ABSTRACTS OF Ph. D THESES

Shankara Murthy, H.G. 1986. Performance of the Karnataka State Co-operative Marketing Federation Ltd. and its Impact on Farm Market—An Economic Analysis. Andhra Pradesh Agricultural University, Hyderabad. *Major Advisor*: T.D.J. Nagabhushanam.

The present study is an attempt to empirically assess the performance and impact of the Karnataka State Co-operative Marketing Federation. Both primary and secondary data have been used in the study.

About 40 performance and 20 impact variables were identified for assessing the performance and impact of the Federation, respectively, through factor analysis. For analysing the operational efficiency of the various business activities undertaken by the Federation, data for 12 years (1973-74 to 1984-85) were subjected to both disaggregate and aggregate analysis.

An opinion survey was also conducted to collect primary data from three different categories of 158 randomly selected respondents from the Federation, sample Member Societies and sample Primary Service Cooperative Societies, representing the four major agro-climatic zones of the State and two principal categories of the Member Societies of the Federation.

The compound growth rate analysis was employed to evaluate the physical as well as financial growth and development of the Federation and a variety of ratio analyses were used to test the financial solvency, stability, profitability and efficiency of the Federation over years. The market share analysis was adopted to assess the impact and hold of the Federation at the state level in terms of various business activities it had undertaken. The factor analysis technique was employed to evaluate the performance and impact of the Federation, while the cluster analysis technique was used to assess the working of the Federation as well as member societies on the basis of the scores obtained for the selected variables in the opinion survey. The SWOP (T) management technique was adopted to identify the strong and weak areas of the Federation in its functioning and specify the opportunities to overcome the weaknesses.

The results indicated that the volume of business of the Federation had not only been substantially expanded but also diversified to a great extent over the study period. Financial ratio analysis (tests of solvency and strength) revealed a sound financial structure of the Federation but tests of profitability and efficiency did not indicate the soundness in operational efficiency.

The performance of the fertilizer business, the most important activity of the Federation, was on the whole statisfactory and offered vast scope for expanding the scale of its operation. The pesticides business was a loosing concern. The performance of the manufacturing and processing units of the Federation generally incurred huge losses on account of under-utilisation of their installed capacity. The Raichur Oil Complex, in particular, tended to become a sick unit. Commodity trading showed wide yearly fluctuations but had practically attained the break-even point over the period of study. Though market share of the Federation was negligible, the Federation's timely market intervention safeguarded the interests of the farming community. The average market share with respect to plant protection chemicals was 7.6 per cent of the State's total for the study period. The Federation and the member societies enjoyed a commanding position in the storage facilities in the State.

The total marketing activities of the Federation on the aggregate incurred an average annual loss of 13.88 lakhs during the 12 year period of study.

Some changes in the organisational structure of the Federation have been recommended to improve the efficiency of the Federation and member societies as well to make them much more socially responsible organizations than what they are today.

Chandra Reddy,T . 1987. Impact of Sericulture Industry on Income and Employment in Rural Areas of Chittoor District, Andhra Pradesh. University of Agricultural Sciences, Bangalore. *Major Advisor* : J.V. Venkataraman.

The study was undertaken to estimate the income and employment potential of sericulture industry and to compare it with other crop enterprises as well as to estimate the economics of silk yarn production. The data were collected for 1984-85 from a random sample of 144 sericulturists and 72 non sericulturists. The sample farmers were post-stratified into small (1.70 hect.) andlarge (6.67 hect) groups based on the land holdings. Principal components, Cobb Douglas production function and Frontier Production function analyses were employed.

The annual cost of establishing a hectare of mulberry garden was Rs. 225.20 for small and Rs. 222.39 for large farmers. The maintenance cost of mulberry garden per hectare was Rs. 7,659.35 for small and Rs. 7116.52 for large farmers. The mulberrry leaf production per hectare was 22,530 kgs and 22,750 kgs for small and large farmers, respectively. The cost of cocoon production per hectare was Rs. 14,842.84 for small and Rs. 14,935.60 for large farmers.

The small farmers incurred 51 per cent of total farm expenses on sericulture, while large farmers spent 30.50 per cent of total costs. The net return per rupee of investment from sericulture was Rs. 1.09 for small and Rs. 1.23 for large farmers,

while from competing crops, it was Rs. 0.29 from ragi, Rs. 0.82 from sugarcane and Rs. 0.85 from paddy for small and for large farmers it was Rs. 0.38, Rs. 1.11 and Rs. 0.81, respectively. Net returns from sericulture per hectare was highest for both small (Rs. 16,150.10) and large farmers (Rs. 18,288.14) than from any other crop, contributing nearly 62 per cent and 39 per cent of the total net returns, respectively.

The employment potential per hectare of mulberry leaf and cocoon production together accounted for 537.33 mandays for small and 627.95 mandays for large farmers in a year, reflecting the labour intensity of sericulture and it was highest when compared to other crop activities.

The production function analysis of mulberry leaf production for both size groups revealed that the five variables explained 91 per cent of variation in leaf production. In cocoon production variables included in the production function explained 89 per cent and 99 per cent of variation on small and large farms, respectively. The analysis of Frontier production revealed that the overall excess use of resources was to the extent of 44 per cent by small and 42 per cent by large sericulturists.

The cost of production of one kg of raw silk was Rs. 403.69 and gross income was Rs. 432.32. The net return was Rs. 28.84 per kg and the reelers utilised 1.33 mandays to produce one kg of raw silk.

Strong input-output linkage relationship exists between sericulture farms.

Gracy, C.P. 1987. Optimum Cropping Pattern for Farmers in Bangalore North Taluk, Karnataka—An Application of Parametric Linear Programming. University of Agricultural Services, Bangalore. *Major Advisor* : J.V. Venkataram.

The study was conducted in Bangalore North taluk. Data collected from 120 sample farmers selected from 8 randomly chosen villages provided the data base. Linear Programming and MOTAD models were used. The overall objective was to evolve risk efficient and risk free farm plans. The major findings are summarised as follows.

The large farmers with their existing cropping pattern realised Rs. 11399 49 (from 3.40 ha.) and small farmers realised Rs. 2991.77 (from 1.12 ha) as net farm return. Thus, by reorganisation of existing resources the net farm returns can be increased to the extent of 60.18% among large and 123.39% among small farmers.

In order to cultivate all the available land the large farmers need additional loan amount to the extent of Rs. 2502.63 over the existing borrowing level of Rs. 2500. For small farmers the present borrowing of Rs. 2000 is more than sufficient,

The cropping intensity was 128.82% and 135.71% among large and small farmers, respectively.

The reduction in interest rate over the present level of 11% did not show any significant impact on cropping pattern, labour use, borrowing and net farm returns among both large and small farmers. Thus it can be inferred that timely and adequate availability of funds is more important than reduction in interest rate.

A comparison of shadow prices of dry and irrigated land implies that providing additional land would be more beneficial to small farmers than large farmers and this may be noted by the policy makers concerned with the distribution of land under land reform policy programme. The optimum models of small and large farmers indicated an additional annual labour employment of 171.16 and 86.62 days, respectively.

The results of MOTAD model as compared to that of deterministic LP model confirmed the role of crop diversification in risk minimization. The MOTAD model had higher net farm returns with lower standard deviation compared to existing plan for large farmers. For small farmers the net farm returns were higher with higher standard deviation than the existing plan.

The cash use during the year was lower in MOTAD model than deterministic optimum models both for large and small farmers because the model suggested less capital intensive crops which also have lower deviation in net income.

The results provided alternative plans for both small and large farmers to choose depending upon their risk preference. In general, it could be inferred that the small farmers of Bangalore North taluk are more efficient in selection of crops to minimise the deviation in net income than the large farmers under existing, deterministic optimum and MOTAD optimum models.

Atteri, B.R. 1987. Impact of Himachal Pradesh Horticultural Produce Marketing and Processing Corporation (HPMC) on Marketing of Apple in Himachal Pradesh. Indian Agricultural Research Institute, New Delhi. *Major Advisor :* M.A. Muralidharan.

The present study was undertaken to study infrastructural changes developed by HPMC and its performance in terms of its set objectives, to study changes in marketing efficiency of apple, to examine and compare the behaviour of wholesale prices and price fluctuations of apple in selected markets at two time periods, namely, before and after the setting up of HPMC and to examine spatial and temporal pricing efficiency of apple marketing in selected markets in India.

Both primary data, from sixty farmers selected by stratified random sampling in three villages, namely, Bari, Kanyora and Kralish of district Shimla and secondary

data on weekly apple wholesale prices in Delhi, Calcutta and Madras markets for the periods 1965-1973 (period 1) and 1976-1984 (period 2) were used in the study. Spectral technique, cross spectral technique and tests on normality autocorrelation, runs and causality were used in the study.

It was concluded that HPMC has created massive marketing infrastructural facilities as envisaged in the project, but the capacity utilisation was very low. Further, the HPMC was mounting net losses which could be minimised by handling more fruits, utilising the generated infrastructural facilities of marketing and processing and improving the functioning of the Corporation. As a result of increase in marketing costs, the farmers' share in wholesale price has marginally decreased after HPMC as compared to before HPMC period. Trend, 24 weeks cycle and irregularity in wholesale apple prices were observed in all the markets in both the periods. The variation in wholesale price in Delhi market has decreased during HPMC period. As for intertemporal and spatial pricing efficiency in all the three markets concerned, it was found that all the three markets were temporally inefficient but spatially efficient in pricing. Causality test indicated that Delhi and Calcutta markets had bidirectional relation in period 2 as compared to period 1. It was suggested that HPMC should reduce the sharp fluctuations in wholesale prices in all the markets by storage operation. All cull fruits should be procured for processing and should not be allowed to compete with fresh apple fruit.

Basavaraja, H. 1988. Yield Gaps and Constraints in Cotton Production in Karnataka : An Econometric Analysis. University of Agricultural Sciences, Dharwad. *Major Advisor* : K.C. Hiremath.

The magnitudes of yield gaps and the factors responsible for these gaps have been examined. The study is based on the data collected from 240 sample farmers of the two predominantly cotton growing districts, namely, Dharwad and Raichur of Karnataka and the relevant research and demonstration data for the year 1987-88. The study estimated the magnitudes of yield gaps and analysed the impact of biological and socio-economic factors on the realised level of potential farm yield. The contribution of inputs to yield gaps was estimated by means of the Path Coefficient Analysis and Decomposition Technique.

The yield gap in cotton was 42.73 per cent. The size of Yield Gap-I was generally very small (4.70%), while that of Yield Gap-II was quite large (39.91%). On an average, the farmers realised about 60 per cent of the potential farm yield in cotton and it was significantly conditioned by real variables such as plant nutrients and labour and a set of dummy variables like soil type, irrigation, time of sowing,

method of fertilizer application, credit access and participation in the extension education programmes.

The Path Coefficient Analysis revealed that the plant nutrients exerted the maximum direct effect on yield gap, followed by the plant protection chemicals, labour and seeds in most of the cases. The Decomposition Analysis showed that a little more than 50 per cent of the potential farm yield in cotton remained untapped by the farmers. The analysis suggested that a large portion of the untapped farm potential yield could be exploited by using more inputs on Dharwad farms and by adopting appropriate techniques of production, without incurring any additional cost, on Raichur farms.

Subbarayan, M. 1988. Conjunctive Use of Ground Water and Surface Water for The Optimal Irrigation Management and Cropping Pattern in Eastern Yamuna Canal Command, Western U.P. Indian Agricultural Research Institute, New Delhi. *Major Advisor* : Ikbal Singh.

The present study was undertaken during 1986-87 in the Eastern Yamuna Canal (EYC) command area of Western Uttar Pradesh to examine the existing water utilization, to develop decision rules for optimal irrigation management and cropping pattern and to suggest policy for water use in the command area.

The data collected for the present study related to the availability of surface and ground water, land, human labour and working capital, nitrogen fertilizer consumption, cropping pattern, physical input-output coefficients for different crops and prices of farm products and inputs. The existing plan for the command area was examined. The optimization of water resource through conjunctive use of surface and ground water was done with the help of simple linear programming technique. The model contained 111 decision variables and 87 constraints. The results of optimization were compared with the existing plan to derive some useful conclusions and to suggest policy for water use in the command area.

In the existing plan, sugarcane crop received the maximum depth of irrigation water as well as the largest quantity of total water available in the command area. The water utilization in the *kharif* months was high compared to the *rabi* months. The total human labour employment in the existing plan was 45.92 million labour days. The average nitrogen utilization per hectare in the command area was 98.76 kg. and the total consumption was 34903.88 metric tonnes. The existing total working capital use in the command area was 845.81 million rupees. In the existing cropping pattern, wheat occupied the highest area followed by sugarcane, *kharif* fodder crops, paddy and maize. The gross cropped area of the EYC command area was 353436 ha. and the cropping intensity was 159.72 per cent. Sugarcane crop

contributed the highest share to the total net returns, followed by wheat and paddy. The existing total net returns in the command area were 2101.36 million rupees.

On optimization, 88.08 per cent (159493 ha. m.) of the existing supply of total water (surface and ground water) was utilized. Irrigation acted as the most limiting factor in most of the *rabi* months (November, December and January). In the optimal sugarcane consumed the highest quantity of water. The water utilization in the *kharif* months was considerably higher than that in the *rabi* months. The human labour employment increased by 9.16 per cent to 50.105 million labour days in the optimal plan also plan. The total nitrogen consumption increased to 38659.77 m. tonnes in the optimal plan. The total working capital use increased to 946.67 million rupees in the optimal plan. On optimization, there was significant change in the cropping pattern. The gross cropped area increased to 365572 hectares and the total net returns also increased to 2617.47 million rupees (an increase of 24.56 per cent over the existing plan) in the optimal plan.

The policy prescriptions of the present study are to consider the construction of a storage reservoir, increasing the exploitation of ground water, gearing up the credit supplying agencies and extension agencies to implement the optimal plan and to consider the practicability of new irrigation methods which can save water losses and increase the water use efficiency.