

## **Growth of Horticulture Sector in Andhra Pradesh: An Aggregate and District Level Analysis**

**P.G. Chengappa<sup>1</sup>, K. Kareemulla<sup>2</sup>, C.A. Rama Rao<sup>2</sup> and Sreenath Dixit<sup>2</sup>**

<sup>1</sup>University of Agricultural Sciences, Bangalore-560 024, Karnataka

<sup>2</sup>Central Research Institute for Dryland Agriculture, Santoshnagar, Hyderabad-500 059, Andhra Pradesh

Andhra Pradesh is the second largest producer of horticulture crops. The state is giving special thrust to the sector under various schemes. In the present study, an analysis of the growth in area, productivity and production has been done for the state as well as at the district level for the period 1998-99 to 2005-06. Compound annual growth rates have been estimated for different sub-sectors like fruits, vegetables, spices, flowers and nuts and palms. The study has revealed that nuts and palms which had the largest area-share in the horticulture sector in the TE 2001, have paved way to the fruits by 2005-06. There has been a significant growth in the area of orange and mango in the state without gains in productivity, mainly due to growth in their consumption within the state. Relatively backward districts like Anantapur, Mahabubnagar and Adilabad have shown an impressive growth in fruit crops. Among vegetables, though there has been a marginal decline in the area of tomato, the yield gains have pushed the production, more so in the districts like Ranga Reddy and Mahabubnagar. The growth rates of area and production of spices in almost all the districts have been found negative. In the case of flowers, a very high growth rate in area has been observed in the districts like Guntur, Chittoor and Anantapur, and a significant productivity growth is visible in Chittoor, East Godavari, Visakhapatnam and Kadapa districts. There has been a moderate growth in the traditional districts of Godavari in respect of coconut, while in all other districts, there has been a decline. Oil palm has gained significantly being a new and promising crop. While proximity to the regulated markets and cities coupled with promotional schemes seems to have encouraged growth, much more needs to be done to build upon these achievements with more infrastructure development and encouragement to resource-poor farmers in the sector.

## **Horticulture in India: Opportunities in Mountainous States**

**Virender Kumar and Harbans Lal**

Department of Agricultural Economics, CSK Himachal Pradesh  
Agricultural University, Palampur-176 062, Himachal Pradesh

Lately, horticulture has emerged as the key instrument of the Indian agricultural development strategy against the scourge of poverty, unemployment and malnourishment. As such, it has attracted massive hikes in the plan outlays. Though, horticultural-based agricultural diversification in India has been most prominent in the southern and western regions, many states in the north-east and north-west regions hold huge promise to make this diversification more broad based. Realising this potential, tremendous policy support has been given to these states in the form of various schemes in the past couple of years. The present article has analysed the performance of this sector at the national level, especially with respect to exports and has examined the changes in contribution of horticulture in the mountainous states of north-west and north-east regions, using secondary data. The results have revealed that the growth in output of fruits and vegetables slowed down during the second half of 1990s. The exports of total fruits and vegetables have depicted a robust growth during the past one decade or so. Notwithstanding the extreme shortage of cold chain facilities, the share of processed fruits and vegetables in the total exports has indicated an increasing trend. The cause for concern is that the area under fruit and vegetable crops in these mountainous states has witnessed a decline during the study period; the decline being more severe for vegetable crops. The productivity of fruits and vegetables has revealed a hike in these states, the hike being more pronounced in fruit crops. Though, the value of output from total fruits and vegetables in the mountainous states has exhibited a robust growth rate, their share in the total value of output from fruits and vegetables in the country has remained unchanged. The study has concluded that extra policy support to these states for the development of horticulture is yet to become more discernible in terms of growth of horticulture sector.

## **Horticultural Development in Uttar Pradesh: A Key to Buoyant Agri-business Proposition**

**R.K. Singh<sup>1</sup> and N.P. Singh<sup>2</sup>**

<sup>1</sup>Department of Agricultural Economics & Statistics, C. S. Azad University of Agriculture & Technology, Kanpur - 208 002

<sup>2</sup>Division of Agricultural Economics, Indian Agricultural Research Institute, New Delhi - 110012

The production potential of horticultural crops in Uttar Pradesh has been highlighted along with drawing a roadmap for its development in the state. Although there are hundred of fruits and nut species of tropical origin that may be considered for commercial development, the number of actual successful crops is small. For achieving success in the context of agri-business, the most important step is selection of fruits of commercial value. This may involve several steps starting from generating a list of potential food species; identifying commercial (economic) species; determining commercial success of foods in the given region; defining development opportunities and potential problems / constraints and earmarking key extension points required to ensure commercial success. The economic value may be determined by factors like consumer potential, quality; buyer's confidence; market development; competition with other fruits; place in the dietary chain; ease of consumption; ability to promote and sell in particular markets; processed product market, product marketing characteristics, etc in the study area. The paper has suggested utilizing of favourable agro-ecological endowments, growing size and labour resource and established advantage for tropical fruits development in the state of Uttar Pradesh. It has also suggested development of a higher level of infrastructure and dissemination of technological advances for establishing new outlets in the state in present regime of market globalization.

## **Growth in Area, Production and Productivity of Vegetable Crops in Different Agro-Climatic Zones of Rajasthan**

**Prem Chand and Rajesh Sharma**

Department of Agricultural Economics, College of Agriculture, Rajasthan Agricultural University, Bikaner, Rajasthan

Considering the importance of vegetable sector in the Indian economy, the growth performance of vegetable crops has been studied in the state of Rajasthan. Looking to the varied climate in the state, zonal level studies have been undertaken with the specific objective of studying growth in area, production and productivity of vegetable crops. Compound growth rates have been used to estimate the growth rates for the period 1980-81 to 2002-03. The estimated growth rates have revealed a wider variability in productivity of vegetable crops than growth in area under vegetable crops. Peas, tinda, onion, bottle gourd, bitter gourd, and guar phali are some of the important crops which have shown good performance in the state. The performance of Zone IIIB has been found best in vegetable products. Considering wider variability in area than production and productivity of vegetable crops, the study has suggested that efforts should be made to stabilize area so as to improve value productivity in the state.

## **Potato and Rural Prosperity in Garhwal Region of Uttarakhand : Need for Institutional Intervention**

**Anil Kumar Dixit**

VCSG College of Horticulture, Bharsar, G.B. Pant University of  
Agriculture and Technology, Pantnagar, Uttarakhand

The agriculture in Uttarakhand is gradually diversifying towards high-value food commodities and potato has emerged as a viable commercial enterprise in the Pauri district of Garhwal region in the state. Two belts, viz. Kaproli (comprising villages of Kaproli, Jalu and Mushati) and Salon Khal (comprising villages of Salon Khal, Tripalisain, Sothi and Behro Khal) have been identified for potato production. The paper has analysed the economics of potato cultivation, examined the production and marketing constraints and suggested strategies for the effective production practices and marketing management. The base line survey (2006-07) has shown that the target area is backward from several considerations, viz. traditional and dryland agriculture, low productivity, and negligible marketable surplus in the case of cereals and pulses. Under such a situation, potato production which fits well into the multi-cropping systems is the only ray of hope for their livelihood security. The results have revealed that the net returns per hectare are higher in potato than other crops grown in the area. The prevailing marketing constraints such as lack of vegetable mandi within 200-km radius, poor post-harvest infrastructure, and lack of transportation and communication facilities do not allow the farmers to take advantage of the emerging opportunities. In the absence of sound financial position and poor credit accessibility, the potato growers become victim of local contractors, who come from Haldawani, Ramnagar, Rudharpur and Kotdwar, covering a distance of 200-250 km. The average per kg price received by the farmers at farm gate has been found to be Rs 7 to Rs 8 during the months of July and August when the average per kg wholesale price ranges from Rs 13 to Rs 15. The scenario calls for concerted efforts for establishing public-private partnership for creating basic infrastructure facilities. The study has suggested that non-governmental organisations (NGOs) should act as facilitators and extension workers for accessing both technology and credit facilities so as to capture national and international markets.

## **Coldwater Aquaculture — A Potential Agribusiness**

**P. Selvaraj and S.L. Kumbhare**

National Bank for Agriculture and Rural Development (NABARD) Head  
Office, Bandra-Kurla Complex, Bandra (East), Mumbai- 400 051

India is the second largest producer of inland fish in the world, after China and has huge untapped potential resources, including cold water streams. This sector can provide opportunities for future agri-business in the hilly states and will help in harnessing the untapped potential under aquaculture, packaging, transportation, and supply network. The paper is focused on experiences of cold water aquaculture (trout farming) in four blocks of the Mandi district in Himachal Pradesh. Factors like availability of cold water streams, subsidy, expectation of high returns, etc. have motivated the first generation entrepreneurs to undertake the high-value cold water aquaculture. Three of the four units studied, have incurred losses on account of inadequate feeding, poaching, poisoning and diversion of water flow by local miscreants. The study has revealed that trout being cannibalistic in nature, inadequate feeding had led to poor yield and inadequacy of technical know-how, lack of hands-on experience, lack of insurance products as well as credit compounded the problems. The adverse effect of failure has been reported to be managed through income from other sources, including crop cultivation and subsidy from the government. Some of the strategies suggested to overcome the problems are promotion of cluster development of trout farms; development of backward and forward linkages; establishment of hatcheries, feed mills; mobile aqua clinics, one-stop aqua shops, public-private partnership, and the coordinated efforts of all the stakeholders in the development process.

## **Evolving Milk Pricing Model for Agribusiness Centres: An Econometric Approach**

**V. Saravanakumar<sup>1</sup> and D.K. Jain<sup>2</sup>**

<sup>1</sup>Directorate of Agribusiness Development, Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu

Dairy Economics, Statistics and Management Division, National Dairy Research Institute, Karnal, Haryana

Since dairying is practised as a component of mixed farming systems, it becomes imperative to take into account interrelationships among enterprises and general economic factors while fixing the milk price, instead of simply following the existing/ traditional pricing system. In this connection, this study has dealt basically with three issues: (i) identifying defects in the existing/ traditional pricing system being followed by the dairy business centres, (ii) developing a long-term pricing model, based on cost of production and net income, and (iii) projecting different price scenarios of milk in future by simulating general economic conditions. For the study, undertaken in the Tamil Nadu state, a sample of 20 households rearing buffaloes has been selected randomly from the eight selected villages, thus making the total sample of 160 farms. The data have been collected on socio-economic characteristics and input-output parameters of dairy enterprise for the year 2002-03 for both flush and lean seasons. Normalized restricted quadratic profit function and price determination models have been used to analyse the data. The study has revealed that for sustainable returns, the milk price needs an upward adjustment of 9.97 per cent, and to provide a constant net monetary income, the milk price needs an upward adjustment of 10.30 per cent for the buffalo milk. Considering 2002-03 as the base year, the per litre price for milk has been projected to be Rs 23.64 at constant monetary income and Rs 23.15 at constant return to production cost in the year 2009-10. The results of the paper are illustrative of the utility approach in generating consistent price sets for milk in response to alternative policy interventions.

## **Trends of Pulses Production in Planned Economy of India**

**Jitendra Singh, Raj Kishor and S.P. Singh**

Department of Agricultural Economics, G.B. Pant University of Agriculture & Technology, Pantnagar-263 145, Uttarakhand

The present study has been conducted with the objectives of (i) examining the trends of area, production and yield of pulses in planned economy of India, (ii) identifying the factors responsible for stagnation of pulses production in India, (iii) assessing the impact of existing level of pulses production on demand and supply of consumers along with economy of the country, and (iv) suggesting suitable policy for future sources of growth in pulses production in the century.

The productivity of pulse crops in India has been found very low despite favourable agro-climatic and environmental conditions of the country. Various biotic and abiotic factors are responsible for lower area, production and productivity of pulses in India. Also, a large number of production technologies of pulses generated by R&D institutions have been either not disseminated or their adoption has been low, resulting in lower productivity of pulse crops in the country. It has been found that production of pulses has been constant, 11-15 million tonnes for the past four decades. The availability of pulses has reduced very fast, from 69.0 g/capita/day in 1960-61 to 29.1 g/capita/day presently, whereas FAO and WHO recommend an intake of 80 g pulses per day. It has studied reasons for India's export of pulses despite their domestic shortage. Finally, the study has suggested several strategies for meeting the challenges of pulses production in the country. Also, a wider institutional support is essential for the coverage of pulses crops under comprehensive crop insurance scheme for minimizing risk and uncertainly due to various natural as well manmade calamities.

## **Role of Castor Seed Production in Farmers' Economy in District Kanpur, Uttar Pradesh**

**J. Rai, A.K. Yadav and Rahul Kumar Rai**

Department of Agronomy, C.S. Azad University of Agriculture and  
Technology, Kanpur – 208 002, Uttar Pradesh

To find the role of castor seed in farmers' economy, the present study has measured the benefits to castor growers during the agricultural year 2005-06, using the multistage random sampling technique for selecting the block, village and castor growers in the district Kanpur. A total of 30 castor growers (12 small and 18 marginal) were selected randomly from 5 castor growing villages selected randomly in the block Sarsaul. The compound growth rate analysis of castor crop has been carried for one decade (1994-2004) on five-year interval basis. During 1994-1998, the compound growth rate of area has shown a negative trend, (-) 1.7 per cent per annum, while production and productivity increased @ 0.14 per cent and 1.76 per cent per annum, respectively. During 1999-2004, the area and production have both depicted a decrease with (-) 7.21 per cent and (-) 6.12 per cent per annum, while productivity has shown a positive trend of 1.20 per cent per annum. The average yield of castor crop has been recorded quite high (25.22 q/ha) due to better irrigation and input substitution at samples farms in the study area. The net income of Rs 22,766/ha has been noticed from the sole castor crop, depicting a return of 2.5-times on investment. The intercropping of chilli with castor has been found quite attractive economically, and has yielded almost three times higher returns than those provided by sole castor crop. It has been due to lower input costs and higher yield obtained in castor+chilli intercropping system. The study has revealed that instability in prices and inefficient marketing are the major drawbacks in the extension of area and production of castor crop. A better policy support for price and efficient marketing system would encourage the farmers to grow more castor under the umbrella of assured price policy and structure.

## **Trends in Oilseed Production in Jharkhand: An Empirical Analysis**

**R.P. Singh, Rupam Renu and K.P. Saha**

Department of Agricultural Economics, Birsa Agricultural University,  
Kanke, Ranchi-834 006, Jharkhand

The production scenario of oilseed crops in Jharkhand has been presented based on the secondary data collected from various sources. The area coverage has been found highest under rapeseed and mustard, followed by linseed, sesamum and groundnut. The average production per year has been recorded maximum for rapeseed & mustard, followed by groundnut, linseed, sesamum and sunflower. A positive trend has been observed in case of rapeseed & mustard and groundnut, while a decreasing trend has been obtained in sesamum, linseed and sunflower. The average yield per hectare has been recorded highest in groundnut, followed by rapeseed & mustard, linseed and sesamum. On this basis, a positive trend has been seen in rapeseed & mustard, sesamum and sunflower, while there has been a reverse trend in linseed and groundnut. The average annual growth rates per annum in groundnut, sesamum, rapeseed & mustard, linseed and sunflower have been found as 9.42 per cent, 1.49 per cent, 8.36 per cent, 4.41 per cent and 1.98 per cent as compound ratio, respectively. The variability analysis of area has revealed sunflower to be the most instable crop among oilseeds, followed by groundnut, sesamum, rapeseed & mustard, respectively. The productivity variability analysis has also shown sunflower to have maximum instability, followed by sesamum, linseed and rapeseed & mustard.

## **Growth Trends in Major Oilseeds — A State-wise Analysis**

**J. Sadeesh, A. Pouchepparadjou and R. Sendhil**

Department of Agricultural Economics, Pandit Jawaharlal Nehru  
College of Agriculture and Research Institute, Karaikal-609 603,  
Territory of Puducherry

The oilseeds scenario in the country has undergone a dramatic change in recent years due to various incentives and institutional support provided by the government for the development of this sector. The present study has investigated trends in area, production and yield of oilseeds in the major oilseeds-producing states of India. The analysis has shown that there exists a high degree of fluctuations in the annual area, production and yield of oilseeds. The study has shown a significant positive growth in area, production and yield of oilseeds during the overall study period. However, the productivity growth in the total oilseeds has shown a decline during past-TMO period as compared to the pre-TMO period. Therefore, efforts should be made to sustain and augment the productivity of oilseeds in different states to meet the present and future demands.

## **Projecting Demand for High-Yielding Variety Seeds of Cereal Crops in India**

**B.R. Atteri, Shiv Kumar, J.P.S. Dabas and Puran Chand**

Division of Agricultural Economics, Indian Agricultural Research Institute,  
New Delhi-110 012

The study has revealed that total HYVs area would increase from 90.87 M ha in 2004-05 to 126.17 M ha by 2019-20, which would be about 60 per cent of the cropped area by 2020. In fact, 7 per cent area under un-irrigated HYVs in 2004-05 will increase to 26 per cent by 2019-20. Based on the existing parameters, total area under rice will increase from 45 M ha in 2000-01 to 55 M ha during 2019-20 and almost 97 per cent rice area will be under HYVs by 2020. A large irrigated area will be under basmati varieties because of their high market demand. The area under wheat will increase from 25 M ha in 2000-01 to 31 M ha by 2019-20. The projected demand of rice seeds of HYVs for transplanted paddy as well as sown by broadcasting/dibbing method will be 3.13 Mt, 3.24 Mt and 3.37 Mt during 2009-10, 2014-15 and 2019-20, respectively, which is the highest among cereal crops. The demand for wheat seeds of HYVs will be 2.51 Mt, 2.68 Mt and 2.86 Mt during 2009-10, 2014-15 and 2019-20, respectively. The demand of seeds of jowar and bajra HYVs will be 0.08 Mt and 0.02 Mt, respectively, in 2019-20. The demand of maize HYV seeds will increase reasonably high; it will be 0.10 Mt, 0.11 Mt and 0.12 Mt by 2009-10, 2014-15 and 2019-20, respectively. The study has concluded that there is still a need for increasing area under HYVs in view of the decreasing net sown area. There is a need of higher resource allocation to research for developing suitable varieties for local agro-climatic conditions and extension services for higher adoption of seeds of HYVs. The demand for rice seeds of HYVs will increase steadily due to slow increase in the gross irrigated area. Keeping the global opportunity in view, especially for basmati rice, the study has suggested to do more efforts to increase area under it. Also, attention should be paid towards increasing area under maize HYVs to meet their demand for feed and fodder purposes in the national and international markets.

## **Farming Systems Diversification: A Study on Marginal Holders in Western Uttar Pradesh**

**S.P. Singh, B. Gangwar and M.P. Singh**

Project Directorate for Cropping Systems Research, Modipuram,  
Meerut - 250 110, Uttar Pradesh

The adoption of agricultural diversification by marginal farmholders in western Uttar Pradesh has been studied by selecting districts of Bagpat as a high productivity and Ghaziabad as a low productivity district. The study pertains to 57 marginal farmers (30 livestock-based and 27 sugarcane-based) of the area out of 197 farmers interviewed randomly during the agricultural year 2004-2005. The analysis has revealed that livestock farm households get employment for 243 human-days per year compared to 205 human-days per year by sugarcane households. Education index has shown that members of sugarcane households were more educated than those of livestock households. The income from livestock has been found as a major (52%) source of income. Both the categories of farmers earn less than Rs 45000/- per year from the farm business as a whole, which is not sufficient for household security. The vegetable crops have been found higher paying than other farm enterprises. However, the net returns have been found far below the potential returns. There is a large scope in enhancing income through diversification towards vegetables. Since cost on insecticides and pesticides has been found to constitute only about 1 per cent of the total cost, the farm produce of marginal farmers is almost a 'organic product'. By and large, crop diversification, farm size, education and employment have been reported strong variables affecting farm diversification. Fragmentations and subdivisions of landholdings, scarcities of labour, low yield of local seeds, less reliable market, scarcity of owned-fund and exogenous factors like, dependence on natural resources, global warming, non-availability of good quality seeds (variety and breeds) and shades for animals, poultry, etc. have been found the major constraints in following the integrated farming system.

## **Diversification towards Commercial Farming— A Success Story**

**V.P. Luhach, R.K. Khatkar and Kuldeep Deswal**

Department of Agricultural Economics, CCS Haryana Agricultural  
University, Hisar-125 004, Haryana

This case study on diversification towards commercial farming has been conducted in Bamla village of Bhiwani district in Haryana state. It is about the spectacular progress made by the farmer named Shri Vikram Singh by converting his farm from traditional unit to commercial venture on the advice of the scientists of CCS, HAU and KVK, Bhiwani. His gross returns have been found to be Rs 4,06,872 by incurring the total cost of Rs 2,03,896. The benefit-cost ratio of 1:2.0 indicates that he has improved his earnings from merely twenty-one paise on investment of one rupee to Rs 2, after introducing commercial crops of vegetables and fruits. He has registered an increase of about 315 per cent in gross returns and 1093 per cent in net returns, by increasing total cost by 152 per cent and operating cost by 219 per cent. The costs as well as returns per unit of cropped area and operational holding have increased many folds after commercialization of farming over traditional farming. The cost of production has also come down due to improvement in productivity of almost all the crops. This has been largely attributed to diversification towards commercial crops like fruits and vegetables in combination with adoption of improved technology suggested by the university scientists. Thus, the diversified farming towards commercial and export-oriented crops can make the agriculture an economically viable enterprise. There is a need to demonstrate such success stories to a large number of farmers. Incentives need to be provided to such farmers to encourage diversification towards commercial and export-oriented crops to make our agri-products competitive in the international market under the WTO regime.

## **Evaluation of Production and Agri-business Opportunities of Maize (*Zea mays*) in *Diara* Areas of Lower Gangetic Plains: Status, Potentials and Strategies**

**M.K. Wadhvani and S.B. Singh**

Bihar Agricultural College, Rajendra Agricultural University, Sabour,  
Bhagalpur - 813 210

The land situated in close vicinity to the rivers constitutes the *diara* ecosystem and has great potential of crop productivity in general. The present study, based on the primary data collected from a sample of 144 *diara* farmers from 24 villages of the Bhagalpur district through multistage random sampling technique, has evaluated the present status and potential of crop productivity and has suggested strategies for enhancing productivity and agri-business opportunities of maize in the *diara* areas. Since during *kharif* season *diara* are inundated, farmers cannot adopt intensive technology due to high degree of risk and uncertainties. It has been found that farmers cultivate most of their crops during *rabi* season to fulfil their farm and family needs, based on the principles of sustenance, which is depicted by diversified cropping pattern. Maize is extensively grown in these areas throughout the year, with the winter maize having a special significance in the *diara* economy. The *rabi* maize has recorded highest profit of Rs 16998/ha followed by *kharif* maize (Rs 5376/ha). The marketed surplus of hybrid maize grown during *kharif*, *rabi* and *zaid* seasons has been found as 91.88 per cent, 94.48 per cent and 96.94 percent of the total production, respectively. In addition to providing increased income, maize generates additional employment, improves food security, enhances farmers' attitude towards marketing and has helped in reducing migration of labour from Bihar. Therefore, there is an urgent need to have public interventions in maize marketing to sustain its production.

## **Vegetable Seed Business in Belgaum District: An Analysis of Market Structure and Farmers' Preferences**

**S.B. Mahajanashetti, H. Basavaraja, N. N. Karnool, S. M. Mundinamani and Raju Hosamani**

Department of Agribusiness Management, College of Agriculture,  
University of Agricultural Sciences, Dharwad-580 005, Karnataka

Karnataka is one of the major vegetable producing states in India with an area of 3.67 lakh hectares under vegetable production. Belgaum district of the state occupies first position in vegetable production in northern Karnataka and second position in the entire state. Several seed companies in the corporate sector cater to the regular demand of vegetable seeds in the district. The present study, related to the seed market in the district, has (i) analyzed dealers' concentration in seed market, (ii) assessed farmers' preferences in vegetable seed purchases, and (iii) identified the problems faced by farmers and dealers in vegetable seed marketing. The Lorenz curve analysis has indicated lack of market power concentration with dealers and the operation of competitive forces in the seed market. It has also been revealed by the results that (a) the most important factor considered by the farmers in seed purchases was yield level, followed by germination percentage, neighbours' opinion and brand among others, (b) seed price was of least importance for the farmers, (c) field demonstrations were the most effective promotional measure, followed by field demonstrations, visits to research plots, field days, exhibitions, etc., and (d) most severe problems faced by the farmers in seed marketing were non-availability of seeds in time, low yield, non-viable seeds and fake seeds in that order. The study has called upon the seed companies to make extra efforts to ensure availability of quality seeds in time to the farmers and take up the promotional activities like field demonstrations, farmers' visits to research plots and organization of field days on priority basis.

## **Economic Analysis of Mango Fruit Plant Nurseries in Karnataka**

**P.D. Vijayendra Hegde and B.L. Patil**

National Bureau of Soil Survey and Land Use Planning, Regional Centre,  
Hebbal, Bangalore-560 024, Karnataka

Comparative economics of mango fruit plant nurseries has been studied in the existing mango scion blocks as well as nursery outlets in Bangalore (urban) and Dharwad districts of Karnataka. The cost of production of 100 mango plants has been found as Rs 1884 under the Bangalore region (stone-grafted plants) and Rs 2994 under the Dharwad region (approach-grafted plants). The expenditure incurred by traders in trading of mango plants has amounted to Rs 4075 per 100 plants. All the three groups under study have been found economically better with a net return of Rs 1805 in the Dharwad nurserymen group, followed by Rs 1780 in the Bangalore nurserymen group and Rs 1668 under traders group. The nurserymen groups of Bangalore and Dharwad have respectively recorded Rs 1.93 and Rs 1.59 as return per rupee of expenditure compared to that of traders group (Rs 1.39).

## **Agri-business of Citrus Fruits in Madhya Pradesh**

**R.S. Singh and V.V. Singh**

Agriculture Mechanization Division, Central Institute of Agricultural  
Engineering, Bhopal-462 038, Madhya Pradesh

Citrus being an important horticultural crop grown on about 34 per cent of the total area under fruits in the state of Madhya Pradesh, the present study has examined the (i) existing cultivation practices and constraints; (ii) costs, returns and economic feasibility of investment; (iii) socio-economic factors that affect the production and marketing; and (iv) scope of mechanization and has also suggested a suitable strategy for the development of citrus agribusiness in the state. The study has been conducted in the Chhindwara, Hoshangabad and Dhar districts involving 64 citrus growers (orange, sweet orange / mosambi and lime) and collecting data through survey method during the year 2005-06. Citrus, being perennial crops, are highly labour-intensive and therefore their cultivation generates employment in the area. The study has revealed that it to be a capital-intensive crop requiring about Rs 23,000/ha for establishment of orange and Rs 30,000/ha for establishment of sweet orange/mosambi crops. Profits in citrus cultivation have been found significantly higher with high benefit-cost ratio and lower payback period. Thus, citrus cultivation has been found profitable and economically viable and provides sustainable income to the growers. Since most of the operations are being performed manually, the study has suggested the need for mechanization of important cultivation operations for reducing labour cost, enhancing productivity and providing higher returns to the growers. Scarcity of labour during peak periods, lack of credit facility, scarcity of water, inadequate power supply, malpractices in weighing and ignorance of quality of produce have been identified as the major constraints to agribusiness of citrus in the state.

## **Constraints in Production and Marketing of Grapes in Sangli District of Maharashtra**

**B.H. Kamble, M.S. Jadhav and D.B. Yadav**

Department of Agricultural Economics, MPKV,  
Rahuri-413 722, Maharashtra

Constraints in production and marketing of grapes have been identified by selecting 15 villages (8 from Tasgaon and 7 from Miraj tehsil of Sangli district in Maharashtra). Out of the total grape growers, 6 grape growers (2 for each variety of Sonoka, Thomson Seedless and Tas-A-Ganesh) were selected randomly from each village, making the total sample of 90 grape growers. The data collected for the year 2004-2005 have been analyzed by tabular method of analysis. The study has identified non-availability of skilled labour at proper time, lack of technical knowledge, non-availability of bank loans, non-availability of pure variety grafts at nearest places, and high cost of various inputs, viz. insecticides, pesticides, micronutrients as the major constraints in production of grapes in the Sangli district. The marketing problems have been revealed as high commission charges by intermediaries (48 per cent), high cost of transportation (44 per cent), high cost of packing material (10 per cent), low net returns, lack of pre-cooling and cold storage facilities, and longer chain of intermediaries in the marketing. The study has suggested that the number of market intermediaries should be reduced through establishment of co-operative marketing. Also, the state government should enact a policy on grape marketing similar to that adopted by Government of Andhra Pradesh, viz. provision of stalls to the growers in the urban markets.

## **Business Potential of Goat Rearing as a Agribusiness Enterprise for Rural Maharashtra**

**M.N. Waghmare, S.N. Tilekar and P.N. Shendage**

Department of Agricultural Economics, MPKV, Rahuri – 413 722,  
Maharashtra

The economics of goat rearing in Maharashtra has been studied based on the primary data collected from a sample of 90 goat owners from Osmanabad district of Maharashtra by survey method for the year 2003-2004. For analysis, the respondents have been divided into three size groups, viz. small (< 20 goats), medium (21-40 goats) and large (> 40 goats). The total fixed capital investment per flock has been found as Rs 44177, in which herd stock constituted the main component in goat rearing. The per flock net returns over working cost have been found as Rs 33,523 and net returns over total costs as Rs 23,714. The net returns over total cost have shown an increasing trend with increase in the flock size. The output-input ratio at working cost has been found as 2.47 and at total cost, as 1.72. The study has argued that there exists a scope to increase annual gross returns from goat rearing by expanding the size of flocks. The farmers prefer to dispose off their goats to the merchants in nearby markets rather than selling to slaughter men in the village. The per kid average price realized has been recorded as Rs 1075.00. On an average, the marketing cost has worked out to be Rs 28.42 per goat. The net returns per goat per annum have shown an increasing trend with an increase in flock size, indicating constant returns to scale.

The study has outlined the need to develop market infrastructure for marketing of goat and goat products. It can be stated that this enterprise can generate additional employment and income for the weaker sections of the society and farming households in the state and will help improve their economy.

## **Marketing of Mushroom in Ahmednagar District of Maharashtra**

**M.S. Jadhav and S.S. Kaware**

Department of Agricultural Economics, MPKV,  
Rahuri-413 722, Maharashtra

The present investigation, carried out in the mushroom growing pockets spread in the Ahmednagar district has assessed the marketing of mushroom by collecting data through survey method for the years 2005-06. The data include expenses incurred on various aspects of marketing, price fetched by the growers, marketing functionaries, etc. The study has recorded use of following channels in marketing of mushroom: Growers – Wholesaler – Export (Channel-I), Grower – Retailer – Consumer (Channel-II), and Grower – Consumer (Chanel-III).

The per kg marketing costs in channels I, II and III have been found as Rs 3.62, Rs 3.45 and Rs 2.92, respectively. The highest quantity of mushroom is sold through channel-III. Producers share in consumer rupee has been found as 51.52 paise in channel-I, 58.01 paise in channel-II and 80.92 paise in channel-III. The study has identified the following problems in marketing of mushroom: (i) lack of networks of transportation, (ii) lack of cold storage facility, (iii) non-availability of funds at right time, and (iv) high cost of commission of traders.

## **Economic Performance of Agro-based Industry of Mushroom Production in Maharashtra**

**M.S. Jadhav, P.N. Shendage and D.B. Yadhav**

Department of Agricultural Economics, MPKV,  
Rahuri - 413 722, Maharashtra

The economic performance of agro-based industry of mushroom production has been studied in Maharashtra by working out cost and returns, and marketing cost. The study based on the data for the year 2005-06, has selected two private sector mushroom units, viz. Cryptogam Ltd., Pune and Ambika Mushroom Unit, Ahmednagar and has used simple statistical tools for analysis of data. The per kg total cost of mushroom cultivation has been found as Rs 24.47, constituting 54.5 per cent as variable cost and 45.5 per cent as fixed cost. The per kg marketing cost of mushroom has been worked out to be Rs 3.64. Packing and transportation have been noted as the major components of marketing cost. The cost of production of mushroom has been worked out as Rs 28.11/kg. The gross returns have been found as Rs 61.67/kg and net returns as Rs 35.11/kg, with benefit cost ratio of 2.19. Irratic electricity supply, lack of availability of finances, lack of cold storage facilities, and non-availability of quality spawn have been identified as the major problems in production of mushroom. The study has suggested that potential mushroom growers should be given training for its proper production. The government should promote production of mushroom in the rural areas through Self-Help Groups (SHGs). This will help create additional employment and income for rural people in the area.

## **Strategies for Egg Production in India**

**A. Amarender Reddy**

Administrative Staff College of India, Hyderabad, Andhra Pradesh

Compared with meat, poultry industry has registered a significant growth in India, which ranks fifth in the world with annual egg production of 1.61 million tonnes. However, egg processing is in the nascent stage in India and is mostly concentrated in southern states of the country. India exports egg powder, frozen egg yolk and albumin powder to Europe, Japan and other countries. While meat products have registered a growth of 10 per cent, eggs have registered 16-20 per cent growth in recent years. With diet diversification and rise in income, there is a good scope in expansion of egg consumption, through branding and consumer education. There are about 15 pure line and grandparent franchise projects in India. There are 115 layers, producing 1.3 million layer parents. They, in turn, supply 95-million hybrid layers. Presently, there are only five egg powder plants in India, which are considered insufficient in view of growing export demand for different kinds of egg powder — whole egg, yolk and albumin. The scope for foreign collaborations and dissemination of state-of-the-art technology in this field is tremendous. The paper has examined strategies for expansion of egg production and consumption in India through value-added egg products like branded eggs, vegetarian eggs, organic eggs, egg powder, etc. It has also examined interstate differences in egg consumption and demand and supply situation of eggs in India.

## **Demand and Supply Framework for Dairy Business Opportunities in India**

**B.S. Chandel and A.K. Chauhan**

Division of Dairy Economics, Statistics and Management, National Dairy  
Research Institute, Karnal - 132 001, Haryana

The demand for value-added dairy products (VADPs) is increasing at a fast rate in India. In the urban areas, the share in average per capita expenditure on milk and milk products from organized sector and unorganized sector has already attained approximately equal proportions. At present, VADPs from organized sector have been found to account for a high proportion in all dairy products, except liquid milk. The income elasticity for pasteurized packed milk has been found to be high, indicating huge future market for it. Besides income, other factors accelerating demand for VADPs are increased urbanization, growing power of supermarkets; concentration in the processing sector; different levels of value addition; increased segmentation of consumption and changes in eating habits. The present trend has shown that growth in dairy plants and their capacity will enhance market share of the organized sector in VADPs as well as reduce their cost of production by economies of scale. These results emanate at the licensing level, whereas nothing has been felt at the field level. The processing capacity registered under the MMPO (as of March, 2006) has already reached about 33 per cent of milk production and 63 per cent of the marketable surplus of the country. The registered milk processing capacity as percentage of per day milk production has attained saturation point in major states like Gujarat (57.92%), Karnataka (38.51%), Tamil Nadu (46.94%), Uttar Pradesh (40.12%) and Haryana (39.54%). The high milk producing states having lower installed milk processing capacity like Punjab (21.6%), Rajasthan (11.03%), Madhya Pradesh (21.77%), Bihar (4.94%) and West Bengal (19.52%) can provide better opportunities for future investments. A magnificent market exists for value-added dairy products. However, challenge for the dairy industry is to identify appropriate markets and focus its efforts on meeting the needs of consumers in these markets.

## **Value-addition in Dairy Products – A Case of Varieties of Processed Milk for Co-operative Dairy Plant in Tamil Nadu**

**N. Rangasamy<sup>1</sup> and J.P. Dhaka<sup>2</sup>**

<sup>1</sup>National Institute of Agricultural Marketing, Jaipur, Rajasthan

<sup>2</sup>National Dairy Research Institute, Karnal-132 001, Haryana

The marketing efficiency of different varieties of liquid milk has been worked out in a Co-operative Dairy Plant of Tamil Nadu, based on the data collected from this plant for the financial year 2001-2002. The marketing efficiency of selected liquid milk varieties have been worked out by Shepherd's formula and constraints faced by Co-operative Dairy Plant in milk procurement, processing and distribution of dairy products have been analyzed by tabular analysis method. The per litre marketing cost, marketing margin and marketing efficiency have been found respectively as Rs 3.32 , Re 0.58 and 0.17 for toned milk, Rs 3.48 , Re 0.79 and 0.23 for standardized milk, and Rs 4.12, Re 0.69 and 0.17, for full cream milk. The study has concluded that production of higher quantities of value-added dairy products like standardized milk is highly profitable and more market efficient than that of other dairy products to the dairy plant. The major constraints for Co-operative Dairy Plant have been identified as selling of milk to private milk vendors by some of the members; under-utilization of transport vehicles, chilling centres, and dairy plant at manufacturing level; and higher sales commission to the agents, wholesalers and retailers. There is a need to explore the possibility of increasing the marketing efficiency of toned milk and full cream milk by minimizing the identified constraints in the value-addition chain. The paper has suggested development of the co-operative dairy industry in a sustainable manner by formulating a long-term vision and effective strategy for sales promotion, quality control, and consumer-oriented market research and development.

## **Efficiency and Productivity Analysis of Business Firms in Dairy Processing**

**Sarvesh Kumar, Smita Sirohi and Jai Parkash Dhaka**

Dairy Economics, Statistics and Management Division, National Dairy Research Institute, Karnal – 132 001, Haryana

The favourable policy regime for boosting value-added dairy products and the buoyant national and international markets for such products have led to a substantial growth of private players in the business of dairy processing in India. This paper has analysed the growth trends in sales, value of output, investment, capital and labour productivity of firms in dairy processing, and has estimated their technical efficiency along with the factors affecting it. The study is based on the secondary data for the period 1991-92 to 2000-01 culled from the financial statements of 33 major private dairy firms, including five MNCs. Technical efficiency has been measured using the time varying stochastic frontier production function model. The sales performance of processing firms has been found quite encouraging, as 23 of the 33 firms have registered positive growth in sales and value of output. The productivity of capital and labour has also increased in about 60 per cent firms. However, the average technical efficiency scores (0.47) have been found on the lower side. Poor capacity utilization as captured through capital output ratio has emerged as an important factor causing inefficiencies in production. The study has concluded the critical element in enhancing the productivity and efficiency of Indian and MNCs is improved capacity utilization, which is possible only if more milk flows through the organized sector. For this, the firms need to provide support to the dairy farmers in terms of price incentives, quality feed input supply, regular veterinary services, etc. The establishment of such linkages between the dairy farmers and firms would go a long way in strengthening the business opportunities for both, milk producers and product manufacturers.

## **Performance and Prospects of Indian Poultry Sector**

**P. Nasurudeen, Anil Kuruvila and R. Sendhil**

Department of Agricultural Economics and Extension, Pandit Jawaharlal  
Nehru College of Agriculture and Research Institute,  
Karaikal - 609 603, Union Territory of Puducherry

The importance of livestock sector in the economy can be underpinned by the increasing share of the sector in the agricultural and total GDPs of the economy. The distinctive feature of the Indian poultry sector is its high productivity and competitiveness. This paper has assessed the performance and prospects of poultry sector in India. The share of four southern states, viz. Andhra Pradesh, Tamil Nadu, Karnataka and Kerala, which was about 37 per cent of production in 1992, has increased to about 46 per cent in 2003. Poultry meat has shown an increasing rate in production of about 10-11 per cent, though with high instability. The rural-urban differential in expenditure on meat, fish and eggs has been found to narrow down. Maize alone has accounted for about 50 per cent of the feed rations and the important issue is low productivity. With the exception of live poultry, all other categories of exports have witnessed a reasonable growth in the post-WTO period. One inherent characteristic of poultry exports is the high instability in all the periods, though it declined during the 1990s and the post-WTO period. The development of poultry value chain through investments, starting from production of maize and soyabean to distribution and retailing of poultry products in national and international markets need to be initiated for the sustainable growth of this sector.

## **Prospects for Fruit Industry in Karnataka through Value Addition — A Case Study of Grapes**

**C.N. Harish, R.S. Poddar, H. Basavaraja and L.B. Kunnal**  
Department of Agricultural Economics, University of Agricultural  
Sciences, Dharwad-580 005, Karnataka

Horticultural industry is a fast emerging sector which can contribute substantially for the growth of agribusiness in the country. Karnataka is one of the important states in horticulture sector in India as it occupies the third place in area and production of fruit crops. This paper has studied the prospects for fruit industry in Karnataka through value-addition in grapes using the CGR growth model to compute growth in their area, production and productivity. Grapes have shown a significantly high growth in acreage, both before and after the economic liberalization. However, growth in production has been found moderate because of a significant decline in yields. It has concluded that since processing of raw grapes into raisins results in value-addition, it should be promoted among the growers. This value-addition has tremendous potential of providing economic gains to the welfare of the farmers and farm economy of the region. The study has suggested that since production of grapes is expected to increase in the near future, the rise in the quantum of their processing needs the attention of policymakers and horticulturists.

## **Economics of Value Addition in Chillies — A Case Study in Guntur District of Andhra Pradesh**

**C.V. Hanumanthaiah and V.V. Satyanarayana**

Acharya N.G. Ranga Agricultural University, Regional Agriculture  
Research Station, Lam, Guntur-522 034, Andhra Pradesh

The present study, carried out in Guntur district of Andhra Pradesh, has estimated the additional investment involved in value-addition of chillies to produce a high quality economic product. The farmers have been found investing an additional amount of about Rs 1500/q at several stages of post-harvest processing with the main objectives of realizing a better and profitable price. The study has revealed that the crucial processing stages of additional investment for chillies are drying, grading, packing, storage and processing. Keeping produce in the cold storage has been found a common practice in and around Guntur district of Andhra district and it could fetch a premium price ranging from Rs 2500/q to Rs 8800/q during the year 2006-07.

## **Value-Addition of Sugarcane – A Case of Jaggery Production**

**M. Anjugam, K. Govindarajan, D. Suresh Kumar**

Department of Agricultural Economics, Tamil Nadu Agricultural University, Coimbatore-641 003, Tamil Nadu

The present study has analyzed the growth and performance of area, production and productivity of sugarcane, comparative economics of sugarcane and jaggery production and has identified the constraints in jaggery production. The study conducted in the western zone of Tamil Nadu, has revealed that the growth rates in area and production of sugarcane are positive during the post-liberalization period in India, Tamil Nadu state and the western zone of Tamil Nadu. However, the productivity of sugarcane has shown a negative growth rate in India and Tamil Nadu, which might be due to monsoon failure during this period. The productivity of cane in the western zone of Tamil Nadu has shown a low but positive growth rate, may be due to change in the cropping pattern and better access to sugar mills. Small and marginal farm households have been found involved in jaggery while registered growers supply cane to the sugar factory. The net income realized from jaggery production has been recorded as Rs 14138, which is higher than that farm the cane produced for sugar factory. Delays in cutting of cane by the sugar factories and labour problems during harvesting season have been found as the major reasons for jaggery making. Non-remunerative prices, lack of government support in price policies and traditional technology have been identified as the major constraints in jaggery production. The study has suggested that introduction of modern technologies, creation of infrastructure and formulation of appropriate price policies need be encouraged to enhance jaggery production among the farmers to get remunerative price for their produce.

## **Potential of Jatropha Bio-fuel: An Emerging Agribusiness Opportunity**

**Alka Singh, V.C.Mathur and G.K. Jha**

Division of Agricultural Economics, Indian Agricultural Research Institute,  
New Delhi-110 012

India, like other developing countries faces the complex challenge of pursuing economic growth, meeting growing energy needs and environmental protection. Globally, bio-diesel is emerging as an environment-friendly alternative fuel for meeting the energy requirements in a sustainable manner. The potential economic and environmental benefits of jatropha for biodiesel production have driven the Indian Government to adopt programmes to increase supply of feedstock and utilization of bio-diesel. This paper has analyzed India's initiatives for promotion of jatropha as feedstock for bio-diesel production as an alternative energy source and has evaluated opportunities and critical gaps across different components of supply chain that impede its sustainable progression. The paper has suggested some critical interventions required on technological, policy and institutional aspects to place the bio-diesel industry on a rapid growth track. It has concluded that the future of bio-diesel industry depends on the accelerated diffusion of new technologies, especially in the rural India, with an appropriate and market-friendly regulatory environment.

## **Agribusiness Opportunities in Promoting Vermicompost in Citrus Cultivation in Maharashtra**

**V. Ramamurthy, S.C. Ramaesh Kumar, L.G.K. Naidu,  
S. Vadivelu, A.K. Maji and V.N. Parhad**

Natioanl Bureau of Soil Survey and Land Use Planning, Regional Centre,  
Hebbal, Bangalore-560 024, Karnataka

Vermicomposting is gaining strong foothold among the farmers of Maharashtra due to its multifunctional roles and benefits in agriculture. The production and usage studies on vermicompost carried out under the Institute-Village Linkage Programme near Nagpur, Maharashtra, have clearly indicated that there is lot of scope to undertake vermicomposting as an agribusiness opportunity to meet its growing demand, especially in citrus crops. Vermicompost application has been found to improve the yield of citrus by 21 per cent, with B: C ratio of 3.21. The adoption rate has increased from 3 per cent to 28 per cent over five years. Economic analysis of vermicompost production under heap system has revealed that a farmer can get around Rs 46,000 net profit besides 33 human-days work per ha of citrus cultivation as additional employment. The rate of return of vermicompost has worked out to be 2.92. The economic viability of vermicompost production and its application to citrus has been estimated for Maharashtra, which has revealed a need of around 15.6 Mt of vermicompost, which will generate a net profit of around Rs 13 crores per annum by 2015. The study has projected that the additional net economic benefits by adopting vermicompost technology in citrus by the year 2015 will be of Rs 24.6 crores.

## **Rural Entrepreneurship Development for Generating Income and Employment: A Case Study of Agro-Processing Centre in Almora District**

**K. Srinivas, K.P. Singh, Ajay Kumar, S.R.K. Singh and  
K.K.S. Bisht**

Vivekanada Parvatiya Krishi Anusandhan Sansthan, Almora - 263 601,  
Uttarakhand

An action research was initiated by establishing an agro-processing centre (APC) at Takula village in the Almora district to develop entrepreneurship in unemployed educated youth. It has been found that APC could result in value-addition, processing and providing a regular source of income. The location of the APC was decided on the basis of availability of raw material, infrastructure and market. The selected entrepreneurs had most of the qualities of a good businessman. Initial investment in establishing an APC was Rs 250 thousands. After running the APC for almost two years, the average operational cost was Rs 3,50,686 and total return was Rs 4,34,913/- per year. Economic indicators, viz. net present value (Rs 3,59,815), internal rate of return (36.2%), benefit cost ratio (1.39) and pay back period (2.8 years) have revealed that APC can be a very good option for investment. Forward and backward linkages have been established and a fair degree of direct (2.5 FTE) and indirect employment have been generated. The APC has also generated farmers' interest in adopting new varieties and modern agro-techniques for enhancing yield, marketable surplus and income. The study has suggested replication of APC in other regions by taking proper care in selection of entrepreneur and location of the APC for a successful venture.

## **Growth, Instability and Export Performance of Chillies during Pre- and Post-Liberalization Periods**

**U. Arulanandhu, T. Alagumani, T. Samsai and P. Paramasivam**

Department of Agricultural Economics, Agricultural College and  
Research Institute, Tamil Nadu Agricultural University,  
Madurai, Tamil Nadu

Spices are the major export commodities from India and the trade policies influence the spice trade. In recent years, there have been ups and downs in export of important spices but a steady increase in some spices like chillies. The present study has been carried out to (i) study the area, production, productivity and export of chillies, (ii) assess the share of export of chillies in production, (iii) measure the growth and instability in the export of chillies during pre- and post-liberalization periods, and (iv) project the export of chillies. The secondary data related to annual export quantity, value and unit value for the period 1976-77 to 2005-06 have been collected and used for growth and instability analysis. The export quantity of chillies for the period of 36 years (1970-71 to 2005-06) has been used for projecting the export, using ARIMA models. Chillies export has shown a higher growth rate during post-liberalization than pre-liberalization period in terms of both quantity and value of chillies. The estimated instability index for chillies has revealed the trade to be highly unstable during the pre-liberalization period, but has been moderately stable during post-liberalisation period. The study has revealed that export of chillies would increase during the next five years, reaching 1,39,160 tonnes by 2010-11. The study has suggested that necessary infrastructure may be created to export huge quantities of chillies.

## **Export Opportunities and Challenges for Indian Organic Products**

**S.S. Kalamkar**

Gokhale Institute of Politics and Economics (Deemed University),  
Pune-411 004, Maharashtra

Organic farm production and trade has emerged as an important sector in India as in other parts of the developing world. The global market is growing steadily and is expected to reach US \$ 102 billion by 2010. More than 120 countries produce organic products and Australia is the lead country having about 12 million hectares area under organic management in 2007. However in India, the development has been rather slow due to several reasons; the major being higher emphasis to food security than food safety. Lack of a central agency to collect data on area under organic agriculture, different agencies have estimated area differently. As per SOEL-FiBL survey 2007, about 150790 hectare area is under organic agriculture, which accounts for 0.1 per cent of the total agriculture area; which is very low as compared to other countries. According to government statistics, the country produced only 14,000 tonnes of organic food products in 2002. India is exporting tea, cotton, cotton yarn and spices to Europe, US and Japan and export-volumes are looking up. India has enormous potential for organic farming using traditional wisdoms prevailing in the villages of India. The agro-climatic conditions and agricultural biodiversity are conducive to organic agriculture. The development of organic farming in India suffers from the problems of supply and demand uncertainties, appropriate processing technology, high cost of certification and inspection, and market development. Therefore, encouraging organic agriculture would require appropriate government policies to address some of these problems, especially during the initial stages. The opportunity in export of organic agricultural produce has to be tapped with adequate safeguard so that interests of small and marginal farmers are not jeopardized.

## **Leveraging Competitiveness of Indian Organic Produce at Global Platform: Issues, Challenges and Policy Options**

**Ashutosh Singh and B.K. Sikka**

College of Agribusiness Management, GB Pant University of Agriculture & Technology, Pantnagar-263 415, Uttarakhand

The world is witnessing a great demand for the organic food products after the reports of harmful residual effects of chemicals in the agricultural practices. The organic food industry in the world is worth US \$ 35 billion with a growth rate of 15 per cent, with most of the growth concentrated mainly in USA, UK and Japan. India is endowed with 9 different agro-climatic zones and possesses a vast opportunity for entering into the international market with its organic produce. However, the road is not easy because the challenges in international marketing of organic food have been identified as standardization of products according to the customers' tastes and preferences, certification, consumer education, branding and promotion, etc. The present study is based on the strategic analysis of Indian organic product industry with respect to global markets. Through SWOT analysis and TOWS matrix, the study has highlighted the opportunities and threats existing in the global markets and strategies to develop markets worldwide for India.

## **Recent Developments in the Farmer- Market Linkages of Agri-Business in Gujarat**

**Anita Arya**

Sardar Patel Institute of Economic and Social Research,  
Ahmedabad-380 054, Gujarat

There is a need to encourage food processing and agricultural marketing with a view to reducing post-harvest loss. This paper has outlined recent developments in farmer-market linkages of agri-business in Gujarat. According to this study, the Gujarat agricultural landscape is going through an unprecedented change. Value-added crops such as lemon grass, super cash crops like herbal plantations, cashew nuts and organic vegetables and fruits are replacing the conventional crops like wheat, bajara, cotton and groundnut. The Gujarat Government is finding ways of marketing of these new products. Rabo India has been appointed by the State Ministry of Agriculture to review the action plan for mapping market linkages (food parks, AEZs, processing facilities, pack houses, cold storages and mandies). *Krishi Mahotsav* is being organized where the primary processors are made aware of the benefits of liberalization and globalization. A recent *Krishi Mahotsav* focused on value addition and market linkages. More than 8000 farmers would be sensitized to value-addition techniques and setting up of small agro-processing units in Jyotigarm villages. The development of Dholera port will aid the development of agro-industries around Ahmedabad city and north of Gujarat. The state government is following up with the centre for setting up a cargo complex for perishable food commodities. The central government has also set up a Horticulture Mission Board in Ahmedabad to promote the present capacity of the processing units. Big corporate houses such as Welspun, and Godrej Agrovet are exploring possibilities of contract farming in Gujarat.

## **Organised Retailing: Reshaping the Indian Agribusiness**

**P. Kataria and S.S. Chahal**

Department of Economics, Punjab Agricultural University,  
Ludhiana-141 004, Punjab

The food and grocery segment, accounting for nearly two-thirds of the retail trade with meager one per cent under organised retail, holds promises as well as challenges for all those along the food supply chain. This article has delved into different dimensions of organised retailing, particularly in case of food retailing with a view to assess its role in reshaping the Indian agribusiness. The article has conclusively established that the proposal of organised retailing is a win-win situation for every stakeholder of the supply chain, starting from farmer to end-consumer. The increased penetration of organised retail into the food & grocery (F&G) segment can improve the efficiency of the supply chain and boost farm incomes. The study has predicted that higher farm incomes can go a long way in improving the lot of 60 per cent rural population of the country.

## **Scanning of Environment for Indian Agribusiness: Some Interventions for Promising Future**

**Raka Saxena, M.L. Sharma, Sohiti Satyawali and Vivek Mittal**  
College of Agribusiness Management, G.B. Pant University of Agriculture  
and Technology, Pantnagar-263 145, Uttarakhand

Today agribusiness has become one of the important sectors in the developing countries to boost up their economies and meeting globalization opportunities and challenges. This paper has scanned the Indian agribusiness environment and its growth prospects at a time when Indian agribusiness sector is poised to make giant strides, leading India to the class of developed and food surplus nations. Despite all the favourable policy initiatives from the government, India still lags behind in terms of global comparisons of productivity, minimization of post-harvest losses and extent of value addition/ food processing. The paper has shown the need for backward and forward integrations across the whole value chain. Moreover, development of adequate market infrastructure, easy access to credit, and availability of technical know-how become imperative with goal of development of India. The essentiality of PPP (public-private partnership), therefore, can't be ignored as it will be the key towards development of Indian agribusiness sector. The paper has highlighted the need to strengthen and integrate the domestic marketing system. Direct marketing should be encouraged. Further, there is a need for amendment of APMC Act in tune with Model Act in all the states for establishing private markets and contract farming. Special markets are required for specific commodities. The study has stressed on cutting of unnecessary procedures and reduction in the number of bureaucrats with whom entrepreneurs have to interact.

## **A Study on Contribution of Agriculture to Indian Industry**

**S.S. Raju**

National Centre for Agricultural Economics and Policy Research  
(NCAP), New Delhi-110 012

This paper has assessed the contribution of agriculture to Indian industry through supply of raw materials and demand for inputs. The selected industries are of two categories, namely major industry group (organized sector) and small-scale and household industries (unorganised sector). It has been found that the number of factories under major industry group is 45045, which employ about 31.89 lakh persons. The largest number of persons have been found engaged in the manufacture of food products and beverages. In the small-scale and household industries, one crore people are estimated to be engaged. The paper has also analysed the existing situation with regard to the agro-based industries and has stressed on the importance of diversification of industries based on agriculture. Various possibilities in the industrial use of important crops and livestock have also been discussed. The study has suggested research thrusts for a wider diversification of industries and various steps for planning and promotion of agro-industries in the country.

## **Agribusiness Opportunities for Davana (*Artemesia pallens*) in Bangalore Region**

**Rajendra Hegde, S.C. Ramesh Kumar and V. Ramamurthy**  
National Bureau of Soil Survey and Land Use Planning, Hebbal,  
Bangalore-560 024, Karnataka

High quality essential oil yielding herbs require specific agro-climatic conditions for their successful cultivation. Due to the availability of wide variety of such conditions, India offers great scope for producing and exporting such produces. Nearly 2000 such herbs are produced in India. Davana (*Artemesia pallens*) is one such crop, which offers bright agribusiness opportunities for both farmers and processing industries. Davana requires rich red loams and rain-free bright sunny days to produce high oil yield. Such conditions prevail in the Eastern dry zone represented by Bangalore. A field study conducted at farmers fields has proved that this crop can be successfully cultivated in the Bangalore region and has potential to yield a net profit of Rs 40,000/- per ha for farmers in about 100 days. Crop is free from pests and non-degrading environment. The study has found that costs on labour and watering are the main components of production. The major constraint in the region is declining watertable, as crop also requires intensive irrigation. Crop requirements, scope for area expansion, export market, SWOT analysis, agencies involved in trade and government interventions have all been discussed in this paper.

## **Challenges and Opportunities of Agri-business as an Option for Enhanced Household Income and Employment in Rajasthan**

**K.A. Varghese, Latika Sharma and S.S. Burark**  
Department of Agricultural Economics & Management,  
MPUAT, Udaipur, Rajasthan

The diversified crop mix with commercial orientation and livestock composition with stable milk and meat supply are the major strengths of agriculture sector in Rajasthan for promoting agribusiness. The large increase in the number of male and female marginal workers with sub-optimal workdays is indicative of the need to develop agro-processing value-addition and other agro-based activities in the state. The low level of household income of farm families, specially for small and marginal classes warrants the need to diversify the sources of income of rural households. The large share of exportable as well as processable agricultural commodities in the crop mix of the state as well as traditional agro-processing activities of pulses, oilseeds, etc. will have to be further strengthened with business orientation. The increasing demand for agricultural inputs like farm machines, seeds, fertilizers, agro-chemicals, etc. has opened up avenues for more employment in the state. The newly emerging areas such as hi-tech horticulture, organic farming, and contract farming in selected areas are also expected to support and promote agri-business activities in the state. Scientific planning with policy support, by taking into account the strength, weakness, opportunities and threats of crucial components like human and land resources, infrastructure, crops and livestock activities as well as institutional set up for research and extension would lead to project the state of Rajasthan as one of the major players in the agri-business sector of the country.

## **Integrated Agribusiness Model in Public Sector: A Case Study of Instructional Dairy Farm, Pantnagar**

**V.P.S. Arora, Vandana Dhyani and Saurabh Singh**

College of Agribusiness Management, G B Pant University of Agriculture  
and Technology, Pantnagar- 263145, Uttarakhand

Many state governments are developing agribusiness models with the help of state agricultural universities. G B Pant University (Pantnagar) is one of the universities that have initiated agribusiness activities. It had started commercial seed production on 10000-acre farm in 1960; launched a seed company in 1969; and has now launched agribusiness model on its Instructional Dairy Farm. The farm has 13 units that are closely interrelated to each other. Out of these 13 units, two units on vermicompost and fodder bank have been developed recently. The unit is conducting all the livestock farming activities on commercial lines. The present study has evaluated this agribusiness model. It has been found that the model is working very well and is worth replicating. The model has also showcased the successful establishment of agribusiness unit on public-private and NGO relationship mode.

## **Restructuring Agricultural Education for Agribusiness Development**

**P. S. Badal, Pramod Kumar and Chandra Sen**

Department of Agricultural Economics, Banaras Hindu University,  
Varanasi-221 005, Uttar Pradesh

There exists a training gap between the actual and desired levels of technical and managerial skills among the farmers required for the promotion of agribusiness and agro-industry in rural India. A study, conducted in rural areas of Delhi in 2003, has shown that financial management and marketing management are the two important areas where farmers need training. It simply justifies the premise that a greater emphasis should be given on the business component of agricultural education. Institutions engaged in imparting farm education and training should reorient their curricula to develop human resources for agribusiness and self-employment. These programmes should be developed based on specific characteristics of local resources and labour requirements. It is high time that students of agriculture are given strong business orientation through appropriate courses in business management and entrepreneurship development to empower them to take up self-employment. SAUs can play a major role in this direction as they have strong first hand experience of rural problems on one hand and a strong network of multidisciplinary experts on the other. Focussed efforts are also required to create a strong interface between SAUs and industry in development of course curriculum, providing internship opportunities and on-campus recruitments in agro-based industries.

## **Agribusiness Prospecting for Grape Cultivation Using Land Resource Information**

**S.C. Ramesh Kumar, V. Ramamurthy S. Vadivelu, L.G.K. Naidu,  
Rajendra Hegde and S.Srinivas**

National Bureau of Soil Survey and Land Use Planning, Regional Centre,  
Hebbal, Bangalore 560 024, Karnataka

The study has been conducted with the objectives of agribusiness prospecting for grape cultivation by characterization, mapping of soils, studying of land use requirements, evaluating the economic viability of grape cultivation and delineating the potential area for grape in Rajanukunte watershed. The soil survey and mapping have resulted in delineation of seven soils series, one on the mound, one in the valley and five on the pediment surface. The land-use requirement of grape has been matched with land qualities for delineating the potential areas. The temperature, relative humidity, soil texture, depth, pH, drainage and gravel content have been used in suitability evaluation. The rainfall and humidity during flowering and fruiting period have been suitable, with the added advantage of nearness to market in Bangalore city. The suitability assessment has shown that about 48.5 ha of land (8.58%) in the watershed is marginally suited, about 242.42 ha of land (42.91%) is moderately suited and 149.73 ha (26.5%) is highly suitable for grape cultivation. Evaluation of investment in grape vineyards has revealed the net present value as Rs 357512/ha, the pay back period as 3 years and internal rate of returns as 40 per cent. The investment in grape vineyards has been found financially viable. The suitability evaluation has revealed that characteristics like pH, gravels and drainage are the major soil limitations. However, as the crop is perennial and widely spaced, the limitations can be overcome by soil manipulation and input management.

## **Impact of Shelterbelts on Net Returns from Agricultural Production in Arid Western Rajasthan**

**B.L. Gajja, Rajendra Prasad, R.S. Mertia and J.S. Samra**  
Central Arid Zone Research Institute, RRS, Jaisalmer, Rajasthan

The shelterbelt is considered to be the most important technology to minimize erosion hazards of speedy winds and optimize agricultural production. The introduction of Indira Gandhi Nahar Pariyojna (IGNP) and development of tubewells covering 50,000 ha area in Lathi series have prospected to provide assured irrigation facilities. In this paper, the impact of shelterbelt on agricultural returns has been studied. Since land allotment in IGNP was made on the basis of 'MURBA', which is equivalent to 5 ha, it was considered as farm unit in this study. The primary data have been collected from 80 farmers each from shelterbelt and non-shelterbelt, selected randomly from tubewell and canal command area of IGNP Phase -II in Mohangarh tehsil of Jaisalmer district. Separate production functions have been estimated for shelterbelt and non-shelterbelt farmers to decompose total change in net returns. The study has revealed 430.8 per cent increase in net returns due to shelterbelt plantation, in which shelterbelt technology has contributed 399.4 per cent and 31.4 per cent has been due to increase in use of complementary inputs. Out of 399.4 per cent, shelterbelt itself has accounted for 305.6 per cent, i.e. by shifting from non-shelterbelt to shelterbelt and remaining 93.8 per cent at the level of inputs used by non-shelterbelt which might be due to improvement in soil properties.

## **Constraints Faced by Farmers in Mulberry Cultivation and Silkworm Rearing of Sangli District in Maharashtra**

**M.S. Jadhav and A.P. Karjule**

Department of Agricultural Economics, MPKV,  
Rahuri-413 722, Maharashtra

India is the second large country in the world in producing silk. In the state of Maharashtra, “Khadi Gramodyog and Village Industries Board” provides buy back intervention. With its network in 29 districts in Maharashtra, it provides input services like timely supply of planting material, disease-free laying, training to farmers, supplying of sericulture equipments and medicines and assured and remunerative marketing. Presently, there are 38 trading units in the state for the purchase of cocoon. This study has identified constraints faced by sericulture farm owners by collecting data during the year 2005-06 from Walwa and Sharala tehsils of Sangli district. The farmers of these two tehsils do the business of mulberry cultivation and silkworm rearing. The rearing of silkworm is done by 17 farmers in the total area of 5 hectares. The analysis has been done by simple tabular method.

The study has identified four types of constraints faced by the silkworm rearing farmers: (i) non-availability of rearing equipments in time (86.67% farmers), (ii) temperature and humidity (86.67% farmers), (iii) high costs of manure, fertilizer and construction of rearing house (93.33 farmers), and (iv) fast deterioration in quality of cocoon (86.67% farmers). For overcoming of these constraints, the following suggestions have been given: (i) purchase rate of cocoon should be increased (100% farmers), (ii) amount of subsidy should be increased (93.3% farmers), and (iii) trading units for purchase of cocoon should be within 20-km distance (80% farmer). These felt-needs of the farmers should be taken care of by different agencies and the government.