ABSTRACT OF Ph. D. THESES

Ahmed, A. U. 1988. A Study on Marketing of Paddy in Assam. G. B. Pant University of Agriculture and Technology. Pantnagar, Nainital. *Major Adviser* : V.P.S. Arora

Productivity of paddy in Assam as compared to some other paddy growing states in India is very low. One of the important causes of this situation is that the state of Assam is still lacking in market infrastructural facilities and that the government intervention in aid of farmers is at very low level. The main focus of the study are—marketed surplus of paddy and its farm level determinants; marketing pattern of paddy growers, marketing channels and functionaries; functions performed by growers as well as intermediaries; producer's share, margin of middlemen, price spread and the pricing efficincy.

Multi-stage stratified random sampling techniques were used for primary data collection. Regression analysis is done to examine the factors affecting marketed surplus. Market integration is measured by correlation coefficients among prices using secondary data.

The Highest ratio of market surplus to per farm production is observed in case of Darrang District (38.51 per cent) followed by Dibrugarh (33.62 per cent), Kamrup (29.39 per cent) and Sibsagar (22.00 per cent) districts. The quantity sold in peak period in the state is found to be very high which may be attributed to factors such as pre—harvest contract and other financial obligation, debts, large sales, decentraliza tion of selling and lack of market information. The per quintal average price received by the farmers for the state as a whole is Rs. 176.61. The average marketing cost incurred by growers is Rs. 2.26 per quintal. Size of operational holding, total production, irrigated area and pre-havest contract are found to be major factors affecting marketed surplus. Darrang district shows the highest net share to growers (74.01 per cent) in retail price spread. The degrees of vertical and horizontal integration estimated for various stages of marketing confirm the Hypothesis of poor efficiency in paddy marketing system in Assam.

Srivastava P. 1988. Analysis of Alternative Criteria for Irrigation Water Pricing. G.B. Pant University of Agriculture and Technology, Pantnagar, Nainital. *Major Adviser* : V.K. Sharma

The study was carried out to determine the irrigation charges using alternative

criteria and examine the impact of these charges on Government revenue and farmers' acceptability. The study was conducted in the Sharda Sahayak Command Area. Five alternative criteria, *viz.*, average total cost, average maintenance cost, marginal value productivity (calculated using two approaches, the production function and linear programming approach), net additional benefit due to per unit of water and equilibrium between demand and supply were considered in the study.

The study revealed that existing water charge (equilvalent to 5 paise per cu.m.) is quite low as compared to the charges calculated from different alternative criteria. The water charges computed on the basis of alternative criteria varied from 7 3 to 49 paise per cu m. The study suggested that the price of irrigation water may be fixed at the rate of 7.8 paise per cu.m. in the command area of Sharda Sahayak Project as (i) it will make the water use efficient by equating marginal return to marginal cost under existing resource availability and production conditions, (ii) it will clear the supply of water by equating demand and supply, (iii) it will take out only 17.7 per cent of the net gain accrued to the farmers due to irrigation and therefore, should be acceptable to the farmers, and (iv) it will increase the government revenue from irrigation by 156 per cent.

Singh, M. 1988. Instability Analysis of Cereal Production during Pre green and Green Revolution Periods in Uttar Pradesh. G.B. Pant University of Agriculture and Technology, Pantnagar, Nanital. *Major Adviser* : L.R. Singh.

This study is undertaken to empirically examine whether there is increased output instability of cereal production in U.P. as a whole during green revolution era and what were the factors responsible for bringing about the changes in output instability. The study pertains to five major cereal crops *viz.*, wheat, rice, jowar, bajra and maize and covers the period of 36 years, *i.e.*, from 1948-49 to 1983-84.

An examination of components of change in average production of different cereal crops showed that the increased production of wheat and of total cereal was contributed mainly by the increased mean area under the crop (s) in the second period while, the increased mean yield was primarily responsible in increasing production of rice and bajra crops in the second period. Increased variance of total cereal production was contributed substantially by increased production variance of wheat and rice crops. Increased covariances between crops and districts contributed maximum (63.35 per cent) to the increased variance of total cereal production of the State, while the increase inter-district coveriances contributed for 34.75 per cent.

The analysis of components of change in variance of total cereal production at the State leyel showed that the increased variances and covariances of yields

contributed maximum to the increased variance of total cereal production followed by interaction between change in mean yield and change in variance of yield.

The analysis of impact of various factors on crop yield variability indicated that for the State as a whole, variability in proportion of total cereal area under jowar and bajra crops positively affected their yield variability in the green revolution period. In case of wheat and rice, however, yield variability in green revolution period was influenced positively by the variability in proportion of crop area under irrigation.

The study indicated that measures towards reducing yield covariances and area yield covariances of the crops, both within and between districts could help in reducing cereal production variability in Uttar Pradesh. For achieving stability, an approach may be grouping of districts having similar environment into different clusters and then developing technology suitable to these clusters. Reducing variability in irrigated area under crops could also be a measure to reduce variability in cereal production.

Halim, R.A. 1989. Pattern of Employment and Income under Different Cropping Patterns—A Study in Jorhat, Nagaon and Goalpara Districts. Assam Agricultural University, Jorhat. *Major Adviser* : A. Saikia.

The present study attempts to highlight the pattern of employment and income under three major cropping patterns of Assam, *viz.*, (a) Rice-Rice, (b) Jute-Rice and (c) Rice-Wheat. The objectives of the study are, (i) to study the nature of employment in agriculture under different cropping patterns, (ii) to study the seasonal variation of employment in agriculture under different cropping patterns (iii) to study the nature of costs and farm income under different cropping patterns, (iv) to analyse the problems faced by the farmers in the adoption of double and multiple cropping patterns and in adoption of new technology in the cultivation of crops and (v) to suggest measures to raise the volume of employment and income in agriculture and to solve the problems of farmers in the adoption of double and multiple cropping patterns under new technology.

One block each from Jorhat, Nagaon and Goalpara districts to represent the three cropping patterns, rice-rice, jute-rice and rice-wheat was selected, respectively. A sample of 189 households were taken from these blocks following "stratified random sampling" procedure.

The annual average employment of workers in crop production was the highest at 92.95 mandays in jute-rice cropping pattern followed by 87.60 mandays in the rice-wheat and 66.49 mandays in rice-rice cropping pattern. The cropping intensity under different cropping patterns were observed to have a direct relationship to the

volume of employment. The annual average employment for female workers was found to be the highest in rice-rice cropping pattern (49-65 mandays). In rice-rice and rice-wheat cropping patterns, per hectare employment of workers tended to decrease with the increase in the size of holding while annual per farm employment of workers was found to have positive relationship with size of holdings. Operation-wise employment of workers indicates that preparatory tillage operation consumed the highest number of mandays annually in all cropping patterns. Cropwise annual average employment of workers in rice, jute and wheat were 67.46, 45.78 and 18.92 mandays, respectively. In rice-rice and jute-rice cropping pattern the busy seasons of farm activities were in the months of July-August and December while in rice-wheat cropping pattern employment of workers was found to be the highest in the months of August, May and March. The per hectare total cost of production of crops was the highest in jute-rice cropping pattern at Rs. 6087 followed by rice-wheat cropping pattern at Rs. 4886 and rice-rice at Rs. 4675. The gross income, farm business income and family labour income were the highest in rice-rice cropping pattern at Rs. 7993, Rs. 5158 and Rs. 3039 followed by jute-rice cropping pattern at Rs. 6772, Rs. 2989 and Rs. 1744 and Rs. 479, respectively. In rice-rice cropping pattern net income from crop production was Rs. 598 while in jute-rice and rice-wheat cropping pattern net income was found negative at cost C level. The study also identified lack of irrigation facilities, financial constraints in case of marginal and small farmers, inadequacy of credit facilities, lack of proper enclosures in the fields, non-availability of inputs in time and within easy reach of the farmers, lack of knowledge about the recommended technologies as the major constraints faced by the farmers in adopting double and multiple cropping and new technology. On the basis of the findings of the study it can be suggested that with adequate irrigation facilities and financial assistance, timely supply of improved inputs, etc. cropping intensity can be increased and level of adoption of new technology can be raised. This would generate more employment and income to the farmers. Measures for creating opportunities of non-farm employment in rural areas can be taken up on the basis of availability of raw materials and markets.

Biswas, P. 1989. Economic Evaluation of Various Criteria for Determining Premium Rates in Comprehensive Crop Insurance Scheme—A Case Study of Uttar Pradesh. G.B. Pant University of Agriculture and Technology, Pantnagar, Nainital. *Major Adviser* : Bhagwati Prasad.

The study was carried out to examine the distribution for time series data on yields of major crops in different regions of the Uttar Pradesh State and measure the extent of rich and expected indemnity therein to evaluate different criteria for determining premium rates and to determine effects of yield risk and level of indem-

nity on premium rates. One district from each administrative division was selected based on highest rainfall variation for the study.

The distribution pattern of yield of two different regions was first investigated. For this purpose Kolmogorov—Smirnov two sample test, Mann whiteney U test and Two sample Run test were used. All the three tests rejected the null hypothesis that the yields of a particular crop of two different regions have same distribution.

Thus it was argued that one premium rate for the entire state is not justified and separate premium rate for different region should be worked out. So the exact nature of distribution of the yield data were studied.

Normal and Exponential distributions were first fitted and their fit were tested through Kolmogorov—Smirnov one sample test. It was found that the yield series do not follow either normal or exponential distribution. Then Pearson system of equation were tried. It was observed that the crop yield of all the regions have followed Pearson Type I, IV and VI distribution. Methodology for calculating premium rate through Pearson distribution were developed and premium rate for all the selected crops for all the divisions were calculated. For comparison purpose premium rate were calculated by three method, *i.e.*, by (i) Normal Curve technique, (ii) Pandokar's technique, and, (iii) The technique developed for Pearson distributions. It was observed that the premium rate worked out on the basis of actual yield distribution are much below than those obtained from other method.

An evaluation of these new premium rates were done for the period 1975-76 to 1981-85. It was found that for rice and wheat crop the insurance agency may not have to pay any indemnity. But for maize, pulses and oil seeds it has to pay a considerable amount of subsidy though the total indemnity payable is much loss with this new rate than the present CCIS would have been paid. In the last objective it was found that yield variability and level of indemnity has direct impact on the rate of premium.

Dubey, A.K. 1989. Resource Productivity and Projection of Agricultural Production in Different Regions of Uttar Pradesh. G.B. Pant University of Agriculture and Technology, Pantnagar, Nainital. *Major Adviser* : L.R. Singh.

This study empirically examines the resource use efficiency in agriculture in different agro-climatic regions of U.P. *viz.*, Western, Central, Bundelkhand, Eastern and Hill, during the periods of 1966-67 to 1985-86. The efforts were also made to project the level of important factors having bearing on agricultural output so as to assess the level of agricultural production upto 2000-2001 A D.

The study demonstrates the existence of regional variation in land resource productivity. There was sub-optimal use of land resource in Western and Bundelkhand

Regions while the Hill Region reflected the inefficient use of this resource because the cultivation is extended to marginal and sub-marginal land even at steep slope. Land resource was used quite efficiently in Central and Eastern Regions. There was excess availability of bullock power for its use in agriculture in Western, Central and Eastern Regions. Fertilizer resource was not being used efficiently in Western and Eastern Regions and there appears to be poor management associated with the application of fertilizer resulting in low productivity of this resource. Projected agricultural output levels indicate increasing trend in the year 1998-91 to 2000-2001 A.D. in different regions as well as in Uttar Pradesh as a whole. At state level the agricultural output is likeiy to register about 22 per cent increase in the year 2000-2001 A.D. over the period of 1985-86.

Singh S. P., 1989. An Economic Analysis of Short Term Agricultural Credit Availed by Small and Marginal Farmers of Aligarh District, U.P. Indian Agricultural Research Institute, New Delhi. *Major Adviser* : Mruthyunjaya

The problems like, irrational lending procedures, inflation in transaction cost, diversion of production credit to the consumption purposes and mounting overdues, have to be overcome if agricultural credit has to play a significant role in increasing agricultural production particularly by marginal and small farmers who constitute the bulk of farming community in India. The solution to these problems have to be partly sought through the examination of utilization of availed credit by farmers.

The specific objectives of the study are (i) to examine the distribution of short term agricultural credit from different lending agencies (ii) to study purpose-wise utilization of short term agricultural credit (iii) to examine the relationship of short term farm investment (variable expenditure) with owned funds and credit (iv) to examine the effect of short term agricultural credit on crop production, employment and income generation and (v) to examine the repayment of short term agricultural credit. A primary level survey was conducted in district Aligarh (U.P.) involving personal interview of 150 rondomly selected farmers (92 from marginal and 58 small farm size group) of two blocks (three villages from each block). The study reveals that institutional sources met less than 50 per cent of the credit needs of the sample farmers. Marginal farmers were relatively more dependent on non-institutional sources, in both the blocks. It was found that, loans from Regional Rural Banks (RRB'S) were more costlier as compared to cooperatives. Cost of credit in RRB'S was almost equal to interest charge of non-institutional sources particularly in one of the study blocks. The credit was used towards manures and fertilizer followed by irrigation charges and seeds. It was observed that percentage diversion was slightly higher in case of marginal farmers as compared to small farmers. Both linear and Cobb Douglas type production functions were fitted.

Cobb-Douglus type function gave a better fit and hence selected for subsequent economic interpretation.

The adjusted coefficient of multiple determination varied from 45 percent in one block to 62 percent in another block with 52 percent for the combined analysis. A look at the F value of these functions indicated overall statistical significance. Results indicated that expenditure on manures and fertilizer followed by seed and irrigation exerted pressure on borrowed funds on the sample farms. Further it was observed that the important inputs which accounted for greater contribution to gross crop income were total human labour, irrigation expenditure, operational holding, expenditure on seed and expenditure on manures and fertilizer in that order. The returns to scale were computed and generally indicated constant returns to scale. The marginal value products (MVP) of variable input ranged from Rs. 0.048 for machinery to Rs. 3.965 for seed. It was observed that MVP of human labour, machinery and manures and fertilizer were higher on small farms as compared to marginal farms, whereas marginal value product of seed and irrigation were higher on marginal farmsas compared to small farms. The results indicated that for the sample as a whole, scope existed for increasing the gross crop income with higher level of use of resources of seed, irrigation and human labour as they were found to be used below their optimum rate. Further it was found that income from other sources and percentage credit utilization in crop production had negative influence on volume of current overdues. The size of loan had positive influence on volume of current overdues. Rationalization of loaning procedures, reduction in other expenses of extending credit, adequate supply of credit to buy crucial inputs and presanction scrutiny of loan and strict supervision on the use of credit are suggested.

Patil, H.K. 1989. An Economic Analysis of Agricultural Credit of Tribal and Non-Tribal Farmers in Thane District of Maharashtra State. Indian Agricultural Research Institute, New Delhi. *Major Adviser* : R.P. Singh

The main objectives of this study were to estimate the credit requirements at existing and recommended levels of technology, proportion of institutional finance in total borowing and cost of credit on tribal and non-tribal farms in Thane district of Maharastra. The study was based on the primary data of the year 1986-87 collected from 200 tribal and non-tribal farmers of different size groups.

Variations in resource endowments and utilization, especially of land and capital assets were found to exist among the different size groups and also between the tribal and non-tribal farms but large farmers in general and non-tribal in particular were better off. Paddy was the dominating crop in the area and the rate of HYV's adoption was higher on large size of both categeries of the farms. An inverse

relationship between costs and returns per hectare and size of farms was observed. Non-tribal farms were relatively more efficient in crop production.

The capital requirement at existing level of technology was higher on non-tribal farms, available capital being the difference between total capital requirement and credit borrowed, was less on tribal farms. The credit requirement at recommended level of technology was two to three times greater than that at existing level of technology on both tribal and non-tribal farms. The additional capital requirement in the form of short term credit would lead to higher rate of returns on tribal farms than on non-tribal farms.

The proportion of institutional credit supply was more on non-tribal farms. Hence the tribals' dependence on non-institutional sources of credit was relatively higher. Intensity of credit increased with decrease in farm size. The proportion of borrowed funds used for productive purposes increased with size of holding and was higher in case of non-tribal farms.

The rate of interest, a most important component of credit cost did not very much between tribal and non-tribal categories and among different size classes in case of institutional agencies, but varied widely in case of non-institutional agencies. Though the institutional credit was cheap due to lower interest rate, the non-interest charges on the procedural requirements and frequent trips to the agencies were significant. The study therefore strongly suggests that increasing capital requirement should be met by expanding the institutional credit network in order to enhance agricultural production and productivity on farms of the economically weaker sections, particularly tribal farmers.

Hiremath, G.K. 1990. Impact of Technical Change on Output, Income, Employment and Factor Shares in Indian Agriculture : A case study of Karnataka Bidi Tobacco Economy and its Problems : An Econometric Analysis. University of Agricultural Sciences, Dharwar, *Major adviser* : H G. Shankar Murthy.

The study attempts to examine the economic performance of different varieties of bidi tobacco produced in Belgaum district of Karnataka in terms of resource use efficiency and technical change, growth in output and employment, factor shares and investment in research by employing the profit function and decompcsition models. The price-cost ratio measuring the returns from investment in tobacco production was the highest for Anand-119 (Rs. 2.13) followed by Anand-2 (Rs 1.62) and S-20 (Rs. 1.37). There was a near optimum use of human labour in Anand-119 and manure in Anand-2. The use of land and fertilizer was above the optium level in all the three varieties. The total growth in output of Anand-2 over S-20 was 88 per cent, of

which the contribution due to technical change was around 72 per cent. The contribution of total inputs to output was of the order of 33 per cent. The yields of Anand-119 were higher by 176 per cent over that of S-20. Here the estimated technical change was around 90 per cent, while that from the changes in the level of inputs was around 64 per cent. The new seeds, fertilizer and labour were identified as the major sources of growth in tobacco output. The total benefits due to the new technology were around Rs. 72.5 million for Chikodi taluk and Rs 8 crores for Karnataka state. Technical change contributed 79 per cent of the increase in employment in Anand-2 over S-20 and it contributed only 11 per cent to employment in Anand-119 variety over S-20. The percentage change in absolute factor share was as high as 154 per cent for fertilizer followed by 78 per cent for land, 68 per cent for capital between S-20 and Anand-2 varieties. Similarly, between S-20 and Anand-119, the percentage change in absolute factor shares were as high as 204 per cent for land followed by 156 per cent for fertilizer. Non-availability of good seed material and a package of inputs along with technical know-how, inadequate and untimely provision of production credit and procedural delays in the sanction of crop loans, imperfect market structure and tendency for monopoly pricing were identified as major constraints in the development of bidi tobacco in Karnataka. Crop insurance, linking credit with marketing, scientific grading, coverage of bidi tobacco under tobacco board and vertical integration of buying the manufacture of bidi tobacco were suggested as policy measures for the development of bidi tobacco in the country.