

## **ABSTRACT**

The study entitled “A study on the technology adoption and productivity in rainfed farming systems in lower Brahmaputra Valley Zone of Assam” was conducted in Barpeta and Kamrup districts of Assam with the following objectives :

1. To identify different types of specific enterprise based farming systems in the study area across different size group of farms.
2. To assess the level of adoption of selected agricultural technologies and level of productivity in selected farming systems across different size group of farms.
3. To identify the variables which significantly contribute towards the level of adoption of selected agricultural technologies and level of productivity in selected farming systems across different size group of farms.
4. To determine the direct and indirect effects of selected variables on level of adoption of selected agricultural technologies and level of productivity in selected farming systems.
5. To find out farmers' perceptions of factors hindering adoption of improved agricultural technologies in selected farming system across different size group of farms.

A multistage purposive-cum-random sampling design was followed for selection of respondents. The sample of the study consisted of 208 farmers practicing rainfed farming. The data were collected with the help of a pre-tested structured schedule by personal interview method.

The two dependent variables included in the study were level of adoption of agricultural technology and level of productivity. All together twenty-one independent variables were included in the study.

The frequencies, percentage, arithmetic mean, standard deviation, coefficient of variation, zero order correlation coefficient, multiple regression analysis and interpretation of the data.

Findings revealed that 47.12 per cent of the respondents were marginal farmers, followed by 31.25 per cent small and 21.63 per cent medium farmers. While majority (60.20%) of the marginal farmers had low farm mechanisation, 49.23 per cent of small and majority (68.89%) of medium farmers had medium level of farm mechanisation. Majority of the respondents had medium cropping intensity (68.27%), medium degree of

commercialization (66.35%), medium utilization of family labour (69.71%) and medium level of working capital availability (70.19%). Majority of the respondents were middle aged (50.96%), and illiterate (49.52%) with single type (75.48%) but large size (68.27%) family. Around half (49.08%) of them had membership in one organization. Majority of the respondents had low innovation proneness (51.44%), medium economic motivation (70.19%), low scientific orientation (44.71%), medium risk orientation (67.79%), medium level of aspiration (54.80%), medium orientation towards competition (69.71%) and medium management orientation (57.21%). While 37.76 per cent of marginal farmers had less favourable attitude, 40.00 per cent of small and 44.44 per cent of medium farmers had moderately favourable attitude towards improved farm practices. Majority of the respondents had medium level of knowledge on agricultural technology (74.52%) and medium degree of information exposure (78.85%).

All the sampled farmers practised crop based farming system. All together 18 different types of crop based farming systems were identified among three size group of farms. Out of these 14 were common in three size group of farms. Highest percentage (19.71%) practised the system crop-dairy-goat-fish-duck followed by 16.82 per cent respondents with the system crop-dairy-fish-duck-pigeon. In all the farming systems, crop enterprise had the highest contribution towards the total gross margin.

More than 60.00 per cent of the respondents in each of the three farm size groups were adopters of high yielding variety seeds in *sali* and *ahu* rice and adopters of chemical fertilizers in *sali* rice, *ahu* rice and potato crop. Highest percentage of the respondents (39.90%) were adopters of chemical pesticides in mustard crop. As regards level of adoption, majority of the sampled farmers had medium level of adoption of high yielding variety seeds (68.75%) and chemical fertilizers (69.71%). While majority (63.27%) of the marginal farmers and 46.15 per cent of small farmers had low level of adoption of chemical pesticides, 48.89 per cent of medium farmers had medium level of adoption of chemical pesticides. The overall adoption scores revealed that while 44.90 per cent of the marginal farmers had low level of adoption, 40.00 per cent each of the small and medium farmers had medium level of adoption of three selected agricultural technologies. The highest overall mean adoption score (42.69%) was obtained for medium farmers.

As regards level of productivity, findings revealed that while majority of the marginal (73.47%) and small (70.77%) farmers had medium level of total gross margin, majority (53.33%) of the medium farmers had high level of total gross margin per annum. The highest average total gross margin was obtained from the system crop-dairy-fish-duck-pigeon. Out of the 21 independent variables, 13, 17 and 16 independent variables had positive significant correlation with level of adoption of marginal, small and medium farmers

respectively. In the pooled sample, 17 independent variables had positive significant correlation with level of adoption. Of these knowledge level on agricultural technology ( $r = 0.661$ ), working capital availability ( $r = 0.645$ ), economic motivation ( $r = 0.592$ ), attitude ( $r = 0.563$ ), degree of information exposure ( $r = 0.561$ ), and degree of commercialization ( $r = 0.521$ ) had moderately strong correlation with level of adoption.

While 13 independent variables had positive significant correlation with level of productivity of marginal farmers, 17 independent variables had positive significant correlation with level of productivity of both small and medium farmers. In the pooled sample 18 independent variables had positive significant correlation with level of productivity. Of these, economic motivation ( $r = 0.720$ ), level of aspiration ( $r = 0.692$ ), orientation towards competition ( $r = 0.660$ ), cropping intensity ( $r = 0.643$ ), working capital availability ( $r = 0.598$ ), knowledge level ( $r = 0.562$ ), and attitude ( $r = 0.505$ ) had a moderately strong to strong correlation with level of productivity.

The variables knowledge level had the highest positive significant contribution towards the level of marginal farmers, followed by the variables working capital availability and attitude. As regards small farmers, the variable economic motivation had the highest positive significant contribution towards the level of adoption followed by the variables working capital availability and cropping intensity. As regards medium farmers, the variable knowledge level had the highest positive significant contribution towards the level of adoption followed by economic motivation and working capital availability. In the pooled sample, the variable knowledge level had the highest positive significant contribution towards the level of adoption followed by the variables working capital availability and economic motivation.

The variable knowledge level had the highest positive and substantial direct effect (0.267) on the level of adoption followed by the variables economic motivation (0.210) and working capital availability (0.206).

The variable orientation towards competition had the highest positive and significant direct effect (0.269) on the level of productivity followed by the variables level of aspiration (0.241) and cropping intensity (0.219).

'Lack of finance', 'non availability of high yielding variety seeds in time' and 'high cost of fertilizers and pesticides' were perceived by both the small and marginal farmers as three most important constraints in adoption of improved technology. 'Non availability of high yielding variety seeds in time', 'lack of irrigation facilities' and 'lack of knowledge about plant protection measures' were perceived by the medium farmers as three most important constraints in adoption of improved technology.