than field crops- rice, wheat, jute etc.

The comparative analysis of costs involved in paddy and vegetable crop

cultivation by the sample farmers showed that the cost involved in vegetable crop cultivation is much higher than the paddy cultivation. It is found that per hectare cost involved in seeds of vegetable cultivation is Rs. 4,404.61 while cost involved in paddy seed is Rs. 415.24 (Assam Agricultural University, Jorhat, Deptt. of Agriculture, Barpeta 2004). The consumption of chemical fertilizer per hectare in vegetable cultivation is 84.02 Kg, which is found to be 105.23 percent higher than paddy (40.94 Kg/Ha) cultivation, It is also found that per hectare cost of cultivation of vegetables are much higher than cereal crops. The total costs involved in vegetable crop cultivation is found at Rs. 31,253.94/Ha, while it is Rs. 14,708.88 per hectare in paddy cultivation. The overall investment in vegetable crop cultivation is higher by 112.52 percent than the paddy crop cultivation. The value of output per hectare on vegetables is estimated at Rs. 72,529.45 while the per hectare return from paddy is only Rs. 18,180.53.

The above analysis sufficiently establishes that the vegetable crops cultivation is more remunerative than the paddy cultivation in the study area. There are also scopes of enhancing per unit of area by adoption of new farm technology in vegetable crop cultivation provided that their prices are remunerative. With the advent of new agricultural technology, agricultural sector has started shifting from subsistence farming to commercial enterprise. Under such circumstances, stable and remunerative prices of agricultural produce is very much essential for the sustainable development of agricultural sector as commercial enterprise. But field investigation, interaction with market functionaries and government records showed that prices of most of the agricultural products fluctuate vigorously. It was also found, through field investigation, that the intensity of the price fluctuation varies from crop to crop, from place to place and also from time to time depending upon the nature of supply, nature of demand and also the condition of roadways meant for transportation of agricultural commodities to different markets. Though prices of agricultural products have been found varying throughout the years, price variation is found to be more pronounced in different seasons in a particular year which have disincentive effect on farmers. During the last couple of years, price changes particularly fall in

price has become the main concern for the farmers. This phenomenon acts as a deterrent to the adoption of new technology for improving agricultural production and productivity.

Therefore, during field investigation, an attempt was made to find out the intensity of price variation of different important agricultural commodities (both cereal and vegetable crops) in Barpeta district. Table 5.2 shows the price variation of different important commodities in different seasons in 2004.

**Table 5.2 Price Variation of Different Important Agricultural Commodities in Different Seasons, 2004**

Sl. No.	Name of the crops	Price of commodities in different seasons (in Rs.)		
		Early season	Peak season	Late season
	<b>Field crops</b>			
1.	Rice (Per Qtl.)	600	500	550
2.	Jute (Per Qtl.)	875	1200	1500
	<b>Vegetable crops</b>			
4.	Cabbage (Per Qtl.)	1000	400	100
5.	Cauliflower „	1700	500	150
6.	Tomato „	1800	200	400
7.	Potato „	800	300	450
8.	Brinjal „	1500	400	400

Source: (i) Barpeta Road Market Committee, 2004  
(ii) District Agricultural Office, Barpeta

A close look at the Table makes it clear that almost all the crops except jute experienced higher prices during early season. But only a few sample farmers, i.e., as low as 21(9 percent) out of 240 farmers, reported to have benefited by higher prices in early season. It is the peak season when almost all the farmers have generally maximum harvest and marketable surplus. But the Table shows that prices of almost all the crops declines to the minimum during the peak/harvesting season causing losses to farmers. The decline was more pronounced in case of vegetable crops than cereal crops. For example, prices of cauliflower and tomato were Rs. 1700/- and 1800/- respectively in early season which declined to Rs. 500/- and 200/-

in main harvesting season. So was the condition in case of cabbage and brinjal also. During field investigation, some farmers reported they had to sell their products, particularly vegetable products, at such a minimum price which could just make up the transport cost. Price fluctuations of agricultural products have become a regular feature during the last couple of years. It is seen that every bumper harvest is followed by low price. Under such situation farmers cannot make afford to increase production by bringing more and more area under high yielding technology. Besides, the district of Barpeta is more or less a rain fed area and water-logging is a common feature for vast area in the district. Under such agro-climatic condition, early cultivation of both cereal and vegetable crops are subject to vagaries of rains and water-logging. Many times, as was reported by some sample farmers, it happens that crops in the fields are either washed away or damaged by floods and rains and under such circumstances, many farmers become unable to withstand the losses caused by the rains and floods. Therefore, early cultivation for all the time is neither a sustainable exercise nor a profitable proposition. Farmers with only comparatively large amount of culturable land can take up early cultivation with minimum risk.

Apart from low price, farmers are very often deprived of getting the deserving share of consumer's rupee due to existence of large number of marketing channels.

#### **5.4 Share of Growers in Consumer's Rupee**

Marketing of agricultural commodities involves a number of marketing functions like purchasing, assembling, cleaning and grading, packaging, transportation, storing and dispersion. In the process of marketing, a number of market functionaries like middlemen, wholesalers, retailers, etc. are involved and operated in different marketing channels.

##### **5.4.1 Market Channels**

The marketing channels of agricultural commodities (both cereal and vegetable crops) varies from crop to crop and place to place. The identified market channels for major agricultural crops in the study area are as follows:

- Channel-1: Producer-Retailer-Consumer,
- Channel-2: Producer-Middlemen-Retailer-Consumer,
- Channel-3: Producer-Middlemen-Wholesale- Retailer-Consumer,
- Channel-4: Producer-Jute Corporation of India (J.C.I.)
- Channel-5: Producer-Middlemen- Jute Corporation of India
- Channel-6: Producer-Commission Agent-Kutchha baler-Terminal market wholesaler

The market functionaries operate in different styles at different times. Actually there is no fixed channel through which agricultural products find their ways to the final consumers. The marketing channel varies depending upon the types of products produced by the farmers. But existence of various market channels provide ample scope for price spread.

#### **5.4.2 Price Spread**

The analysis of price spread revealed that there is a wide gap between the price received by the producer and the price paid by the consumer. The price spread for agricultural products varied depending upon the volume of production, road communication network and marketing facilities.

#### **5.4.3 Price spread of some major crops in Barpeta district**

During investigation, it was found that the larger the number of marketing channel that operates in the market the higher is possibility of price spread. Again if more is the price spread, the producers get lesser amount of consumer's rupee.

#### **5.4.4 Price spread of Rice**

Rice grower share of consumer's rupee was found at 70.42 percent in Channel-1, 64.40 percent in Channel-2 and 61.00 percent in Channel-3. The analysis of spread revealed that growers share in Channel-1 is higher than the Channel-2 and Channel-3.

#### **5.4.5 Price spread of Jute**

The share of jute growers in Jute Miller's rupee was also found to depend on the nature of market channel. The share of growers was worked out at 59.20 percent in Channel-4, 53.50 percent in Channel-5 and 50.00 percent in Channel-6 (Sri Manik Chand Agarwal, Market wholesaler who supplied raw jute directly to Millers at Calcutta, 2004)

#### **5.4.6 Price spread of Cabbage**

The producer share of consumer's rupee was estimated at 48.00 percent in Channel-1, 43.33 in Channel-2 and 43.00 percent in Channel-3. It appeared from analysis of price spread that in Channel-1 the producers were enjoying comparatively higher share of consumer's rupee than that of Channel-2 and Channel-3.

#### **5.4.7 Price spread of Potato**

The share of potato producer of consumer's rupee was estimated at 56.40 percent in Channel-1, 50.00 percent in Channel-2 and 50.00 percent in Channel-3. The share of producer in consumer's rupee was found to be higher in Channel -1 than Channel-2 and Channel-3.

It was observed that the crop's growers especially vegetable growers nearby the marketing centers or towns availed the facility of forwarding their produces directly to the retailers. The retailers also used to collect the produces from the growers field. The transportation costs and other expenditures are also low for which the retail buyers could pay higher prices to the growers. The retailers also enjoyed more than 40.00 percent of consumer's rupee in Channel-1. In Channel-2, 3 and 6, middlemen are involved, transportation and other miscellaneous charges are there. Therefore, the buyers from the producers usually offer lower prices and the retailer's margin of consumer's rupee also dropped substantially.

Apart from price fluctuation and price spread as mentioned above, underdeveloped road communication network also cause economic hardship for cultivators. Agricultural commodities meant for sale require well-developed roads



for transportation to different market places. In Barpeta district, more than 103 markets are operating in town and rural areas. Out of these 103 markets, only 4 market, i.e., Barpeta, Barpeta Road, Howly and Bohorihat markets are regulated and these are linked by pucca roads. All other 99 markets are non-regulated and are connected by kutchra roads. These are basically rural markets. (A list of markets in Barpeta district is given in the Appendix VII). Most of these markets are connected by kutchra and fair weather roads. Such roads are not usable for motor transport for carrying of harvested crops. Most of these rural roads become almost unusable during the rainy season. But the entire production of agricultural commodities in Barpeta district pass through these rural markets and ultimately reach the hands of the consumers through different agencies engaged in trade. But due to poor conditions of roads, a majority of farmers use handcart to carry their produce to different markets. As much as 201 sample farmers reported about kutchra roads in their areas. They also reported that transportation cost is very high due to undeveloped road communication. Sometimes, due to bad road condition, some agricultural commodities particularly perishable commodities like vegetables, fruits, milk, fish etc. get damaged or quality deteriorates. Perishable commodities require quick transportation to market places for sale which necessitates well developed road communication network. According to an estimate about 30 percent of agricultural produces are carried on head by the producers and this is due to poor communication condition. As per the report of Agricultural office, Barpeta, on an average about 10-15 percent of the agricultural prices offered by traders is to be spent as transport cost. This certainly reduces the producer's share in agricultural price.

Under such circumstances, farmers find it unremunerative to adopt costly modern agricultural technology. As many as 125 sample farmers mentioned low price of their marketable surplus as constraints to adoption of new technology.