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Marketing of Fresh Mushroom in Haryana

—R. K. KHATKAR*, A. K. RATHEE AND V. K. SINGH

Mushrooms have been recognised by Food and Agriculture Organisation (FAO) as food item contributing to the protein nutrient to the diet of developing countries like India, where there is heavy dependence on cereal diets. The significant feature of mushroom is that this nutritious and tasteful food is cultivated entirely from waste products and converts a wide spectrum of agricultural and industrial waste into substrate on which the growth of mushroom is supported. After harvesting the mushroom, the solid residual left is organic compost with natural nutrients to further enrich the soil. Haryana State is producing about 4000 tonnes of mushroom. Being in close vicinity to the National Capital *i.e.* Delhi. Haryana State is having high potential for mushroom cultivation.

In addition to converting the waste into valuable product, it enhances the income and provides additional gainful employment to the producers. Although, there are some studies on cost of production and marketing aspects of mushroom in other parts of country *viz.* Deshmukh (1997), Kumar *et al.*, (1995), Savithri *et al.*, (1997), Singh and Chaube (1995) and Singh and Kalra (1995), yet there is a scope to conduct in depth study on these aspects in Haryana State.

Keeping in view the increasing demand of mushroom due to globalisation and opening of the economy, it is essential to work out the economics of mushroom cultivation and marketing to complete in the international market. Thus, in this article an attempt has been made to analyse the cost of cultivation and marketing margins and costs of mushroom.

Methodology

The required primary data pertaining to cost, yield and prices for the year 2001-02 were collected from the selected 30 mushroom growers scattered in five villages of Sonapat district in Haryana. The marketing costs and margin data were collected from the Azadpur (Delhi) market. The data pertaining to processing costs were collected from one selected Kayt's. Tabular analysis was done to draw inferences.

RESULTS AND DISCUSSION

A. Cost and return

The data depicted in Table-1 reveals that cost of production per kg of mushroom was found Rs. 22.30. The producer can get net return of Rs. 13.70 by selling one kg mushroom at the rate of Rs. 36 per kg. The variable cost

constituted 82.20 per cent of the total cost and 17.80 per cent as fixed cost. Wheat Bhusa (21.01%), labour charges (14.08%), polythene sheets (10.59%), chemical fertilizers and chokkar (10.45%) and spawn (9.94%) were found major constituents of variable cost. The producer can earn net return of Rs. 21654 by incurring Rs. 56880 total expenses by growing mushroom on 40 q. Wheat Bhusa or 50×23 sq. ft. area of five tier system. More than one benefit cost ratio of 1:1.61 indicated that this enterprise is economically viable. These findings are in confirmity with the findings of Deshmukh *et al.*, (2001) :—

Table-1

Costs and returns from mushroom production (40 q. Wheat Bhusa or 50×23 sq. ft. five tier system)

Item	Cost/return (Rs.)	% age to total cost
A. Fixed cost :		
Depreciation on shed and equipment and interest on fixed capital @ 14%	6272	17.80
B. Variable cost :	28954	82.20
(i) Wheat Bhusa (40 q. @ Rs. 185/q)	7400	21.01
(ii) Chemical fertilizers and chokkar	3680	10.45
(iii) Insecticides and pesticides	1270	3.60
(iv) Polythene sheets etc.	3730	10.59
(v) Spawn (70 bags @ 50/bag)	3500	9.94
(vi) Casing soil (FYM)	1420	4.03
(vii) Electricity charges	1100	3.12
(viii) Labour charges	4960	14.08
(ix) Interest on working capital @ 14% for 6 months	1894	5.38
C. Total cost (A+B)	35226	100.00
D. Production (kg)	1580	—
E. Gross return (@ Rs. 36/kg sale price)	56880	—
F. Net return (E-C)	21654	—
G. Cost of production per kg (C÷D)	22.30	—
H. Net return/kg (36—22.30)	13.70	—
I. Benefit-cost ratio (E÷C)	1:1.61	—

B. Marketing cost, margin and price spread

(i) *Fresh mushroom* : The data presented in Table-2 reveals that producer's share in consumer rupee is 60 per cent by selling fresh mushroom. The wholesalers and retailers are taking away the major share of 3 per cent and

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31.67 per cent of consumer's price without investing any penny in the marketing process. All the expenses in the marketing process are incurred by the producer. Practically the retailer or buyer charges paid to mandi are also charged from the producer.

Table-2
Marketing cost, margin and price spread of fresh mushroom

Item	Rupees (Kg.)	% age share to consumer rupee
A. Farmer's sale price	36.00	60.00
B. Marketing costs :		
(i) Wholesaler's commission (@5%)	1.80	3.00
(ii) Retailer/Buyer's charges paid to the mandi (@ Rs. 2/kg.)	2.00	3.33
(iii) Market fee and transportation	1.20	2.00
C. Retailers purchase price	41.00	68.33
D. Retailer's margin	19.00	31.67
E. Consumer's purchase price or Retailer's sale price	60.00	100.00

(ii) *Processed mushroom* : It is obviously clear from the data depicted in Table-3 that producer's share in consumer's rupee is reduced to about 28 per cent in case of value added (processed) sale of mushroom. The processor's and retailers margin constituted about 14 per cent and 31 per cent to consumer's rupee respectively. The processor is incurring about 19 per cent and retailer is incurring about 7 per cent of consumer's price to pocket the lion's share of consumer's rupee.

Table-3
Marketing cost, margin and price spread of processed (value added) mushroom

Item	Rupees (Kg.)	% age share to consumer rupee
1	2	3
A. Producer's sale price	32.00	28.45
B. Material cost or processing charges (labour, cleaning, bleaching, electricity etc.)	7.50	6.67

	1	2	3
C. Cost of pack (Tin) and packing		12.50	11.11
D. Sale tax (@ 4%)		2.00	1.78
E. Processor's margin		16.00	14.22
F. Sale price of processor or purchase price of retailer		70.00	62.23
G. Tax and octroi charges etc.		7.00	6.22
H. Transportation and handling charges		1.00	0.89
I. Retailer's margin		34.50	30.67
J. Purchase price of consumer or sale price of retailer		112.50	100.00

Conclusion

Mushroom cultivation is economically viable enterprise. It provides gainful employment to the under employed farmers in addition to additional income generation. The major share of consumer's rupee is pocketed by the middlemen. Thus cooperative marketing and processing should be encouraged to increase the producer's share in consumer's rupee. Government intervention is also necessary to safeguard the interest of farmers.

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Marketing Costs and Margins of Agricultural Produce in Tripura

—KIRAN SANKAR CHAKRABORTY*

There is perhaps no scope for any disagreement that in an industrially backward state like Tripura, accelerated growth of agricultural production is a crucial necessity for its development. At the same time, it cannot be denied that effective "marketing of agricultural produces" are supposed to bring augmentation as well as diversification of agricultural produce and thereby enabling the rural cultivators to make economic gains (Agarwal, 1988). Agriculture and allied activities in Tripura contribute nearly 45 per cent to 50 per cent of state income and provide livelihood to about 70 per cent of the state population. Therefore, the marketing costs and margins of agricultural produce in Tripura cannot simply be ignored but requires special attention for the economic development of the state.

Marketing costs and margins—Meaning and significance

Marketing costs are the actual expenses incurred in the marketing process. They include not only the cost of performing the various marketing functions, but different levies as well. The costs of performing the marketing function include transportation cost, labour charges, packaging, storing processing etc. Marketing margins are actual amounts received by the marketing agencies in the marketing process (Moore, Johl and Khusro, 1973).

The marketing margin between the cultivator and the consumer may be taken as an index of the soundness of the marketing set up of any produce (Gopaldaswamy, 1977). A number of studies stand to confirm that a large number of middlemen function at various stages of agricultural marketing in India and they reduce the share of the consumer's price (Krishnaswamy, Hari Narayan and Vijay Kumar, 1968). The price spread in Indian market is thus considerable and the cultivator's share of the consumer's rupee is very small. Retailers and wholesalers together often grab as much as 40 paise out of every rupee paid by the consumer. (M. C. Munshi, 1957). This highlights the high marketing cost and relatively high marketing costs indicate the inefficient market pattern.

The Present Study

Tripura has, in fact, two types of cultivation in the two district topographical regions. One-third of the population, the tribesmen mainly dwell in the hills and sustain living by a primitive method of cultivation known locally as 'Jhum'. The rest of the rural population live on the plains and practice settled cultivation with semi-modern or modern techniques.

The market arrivals of agricultural produce in Tripura may broadly be grouped as foodgrains, vegetables and fruits. Paddy-rice constitutes the major share in foodgrains. Vegetables include the various kinds of vegetables consumed and fruits include locally available fruits like banana, jackfruit, pineapple, woodapple, lichi, etc. The market share of other agricultural produces are negligible and their market arrivals are also irregular.

So far as market scenario is concerned, there are at present, altogether 564 markets in the state, of which 474 are primary markets and 83 are wholesale assembling markets and 7 municipal markets. The state has 21 regulated markets and only 1 terminal market situated at the state capital, Agartala.

In the above backdrop, the present discourse is an attempt to assess the marketing costs and margins of agricultural produces in Tripura. The object of the study is to estimate the average marketing costs and margins of marketing agencies in consumer price of paddy rice, vegetables and fruits. The hypothesis of the study is that the cultivators of the state are deprived of adequate margin in the consumer price of their produces. The study is based on the extensive survey made in a few selected regulated markets of Tripura done in connection with an UGC sponsored Minor Research Project. In the present study, out of 21 regulated markets, five markets namely Bishalgarh, Sonamura, Garjee, Nutan Bazar and Kulai are considered as sample regulated markets to assess the marketing costs and margins. Though the transportation of agricultural produces from the above mentioned markets to the state's only terminal market Agartala occupies a sizeable share, it may not give a general view of the state. Moreover, the study relates to a certain number of transactions made during the year 1999-2000. In dealing with the issues the study relies upon the opinions perceived on the basis of discussions made with cultivators, cultivator-cum-traders consumers, middlemen, arhyatdars, dealers, transport operators and other persons involved in the marketing process of sample markets. Prices of agricultural produces at sub-divisional level and at terminal market level have also been cross checked to arrive at consumer's price.

Findings and Discussion

The marketing costs and margins involved in transactions of agricultural produces i.e., paddy-rice, vegetables and fruits, in sample markets are presented in Tables I, II and III.

*Regional Director, IGNOU Regional Centre, Agartala.

It is evident from the table-I that cultivator's average share in consumer's price in the sample markets varies between 79.56 to 82.05 per cent in case of paddy-rice marketing. While the Miller's or wholesaler's margin varies between 3.91 and 5.13 per cent in consumer's price. Therefore, it can be said that the retailers and wholesalers consume as much as 7.66 to 8.88 per cent with a total average of 8.08 per cent of consumer's price. Transport charges, in rice marketing are also not much significant except in case of Nutan Bazar to Agartala, which is quite high. However, processing charges, which include milling, boiling, cleaning etc. considerably contribute to total price. Other marketing expenses like packing, commission to local touts, tolls, rent, storage, etc. are relatively low in case of marketing from Garjee to Agartala. The figures are in relation to 40 transactions in Bishalgarh, 48 transactions in Sonamura, 26 transactions in Garjee, 17 transactions in Nutan Bazar and 37 transactions in Kulai market respectively.

Table-II shows the vegetable marketing costs and margins involved in marketing process from the five regulated markets to the terminal market at Agartala. It is shown in the table that the farmer's share in the consumer's price in these markets lies between 44.38 to 54.63 per cent with a total average of 50.51 per cent only. Therefore, it can be stated

that nearly 50 per cent of every rupee in price goes to marketing set up including transportation cost. Wholesaler's margin lies between 15.77 and 23.07 per cent (total average 17.93 per cent). Another feature in case of vegetable marketing is the presence of local arhyatdar or commission agent who collects vegetables either from the markets or directly from the farmers. He maintains liaison between the wholesaler and the farmer. His average estimated margin is 5.72 per cent in Bishalgarh, 8.74 per cent in Sonamura market, 6.11 per cent in Kulai market, 4.68 per cent in Garjee market and 4.09 per cent in Nutan Bazar market. The retailer's margin is estimated as 19 per cent in consumer price. Middlemen's share in consumer price thus comes to nearly 42 per cent of consumer's price. Transportation charges are comparatively high in case of Nutan Bazar. Marketing expenses, including rent, tolls, packing etc. lie between 1.13 and 1.80 per cent of consumer's price, while loading, unloading and other labour charges are between 0.79 and 1.11 per cent of Consumer's price.

Table-III depicts the average fruit marketing costs and margin involved in transactions in sample regulated markets to the terminal market. The figures are in relation to 152 transactions in Sonamura, 100 in Bishalgarh,

Table-I

Average Paddy-Rice Marketing Costs and Margins involved in Transactions in Sample Regulated Markets to Terminal Market (Agartala)

(in percentage)

ITEMS	REGULATED MARKETS TO AGARTALA					AVERAGE
	Bishalgarh	Sonamura	Garjee	Nutan Bazar	Kulai	
	1	2	3	4	5	
(1) Processing charges (Milling/boiling/cleaning etc.)	7.48	6.82	5.42	5.62	6.25	6.32
(2) Transport charges	1.72	2.04	1.87	3.12	2.50	2.25
(3) Loading, unloading and other labour charges	1.52	1.41	1.36	1.00	1.25	1.31
(4) Other marketing expenses (packing/commission/tools/stores etc.)	0.98	1.01	1.02	1.62	1.56	1.24
(5) Miller's or whole seller's margin.	4.00	3.91	4.53	4.07	5.13	4.33
(6) Retailer's margin	3.75	3.75	3.75	3.75	3.75	3.75
(7) Cultivator's share	80.55	81.06	82.05	80.82	79.56	80.80
(8) Consumer's price	100	100	100	100	100	100
Based on Number of Transactions	40	48	26	17	37	33.60

Source : Field Study

* Includes variety of paddy-rice and Jhum rice.

** Excludes holding cost and hence increased margins.

*** During the period 1999-2000.

**** Consumer's price are taken at terminal market i.e. Agartala, consisting of seven municipal markets. Hence retailer's margin are same in all cases.

Table-II**Average Vegetables Marketing Costs and Margins involved in Transactions in Sample Regulated Markets to Terminal Market (Agartala)**

(in percentage)

ITEMS	REGULATED MARKETS TO AGARTALA					AVERAGE
	Bishalgarh	Sonamura	Garjee	Nutan Bazar	Kulai	
	1	2	3	4	5	
(1) Transportation charges	1.80	2.07	3.03	5.88	3.96	3.35
(2) Loading, unloading and other labour charge	1.03	0.94	1.11	0.79	0.98	0.97
(3) Marketing expenses (Stores/tools/packaging etc.)	1.53	1.80	1.13	1.19	1.22	1.37
(4) Arhyatdar's Margin	5.72	8.74	4.68	4.09	6.11	5.87
(5) Wholesaler's margin	17.00	23.07	16.42	17.41	15.77	17.93
(6) Retailer's margin	19.00	19.00	19.00	19.00	19.00	19.00
(7) Farmers share	53.92	44.38	54.63	51.64	52.96	50.51
(8) Consumer's price	100	100	100	100	100	100
Based on Number of Transactions	119	131	63	44	71	85.6

Source : Field Study

* Includes variety of non-storable perishable vegetables.

** During the period 1999-2000.

*** Consumer's price are taken at terminal market i.e. Agartala, consisting of seven municipal markets. Hence retailer's margin are same in all cases.

Table-III**Average Fruits Marketing Costs and Margins involved in Transactions in Sample Regulated Markets to Terminal Market (Agartala)**

(in percentage)

ITEMS	REGULATED MARKETS TO AGARTALA					AVERAGE
	Sonamura	Bishalgarh	Kulai	Nutan Bazar	Garjee	
	1	2	3	4	5	
(1) Transportation charges	2.68	0.98	4.02	4.90	3.35	3.19
(2) Loading, unloading and other labour charges	1.00	1.09	1.20	1.31	1.49	1.22
(3) Marketing expenses (Stores/tools/packing etc.)	2.63	2.04	3.18	2.44	2.82	2.62
(4) Wholeseller's Margin	32.74	28.10	39.75	38.00	43.14	36.35
(5) Retailer's margin	22.00	22.00	22.00	22.00	22.00	22.00
(6) Farmers share	38.95	45.79	29.85	31.35	27.20	34.62
(7) Consumer's price	100	100	100	100	100	100
Based on Number of Transactions	152	100	109	102	176	100

Source : Field Study

* Includes locally marketed fruits like Banana, Jack-fruit, Pineapple, Woodapple, Lichi etc.

** During the period 1999-2000.

*** Consumer's price are taken at terminal market i.e. Agartala, consisting of seven municipal markets. Hence retailer's margin are same in all cases.

109 in Kulai, 102 in Nutan Bazar and 176 in Garjee. The table shows that the farmer's margin in consumer's price on an average is 34.62 per cent varying between 27.20 per cent and 45.79 per cent among the selected regulated markets. On the other hand, middleman's margin (local karbari/Wholesaler and retailer's margin together) is 58.35 per cent. It is to be mentioned that on an average only one-third of the consumer's price goes to the farmer while the middleman's margin is much higher than the farmer's share. The retailer's margin is the same in all cases.

In the marketing of agricultural produce the farmer has been the price taker in all cases. Therefore, if the farmer's share in the consumer's price is inadequate he will not be encouraged for further production. The hypothesis of the study was that the cultivators are deprived of adequate margin in consumer price. However, it appears from the above mentioned tables that the paddy-rice farmers of the sample regulated markets get comparatively better margin in consumer price followed by vegetable farmers and fruit farmers. In case of paddy-rice marketing in sample regulated markets it is seen that the farmer's share in consumer's price is around 80 per cent, which speaks the presence of comparatively strong marketing set up. While, in case of vegetable marketing it is found that the farmer's share is around 50 per cent, and in that of fruit marketing it is only 34.62 per cent. Comparatively better margin of cultivators in the price of paddy-rice may be attributed to commercial production, government policy, locally suited quality, market arrivals of rice from other states with higher transportation cost due to its geographical location, etc. In this context it may be mentioned that most of the necessary goods are supplied to the sample regulated markets from the terminal market (Agartala) by the only mode of transportation, trucks. These trucks often have to return empty and at times are hired by traders or cultivators of paddy-rice at a nominal charge. It is observed during the field survey in sample markets that other major foodgrain produces and cash crops are marketed in exchange of inadequate farmer's margin under unfavourable market conditions. As the flow of agricultural produce is towards the only terminal market in Agartala, retailer's margin in all cases are same in the marketing of respective agricultural produce.

Concluding Remarks

The cultivator's poor economic condition resulting in distress sale of agricultural produce is perhaps the foremost cause of defective marketing, particularly in case of fruit and vegetable marketing. It may be mentioned that out of total 3,18,212 operational holdings in the state, there are 2,16,826 marginal holdings (i.e. below 1.00 hectare) and 69,217 small holdings (i.e. between 1.00 and 2.00 hectares). On the other hand, there are only 166 large holdings (i.e. above 10 hectares) in the state. Thus, it implies that sale of agricultural produce in rural markets of Tripura are

dominated by marginal and small cultivators. Moreover, commercial production of agricultural produce like fruit and vegetables except a few are still lacking in rural areas. Therefore, it is very difficult to identify any market for any specific produce on a large scale and commercial basis. Thus collection of produce from different locality involves local arhyatdars or agents which further deduct consumer's price.

Majority of the population of the state is below poverty line and live in rural areas. About 43 per cent of its total population come from relatively backward scheduled tribe and scheduled caste communities, basically depending upon agriculture and shifting cultivation. Therefore, effective agricultural marketing in the state is essential for overall development of the people of Tripura. Unless adequate care in agricultural marketing is taken, it is very difficult to think in terms of development. The basic issue that arises is whether the price leaves the farmers enough margin to induce him to produce more. Adequate market and marketing facilities can probably be the appropriate answer to this question.

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**'AGMARK' STANDS FOR PURITY AND QUALITY
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Marketing Costs and Price Spread for Marigold Flower in Haryana

—ASHOK DHILLON¹, R. K. KHATKAR² AND ARUN KUMAR³

Introduction

Flowers happen to be a very important part of our social system. The arrival of new born in the family is rejoiced with flowers, the sick are wished speedy recovery by offering flowers, while the dead are bedden farewell with flowers along-with tears of sorrows. Flowers are extensively used for decoration. Flowers are also largely grown for cut flowers, making essential oils, water, gulkand, perfumes and medicines, etc. The flowers can be grouped under two categories i.e. cut flowers and traditional flowers. The major traditional flower crops cultivated are rose, marigold, chrysanthemum, jasmine, aster, while rose, gladiolus, carnation, tuberose and orchids are the main flower crops for cut flowers.

Today, floriculture as a farm enterprise has emerged one of the most lucrative business profession in many countries having much higher potential of returns in comparison to most of the field plantations and horticultural crops. The total estimated area under flowers in India was about 88.3 thousand hectares during 1999-2000 out of which about 73 per cent is acquired by the traditional flowers. During the same period in Haryana there was only 2250 hectares of land under floriculture, having a production of 40500 tonnes.

Now a days, flowers cultivation has become popular in Haryana due to fast changing social scenario. The area under commercial flower cultivation has gone up from 0.6 thousand hectares in 1990-91 to 2.5 thousand hectares in 1998-99. The earning per hectare ranged between Rs. 50 thousand to 2.5 lakhs depending upon the nature, quality and yield of flowers. Gladiolus, rose, tuberose, marigold and chrysanthemum are the main flowers being taken up for commercial purposes. Keeping the above facts in mind the present study was undertaken to estimate the marketing cost and price spread for marigold flowers in Haryana.

Methodology

The study was undertaken in three districts of Haryana, viz. Gurgaon, Sonapat and Faridabad as these districts are the major flower growing regions of the state, and they also falls under the National Capital Region of Delhi state, because of ready market for flowers in the capital. The study is based on the primary data collected from 35 marigold flower growers of these selected districts for the year 2001-02. Besides this seven commission agents and ten retailers were also selected randomly. Three marketing channels found in the study area

were studied for estimating the marketing costs, margins and price spread of marigold flowers.

RESULTS AND DISCUSSION

Price Spread for Marigold

For estimating the price spread for marigold sold in the form of garlands, two marketing channels were identified in the study area i.e. Channel I : Producer—Commission agent—Retailer—consumer and Channel II : Producer—Retailer—Consumer.

It was observed that at retailer level the flowers were sold to the consumers in different forms such as flower basket, garlands, bouquet, cut flowers and in other forms as demanded by the buyers. However, for the present study only two most prevalent forms of marigold and rose use were taken into considerations for analyzing the marketing costs and margins. One is when flowers are sold after making garlands and other is when flowers are sold in the form of loose flowers. The marketing cost and margin also depend upon the form in which the product reaches to the ultimate consumers. Hence, the marketing costs and margins were worked out for each channel.

Table 1 showed that the net price received by the marigold producers when sold as garlands was Rs. 492 and Rs. 525 per quintal of flowers which worked out to be 23.08 and 24.63 per cent of the consumer's price in case of Channel I and II, respectively. The expenses incurred by the producers were same under both the channels, i.e. Rs. 28.90 per quintal accounting for 1.35% of the consumer's price. Producers had brought the flowers generally packed in gunny bags and cloths weighing about 20 kg weight. Prices were quoted per kg. of flowers. For bringing the produce to the assembling market, i.e. Kharibaoli, Delhi, the cheaper transportation facilities were found.

The farmers of the study area (villages) through which fast trains passes, generally bring the produce to the market by these trains. The farmers who bring their produce to the market through these trains, generally have the monthly railway passes. The farmers who do not bring the produce trains and the villages through which these trains do not pass use the services of cantor, tampos, four-wheelers, etc. It was found that packing charges and transportation cost were the two main items of total cost incurred by the producers. Marketing cost incurred by the retailers was Rs. 394.75 per quintal in case of purchase through commission agent i.e. channel-I and

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Rs. 349.00 per quintal in case of purchase directly from the producers, i.e. channel-II which accounted about 18.52% and 16.35% of consumer's price, respectively. The lower marketing cost in the case of channel-II as compared to channel-I was because of the fact that flowers were directly purchased from the producers and in this way intermediary's

cost/margin were reduced. Commission of commission agent (Rs. 30.50) and other marketing charges i.e. market fee, auction charges, etc. (Rs. 18.25) were shared by both the producers and retailers in Channel-II through mutual negotiation. Other components of cost incurred by the retailer remained almost the same under both the channels.

Table-1

Price spread for Marigold sold in the form of Garlands in Delhi market at Retailer's level through different channels (2001-2002)

Particulars	Channel-I		Channel-II	
	Cost/Price (Rs./q)	% age of consumer's price	Cost/Price (Rs./q)	% age of consumer's price
Net Price received by the producer	492.00	23.08	525.00	24.63
Expenses incurred by the producer				
(a) Packing charges	6.15	0.29	6.15	0.29
(b) Transportation charges	19.25	0.90	19.25	0.90
(c) Loading & unloading charges	3.50	0.16	3.50	0.16
Sub—Total	28.90	1.35	28.90	1.35
Producer's sale price/ Retailer's purchase price	520.90	24.44	553.90	26.99
Expenses incurred by the retailer				
(a) Commission of commission agent	30.50	1.43	—	—
(b) Other marketing charges (market fee, auction charges, etc.)	18.25	0.86	—	—
(c) Packing cost	5.50	0.25	5.50	0.25
(d) Transportation charges	6.00	0.29	6.00	0.27
(e) Processing cost	285.00	13.58	285.00	13.58
(f) Miscellaneous (loss in transit, spoilage, etc.)	49.50	2.32	52.50	2.45
Sub—Total	394.75	18.52	349.00	16.35
Retailer's margin	1215.35	57.03	1228.10	57.75
Retailer's sale price/ Consumer's purchase price	2131.00	100.00	2131.00	100.00
Marketing efficiency (per cent)		130.01		133.52

As the flowers were sold after making garlands of different sizes, the processing cost was the main item of cost incurred by retailers which was estimated at Rs. 285 per quintal in both the channels (13.38% of the consumer's price). The total cost incurred in the marketing of marigold in the form of garlands was estimated at Rs. 394.75 and Rs. 349.00 accounting for 18.52 per cent and 16.35 per cent of consumer's price in the case of channels-I and II, respectively. Retailers retained Rs. 1215.35 as margin for

trading one quintal of flowers through channel-I which worked out to be 57.03 per cent of consumer's price. In case of channel-II, retailers margin was Rs. 1228.10 per quintal accounting for 57.75 per cent of consumer's price. Although the consumer's price was same in both the channels i.e. 2131 per quintal, yet channel-II was found more efficient having marketing efficiency 133.52 per cent in comparison to channel-I with marketing efficiency of 130.01 per cent.

Table-2
Price spread for marigold loose flower in Delhi Market through different channels (2001-2002)

Sl. No.	Particulars	Channel-I		Channel-II		Channel-III	
		Cost/Price (Rs./q)	% age of consumer's price	Cost/Price (Rs./q)	% age of consumer's price	Cost/Price (Rs./q)	% age of consumer's price
1.	Net Price received by the producer	492.00	71.80	525.00	76.60	542	94.68
2.	Expenses incurred by the producer						
	(a) Packing charges	6.15	0.89	6.15	0.89	6.00	1.04
	(b) Transportation charges	19.25	2.80	19.25	2.80	20.25	3.56
	(c) Loading & unloading charges	3.50	0.51	3.50	0.51	4.25	0.72
	Sub-Total	28.90	4.20	28.90	4.20	30.50	5.32
3.	Producer's sale price/ Retailer's purchase price	520.90	76.00	553.90	80.80	—	—
4.	Expenses incurred by the retailer						
	(a) Commission of commission agent	30.50	4.44	—	—	—	—
	(b) Other marketing charges (mkt. fee, auction charges, etc.)	18.25	2.67	—	—	—	—
	(c) Packing charges	5.50	0.80	5.50	0.80	—	—
	(d) Transportation charges	6.00	0.88	6.00	0.85	—	—
	(e) Miscellaneous (loss in transit, spoilage, etc.)	14.00	2.04	15.50	2.25	—	—
	Sub-Total	74.25	10.83	26.00	3.90	—	—
5.	Retailer's margin	90.25	13.17	106.50	15.30	—	—
6.	Retailer's sale price/Consumer's purchase price	685.40	100	685.40	100	572.50	100
	Marketing efficiency (per cent)	354.39		424.65		1549.14	

Table -2 showed that the net price received for loose flowers by the producer in absolute term was found to be Rs. 548, Rs. 492 and Rs. 525 per quintal sold through Channel-I, II and III, respectively. But as far as producer's share in consumer's rupee is concerned, it was 71.80 per cent, 76.60 per cent and 94.68 per cent in Channel-I, II and III, respectively. The marketing cost incurred by the retailer in case of Channel-I was Rs. 74.25 per quintal accounting for 10.83 per cent of consumer's price and in the case of Channel-II, it was Rs. 26.00 accounting for 3.90 per cent of consumer's price. The main items of marketing cost incurred by the retailers in the case of channel-I were commission of commission agent (4.44 per cent of consumer's price) and other charges i.e. market fee, auction charges, etc. (2.67% of the consumer's price) which were not prevailing under channel-II. This made the difference in the marketing cost incurred by the retailers under both channels. This difference

was shared by the producer and retailer when retailers in the market purchased directly from the producer without involving commission agents i.e. where producers sold their produce through channel-II. Picking, transportation costs and spoilage loss were the main items of cost incurred by retailer. Retailers acted only as distribution agents as they after purchasing from the market sold to the consumers in the same form. Retailer margin was Rs. 90.25 per quintal accounting for 13.17% of the consumer's price in the case of channel-I. The retailer margin increased to Rs. 106.50 per quintal in channel-II, which was worked out to be 15.36% of consumer's price.

Conclusions

It can be safely concluded from the analysis of this study that marigold flower cultivation was highly profitable. Also under the present production structure marigold was the most profitable flower as compared to the other flowers. The policy

implications which emerge out include (i) cultivation of marigold being capital intensive require large investment. Therefore, there is a need of liberal credit facilities (ii) for popularizing marigold flower. There is strongly felt need to evolve new production technology and efficient marketing system and (iii) demand to flowers being unstable, facilities for storage and processing industries need to be created in these districts.

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'AGMARK' IS THE SYMBOL, QUALITY IS THE REALITY

Contract Farming in India—Progress and potential

—B. K. PATY*

1. Introduction

The new market realities due to focus on liberalization, privatization and globalization of the post—WTO regime are here to stay, bringing in its wake new opportunities and challenges as well. The agriculture sector, like any other sector of the economy, has got to put its act together to evolve a response mechanism to face this ineluctable reality. This may call for a paradigm shift in its focus and approach. Introduction of reforms in agricultural marketing is the need of the hour to bring the requisite changes in its structure and to push the sector to take off from its low growth rate of 2-3% to at least a respectable 4-5%. In this context some reforms measures have already been initiated, while some others are in the offing. However, the blitzkrieg of reforms for growth should in no way be allowed to push the interests of the millions of small and marginal farmers to the background. Against this backdrop, **contract farming** is billed to be a veritable instrument to address many of the traditional ills affecting the agriculture sector and the farmers, such as fragmentation of holdings, long chain of market intermediaries, ignorance about the requirements of the buyers, low farm mechanization, inadequacy of capital and distress sale and consequent heavy losses to farmers etc. Contract farming is an exciting way of giving the power of scale to the small farmers, of marrying the small farmer efficiency to the scale economy, transferring corporate management skill to the agriculture field, providing assured markets for the produce, reducing the transaction costs involved in the value chains of the commodities and of ensuring vertical integration through forward and backward linkages.

2. Contract farming system

2.1 Definition:—Contract farming arrangements of different types have existed in various parts of the country for centuries for both subsistence and commercial crops. The commercial crops like sugarcane, cotton, tea, coffee etc. have always involved some forms of contract farming or the other. Even in the case of some fruit crops and fisheries, contract farming arrangements, involving mainly the forward trading of commodities have been observed. However, in the wake of economic liberalization, the concept of contract farming in which national or multinational companies enter into contracts for marketing of the horticultural produce and also provide technologies and capital to contract farmers has gained importance. **Contract farming is generally defined as farming under an agreement between farmers and a sponsor (processing and/or marketing firm) for the production and supply of agricultural products under forward agreements, frequently at predetermined prices.**

Within this broad framework, there are different variants of contracts depending on the intensity of contractual arrangements. The basis of such arrangements is a commitment on the part of the farmer to provide a specific commodity in quantities and at quality standards determined by the purchaser and a commitment on the part of the sponsor to support the farmer's production and to purchase the commodity. Thus, under contract farming, the farmers grow selected crops under a buy back agreement with an agency called sponsor engaged in trading or processing and the latter contributes directly to the management of the farm through input supply including planting materials as well as technical guidance through intermittent crop supervision and also markets for the produce. Thus farmer assumes the production related risks, and the price risk is transferred to the company. In some cases, the company also bears the production risk, depending on the stage of crop growth at which the contract is made. If the contract is made at flowering or fruiting stage, the company bears the production risks also. It is this variant of contract farming which is said to be one of the ways by which small farmers can participate in the production of high value crops like fruits, vegetables, flowers etc. and benefit from market-led growth.

2.2 Variations of contracts :—The intensity of the contractual arrangement varies according to the depth and complexity of the provisions in each of the following three areas :

- **Market provision :** The grower and the buyer agree to terms and conditions for the future sale and purchase of a crop or livestock product. These conditions often specify price, quality, quantity and timing etc.;
- **Resource provision :** In conjunction with the marketing arrangements, the buyer agrees to supply selected inputs, extension or credit including on occasions land preparation and technical advice covering production practices, quality and standardization of the crop etc. These conditions directly shape and regulate the production and labour processes of the the grower;
- **Management specifications :** The grower agrees to follow recommended production methods, inputs regime, and cultivation and harvesting specifications.

2.3 Crops suitable for contract farming

In general contracting is practiced by companies in case of crops which are :

- **Perishable :** cannot be stored for long periods and needs to find market immediately.

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- *Bulky* : and therefore costlier to transport.
- *Plantation crops* : growers cannot abandon the plantations or the estates and are locked into relationship with processor.
- *Processible* : need for processing-based interdependence between growers and processors which can be exploited.
- *Variations in quality* : where crops vary in quality and quality is important for processing.
- *Unfamiliar* : medicinal plants like safed musli, ashwagandha etc. and new products for new markets like gherkins etc.

2.4 Models of contract farming :—There are five models of contract farming namely, the centralized model, the nucleus estate model, the multipartite model, the informal model, and the intermediary model that are in vogue in the country. A sponsor decides to follow a model depending on the market demand, production and processing requirements and economic and social viability of the farmers :

- In a **centralized model** a sponsor (a processor/packer) buys from a large number of small farmers. It is vertically coordinated with quota allocation and tight quality control. It is used for tree crops, annual crops, poultry, dairy etc. and products often requiring high degree of processing, such as tea or vegetables for canning or freezing. The model is also useful for products where market requirements necessitate frequent changes in the farm technology with fairly intensive farm-level support from the sponsor. Sponsor's involvement in production varies from minimal input provision to the opposite extreme where the sponsor takes control of most of the production aspects.
- **Nucleus estate model** is a variation of the centralized model where the sponsor also manages a central estate or plantation. The central estate is usually used to guarantee throughput for the processing plant but is sometimes used only for research or breeding purposes. The sponsor provides significant amount of material and management inputs under the model. The model is appropriate for crops such as tea, sugar and oil palm with which farmers may have had little or no experience. Such crops require significant long-term investment and generally immediate processing after the harvest.
- **The multipartite model** may involve a variety of organizations, frequently including statutory bodies. This model can develop from the centralized or nucleus estate model, e.g. through the organization of farmers into cooperatives, or the involvement of a financial institution.
- **The informal model** is characterized by individual entrepreneurs or small companies. It involves informal production contracts, usually on a seasonal

basis. It often requires government support services such as research and extension.

- **The intermediary model** involves sponsor in subcontracting linkages of farmers with intermediaries. There is risk of the sponsor losing control of production and quality as well as prices received by farmers.

All the above models are very much adopted by different sponsors for different commodities. The National Institute of Agricultural Marketing (NIAM), in its recent study (2004) on contract farming covering Karnataka, Madhya Pradesh, Punjab and Tamil Nadu, has identified four types of contract farming model in these states **in terms of the different entities involved** in a contract. The various types of contracts are :

- **Type-I**—involving none other than the contracted farmers and the sponsoring firms mainly providing the planting materials to the farmers. The extension wing of the procuring wing of the company takes care of the registration and other issues of pre-production and production. As there is no credit facility given by the sponsor, there is the risk of the farmers running into the hands money-lenders. Some of the Companies following this model are Nijjer Agro (Tomato and Chilly in Punjab), Tinna Oils (Soyabean in Maharashtra), SNC Oil (for Dhavana in Karnataka), Himalayan Drugs Private Ltd. (Ashwagandha, Karnataka), Pepsico (Basmati, Punjab) etc.;
- **Type-II**—This is a three tier model involving the sponsor, the farmers and an implementing agency which could be a public or a private body or a local NGO. The implementing agency conducts contract farming with the set of quality specifications and guidelines set by the corporate which is the ultimate buyer. The implementing agency conveys the contracted price as agreed by the purchaser of the commodity under contract to the farmers. The implementing agency may charge some minor share of the value of the produce from the buyer and from the farmers as an extension charge. "Ion Exchange Enviro Farms" is following this model in Maharashtra for contract farming of organic produce.
- **Type-III**—The model is similar to type-II as it has three tiers and the middle tier is replaced by a traditional channel member like artiya. These channel members help the corporates in indentifying the farmers, arranging for the cleaning and grading of the produce and also procuring the produce. At the same time the company is in direct contact with the farmers for provision of extension services. The model provides transparency but provides ample scope for the athiyas to cut corners for their benefits. The companies that adopt this model are United Breweries Limited (Barley, Punjab), ITC-IBD (Soyabean, wheat, Madhya Pradesh) etc.

- **Type-IV**—This model is the most elaborate model, under which all the services are provided under a single umbrella. The implementing agency in this model, which could be an independent corporate or an arm of the buying company, coordinates with all the agencies such as seed companies, input providers, banks and insurance providers for providing a plethora of services under the same roof. The implementing agency renders its services for a nominal fee from the farmers for extension services and a meager share of 0.5% to 1% share on the interest received by the bank and the value of the produce purchased by the buyer. The companies adopting this model are Mahindra Subhlabh Services Ltd. (Basmati, Non-basmati, Maize, Punjab, Tamil Nadu), Escorts Machinery Group (Basmati, Punjab), Super Spinning Mills (Cotton, Tamil Nadu), Cargill India Pvt Ltd (Soyabean, Wheat, Maize, Madhya Pradesh and U.P.), Appachi Cotton India (Cotton, Tamil Nadu), Gherkin exporters (Gherkin, Karnataka, Tamil Nadu, Andhra Pradesh).

2.5 Merits of contract farming :—In India contract farming has considerable potential where small marginal farmers can no longer be competitive without access to modern technologies and support. These small and marginal farmers, constituting 80% of the farmer population of the country, are generally capital starved and cannot make major investment in land improvement and modern inputs. Contract farming can fill up this gap by providing the farmers with quality inputs, technical guidance, management skills, credit as well as knowledge of new technology. Pricing arrangement can significantly reduce the risk and uncertainty of market place. Although the company deals only with the contract crop, the farmers' overall management skill may improve, thereby helping him to raise the yields of both contract and non-contract crops. From the standpoint of corporate bodies, farming reduces the supply risk, while the farmers enter into contractual arrangements with companies in order to minimize market and price risks.

Contract farming also contributes to value addition by facilitating the emergence of agro-processing industry which otherwise would not exist if supplies were not forthcoming in an organized manner. Furthermore, it enables export of the produce from small farmers who otherwise would not be able to access the demanding markets. Contract farming encourages higher quality production and better handling and sorting, thereby increasing the value of the produce emanating from the small farmers.

2.6 Risk factors in contract farming

- **Risks for farmers :**—Particularly when growing new and unfamiliar crops, farmers face the risks of both market failure and production problems.
- Inefficient management or marketing problems can mean that quotas are manipulated so that all contracted production is not purchased.

- Inefficient management can lead to overproduction, and in some cases sponsors may be tempted to manipulate quality standards in order to reduce purchases.
- Sponsoring companies may be unreliable or exploit a monopoly position.
- The staff of sponsoring organizations may be corrupt, particularly in the allocation of quotas.
- Farmers may become indebted because of production problems, poor technical advice, significant changes in market conditions or company's failure to honour contracts or excessive advances.

Risk for sponsors

- Contracted farmers may face land constraints due to lack of security of tenure, thus jeopardizing sustainable long-term operations.
- Social and cultural constraints may affect farmers' ability to produce to managers' specifications.
- Poor management and lack of consultation with farmers may lead to farmer discontent.
- Farmers may break the contract and sell the produce in alternative markets, sometimes encouraged by rival sponsors or ruling higher prices in open market.
- Farmers may divert inputs supplied on credit to other purposes, thereby reducing yields.

2.7 Perception of the farmers about contract farming :—The above cited NIAM study reveals that farmers have positive perception about contract farming. The reasons identified by the farmers are (a) assured market for the produce, (b) assured in time cash payment by the buyers, (c) technology dissemination, (d) supply of quality inputs, (e) yield increase, (f) quality production, (g) hedging of risk against price fluctuation, (h) improved post harvest practices and (i) exemption of market fees, etc. in some states for direct marketing.

2.8 Constraints to contract farming :—The present APMC Acts restrict the processors/manufacturers etc. from entering into direct contract with farmers as the produce is required to be canalized through a regulated market only. In order to facilitate contract farming, it is necessary to incorporate a provision in the APMC Act to specifically allow contract farming programmes by processing or marketing firms, the produce covered by the agreement should be allowed to move freely from the farmer's field to any destination in the country or abroad without the necessity of going through the licensed traders or regulated markets.

2.9 Measures needed to support contract farming :—In view of several observed and perceived benefits of contract farming, such arrangements need to be encouraged widely, for different commodities in different regions, in a manner to equitably protect the interests of farmers as well as the industry. The limited commodity specific experience of contract farming in the country shows that the spread and success of contract farming would require the following conditions to be met:—

- (a) The contract farming should be made legal. In case of violation of contract, from either side, farmers as

well as the company should be in a position to approach an organization or institution, which can mediate and settle the dispute.

- (b) There should be an institutional arrangement for registration of sponsoring companies and recording of contract farming agreements, may be with the local market committee or panchayat or some Government machinery. This is considered necessary for maintaining the records and checking the unscrupulous and fly-by-night companies from duping the farmers. This will promote and strengthen confidence building between the parties and also help solve any dispute, arising out of violation of contract.
- (c) A typical contract farming agreement is an agreement between two unequal parties involving large number of illiterate farmers on one side and a mighty sponsoring company on the other. These farmers do not have sufficient means to approach the court of law for resolution of disputes, if any, with the company. It is equally difficult for the company to redress the breach of agreement by the farmers through the present mechanism of civil court. Hence it is necessary to create a dispute resolution mechanism near to the farmers, which can quickly settle the disputes in a quasi-judicial manner.
- (d) The farmers may be required to invest substantial amount of resources to raise the contracted crops and run the risk of incurring huge debt in the event of crop failure, which may result in their displacement from the land, affecting their livelihood. In order to protect the farmers from such displacement, it is considered necessary to prevent by law displacement of farmers from their land as a consequence of the contract farming agreement.
- (e) The contracts should be managed in a more transparent and participatory manner so that there is greater social consensus in handling contract violation from either side without getting involved in costly as well as lengthy process of litigation. Also the contract needs to be drawn in a more comprehensive and flexible manner.
- (f) The most important thing for the sustainability of contract farming is the selection of appropriate plant genotype. Unless the plant material is of good quality and high yielding and less prone to pests and diseases, the contract farmers may lose confidence and discontinue the cultivation of contract crop in question.
- (g) The proposed contract crop should have a distinct advantage in terms of relative yield and profit, which will provide higher income to the contract farmers on stable basis.
- (h) In many parts of the country, agricultural tenancy is legally banned, although concealed tenancy exists. Tenants who do not enjoy security of tenure cannot

participate in contract farming. Hence, legalization of tenancy would be a precondition for enabling the tenant farmers to benefit from contract farming. Although different forms of land tenants including share-croppers can be adopted to maintain the contract farming, security of tenure would be necessary.

- (i) As assured market for the farm produce motivate a farmer to enter into contract with a company, a similar market prospect should exist for the processed products of the company. Ultimately, it is the success of the company's product in national and or international market, which decides whether contract farming for any particular crop or commodity would sustain.
- (j) It has to be ensured through an appropriate state agency that contract farming, which is generally commodity specific and tends to promote monoculture does not grow beyond proportion to destroy bio-diversity and agricultural ecology. It may be necessary to provide necessary guidelines for land use planning in each region in order to prevent such eventualities.

2.10 Actions taken by Central and State Governments

- The Department of Agriculture and Cooperation has evolved a 'Model Act' on Agricultural Marketing (APMC Act) which, inter alia, provides for registration of sponsoring companies, recording of contract farming agreements, indemnity to farmers' land and lays down a time bound dispute resolution mechanism. Model Specifications of Contract Farming Agreement have also been formulated in order to guide the stakeholders to evolve appropriate agreements as suited to them.
- The Model Agreement and supporting Model Act has been discussed with the State Governments and the representatives of trade and Industries at a National Conference of State Agriculture Ministers on 07.01.2004 and a consensus arrived at to give a major thrust to this programme.
- Several State Governments have accordingly initiated legal amendments to APMC Act. States where legal changes have already been made to support Contract Farming are Madhya Pradesh, Uttar Pradesh, Punjab, Tamil Nadu and Karnataka. States where amendment to APMC Act are under active consideration of the State Governments are Maharashtra, Kerala and Orissa. States where Governments have agreed to provide support to Contract Farming Agreement are Chhatisgarh, Bihar and Jharkhand.
- Punjab is among the first State to promote contract farming on a large scale in the country. During 2003-04, contract farming was done in an area of 2.50 lakh acres. The value of commodities contracted with the farmers is of the order Rs. 3.50 crores. Important commodities contracted were High Protein Wheat, Basmati Rice, Maize, Sunflower and Rapeseed,

Barley, Castor, Yellow and red Onion, exotic vegetables and organic sugar cane, Basmati and Wheat. Important corporate houses involved include Tatas, Mahindras, Escorts, Satnam, Pepsi, Hindustan Lever, Sunstar, United Brewery and Conagra.

A list of initiatives taken by corporate sector in promoting contract farming in various states is placed at Annexure-I.

2.11 Contract farming in different states of India

- Contract Farming is fast evolving as a mechanism of alternative marketing in the country. Punjab, Karnataka, Maharashtra, Madhya Pradesh, and Tamil Nadu have proved to be the front-ranking States in this respect (Annexure Table). The little experience of contract farming in India shows that there is considerable saving in consumption of water & fertilizer due to the introduction of improved technology and better extension service. Contract farming has usually allowed the farmers some form of credit to finance production inputs. In most cases it is the sponsors who have advanced credit through their managers. In some cases, viz. Appache model of contract farming for cotton in Tamil Nadu, there are arrangements for loans from commercial banks. Contract farming has been successful in effecting crop diversification in many states.
- The different commodities covered under contract farming are both traditional ones like Basmati Rice, Wheat, Maize, Red Gram, Bengal Gram, Groundnut, Sesame, Cashewnut, Cotton, etc. and non-traditional ones like Medicinal Plants (Ashwagandha, Dhavana, Coleus, Safed, Musli, etc.) and Gherkins, etc.
- The different services provided by the sponsoring firms range from supply of inputs like fertilizers, seeds, pesticides to extension services and quality monitoring, etc.
- The NIAM study points out that none of the existing ventures have been able to adopt any procedure that legally binds their contractual agreements. They have been working on the basis of 'mutual trust'. However, with increase in the acreage, the participation of farmers and corporates and investment from almost all segments related to farm production and marketing, the management of the system appears to be posing several problems and challenges. Hence a major recommendation of the study is for farming of a formal legal framework that will give enforceability to the contract farming agreements.

Some other Studies

A study of 400 farmers engaged in contract farming for growing tomatoes under agreement with Hindustan Lever Ltd. in Northern India reveals that yields of the farmers under contract were 64 per cent higher than those outside the project. In yet another study of the contract farming arrangement of the fast food chain McDonald with the farmers

in Gujarat for processible varieties of potatoes, it is found that because of the extension services provided by the sponsor, the farmers use sprinklers and drip irrigation systems that save 40 per cent of water, 20% of fertilizer and also increase the yield by 12%. An empirical study conducted (Rangi and Sidhu) and contract farming in Punjab during 1998-99 reveals that the per acre comparison of gross returns clearly indicate that tomato crop had edge over other three crops mainly due to assured price through contract farming. The gross return of tomato crop was to the extent of about Rs. 28000/- (33%) per acre in comparison to Rs. 9500/- (25%) for wheat, Rs. 11000/- (38%) for paddy and Rs. 8100/- (about 4%) for potato. These figures speak for themselves that contract farming may be encouraged for other perishable commodities. Such enterprises may be encouraged by the State Governments mainly in the private sector.

An impact assessment study of contract farming in Punjab conducted in the year 2003 shows that 5000 growers joined contract cultivation of Barley, Sunflower, Hyola and certain vegetables and have appreciably been benefited in terms of increased returns. The response of the industry was also encouraging, with 20 companies signing contracts for procurement of different crops and another 5 Agricultural Extension Service Providers signing contracts on behalf of buyer companies. The State Government has decided to extend the area under contract farming to 25 lakh hectares by the end of 2007.

A table of contract farming showing the position in different states is placed at the ANNEXURE-I. A diagrammatic presentation of a typical contract-farming framework containing the duties of different stakeholders is also placed in the ANNEXURE-II.

2.12 Future of contract farming in India post WTO agreement

The future of contract farming in India is quite promising, thanks to the increasing consciousness about food safety among the rising middle class population with rising disposable income and the food safety requirements of the export market of the developed countries. As the economy grows, there will be an increase in the number of people with high disposable income and consciousness about quality and health who will demand food products of certain specifications. Further, developed countries prescribe exacting standards of quality for imports of agricultural commodities and processed food from developing countries. The WTO agreements on Sanitary and Phytosanitary (SPS) measures are in accordance with food safety and food standards set by the Codex Alimentarius Commission (CAC). An important component of the CAC guidelines is the implementation of a food safety system called Hazard Analysis and Critical Control Points (HACCP). This needs to be incorporated in the food quality system of the food processing units, otherwise the SPS agreement can act as a non-tariff barrier for exports. Contract farming enables firms to have control over production of agricultural commodities at various stages of growth, thus making it possible to meet such standards of food safety.

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हमेशा “एगमार्क प्रमाणित वस्तुएं ही खरीदें।

Labour Utilization and Input Use Pattern in Banana Cultivation

—MORE S. S.¹, SHELKE R. D.² & KALYANKAR S. P.³

Introduction

The production of fruit and vegetables to cultivators is of vital importance as it provides three to four times more cash income than cereals per hectare of land (Bose, 1985). The fruit crops hold a great promise for accelerating income of the cultivator. Realizing the importance of fruit cultivation many growers are diverting their resources towards plantation of fruit crops. Area under fruit crop is therefore, increasing day by day especially in the vicinities of cities as it offers a ready market for disposal of highly perishable produce.

Banana is one of the oldest fruit of the world. It is an important nutritional diet for people, especially in the tropical areas. The five important banana-producing states in the country are Maharashtra, Tamil Nadu, Gujarat, Karnataka and Andhra Pradesh. These five states contributed more than 70 per cent of total banana production in the country. The total area and production of banana in India was 3.96 lakh hectare and 9.925 million tonnes, respectively. It comprises 12.36 per cent of the area under fruit and is the second most important fruit crop. (Bose, T.K., 1985, *Fruits of India, Tropical and sub-tropical*. Maya Prakash publication Calcutta. pp. 10).

Keeping in view the economic importance of banana in the fruit crop plan, an attempt has been made in the present study to work out labour utilization and input use pattern in banana cultivation in Marathwada region of Maharashtra State.

Materials and Methods

The present study was conducted in the Nanded and Parbhani districts of the Maharashtra State. The study is based on an intensive enquiry of 120 banana growers, selected randomly from 6 villages each from Nanded and Parbhani districts. The data were collected by survey method through personal interview with the respondents during 1998-99. Tabular analysis was used to analyze the labour utilization and input use pattern in banana cultivation.

RESULTS AND DISCUSSION

Labour Utilization Pattern

The operation-wise labour utilization pattern in banana cultivation is presented in Table 1. The table reveals that, the total labour utilized per hectare of small farmers category was higher than large and pooled farmers categories. Totally 281 man-days of human labour, 50.79 bullock pair days and 18.29 machine hours were used by small category farmers.

Among the various operations, irrigation utilized the highest proportion of human labour in all the categories of farmers, since banana is a water intensive crop and requires irrigation throughout the year. There was no significant difference between utilization of human labour for irrigation among different categories of farmers, due to the fact that there was not much difference between irrigation interval among different categories of farmers.

Application of manure and fertilizers was the next major operation in the production of banana, which consumed substantial share of total human labour. Compared to small farmers and pooled farmers, large farmers used less human labour for application of manures and fertilizers. It was due to the operation of economics of scale in large farms. Same trend was observed in the case of other operation like cleaning of field, weeding, earthing up and cutting/harvesting.

The proportion of bullock pair ploughing was less in all categories of farmers, because of maximum banana growing farmers are not using bullock pair for ploughing operation. In study area there was a general trend to use machine labour for ploughing and clod crushing operation. However, total bullock pair used was more in small farmers category (50.79 pair days) than in large (42.20 pair days) and pooled (42.90 pair days) farmers categories. As small orchards carried out intensive cultivation practices, they required more number of bullock pair and same trend was also found with respect to machine hour also. The high machine hour utilization pattern was found in the case of small farmers category (18.27 hours) followed by pooled (16.23 hour) & large (15.14 hours) categories of farmers. Among the various farmers categories maximum share of machine hour was taken by ploughing (10.44, 8.50 and 9.29 hour in small, large and pooled farmers categories, respectively) followed by clod crushing. Similar findings were noticed by subramanyan S. R. in his study on resource use relationship.

Physical requirement of inputs for Banana Cultivation

Per hectare physical requirement of inputs for banana cultivation in different size groups of farmers in the study area is presented in Table 2. The input wise requirement has been discussed as under.

Manures and Fertilizers

On an average utilization of manures/ha were found to be highest in case of small followed by pooled and large farmers

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category which is 23.06, 21.95, 21.54 cartload respectively. Average use of nitrogen, Phosphorus and potash fertilizers was 305.53, 171.92 and 90.78 kg per hectare, in small farmers category, 259.05, 167.76 and 93.43 kg per hectare in large farmers category and 271.61, 168.84 and 94.44 kg per hectare in pooled farmers categories, respectively. The maximum use of fertilizers was found in the case of small farmers category and the minimum was in large farmers category. As small farmers carried out intensive cultivation they required more manures and fertilizers compared to large and pooled farmers categories.

Irrigation

Number of irrigation given to the banana crop ranged among the various groups between 56 to 61. Small farmers had given more number of irrigation (60.69) than the large (56.44) and pooled (58.44) farmers categories.

Conclusion

The study revealed that major proportion of human labour was used for irrigation of banana crop, hence there is need to encourage the farmers to adopt drip irrigation method which is somewhat costly, but labour saving method of irrigation.

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Table-1
Labour Utilization Pattern in Banana Cultivation

			(per ha)		
Sl. No.	Operation	Units	Small Farmers	Large Farmers	Pooled Farmers
1.	Ploughing	Machine labour hour	10.44 (57.14)	8.50 (56.14)	9.29 (57.24)
2.	Clod crushing	Machine labour hour	7.83 (42.86)	6.64 (43.86)	6.94 (42.76)
A	Sub-total		18.27 (100.00)	15.14 (100.00)	16.23 (100.00)
3.	Ploughing	Bullock labour pair days	8.30 (16.34)	6.93 (16.42)	7.04 (16.41)
4.	Harrowing	Bullock labour pair days	9.27 (18.25)	7.52 (17.82)	7.70 (17.95)
5.	Hoeing	Bullock labour pair days	33.22 (65.41)	27.75 (65.76)	28.16 (65.64)
B.	Sub-total		50.79 (100.00)	42.20 (100.00)	42.90 (100.00)
6.	Cleaning the field	Man-days	9.02 (3.21)	6.25 (2.42)	7.00 (2.63)
7.	Digging pits and planting of suckers	Man-days	42.84 (15.25)	43.42 (16.78)	43.95 (16.49)
8.	Application of manure and fertilizers	Man-days	55.06 (19.59)	45.27 (17.50)	47.95 (17.99)
9.	Weeding	Man-days	29.86 (10.63)	20.51 (7.93)	23.66 (8.88)
10.	Earthing up	Man-days	5.90 (2.10)	5.75 (2.22)	5.80 (2.18)
11.	Irrigation	Man-days	128.96 (45.89)	128.24 (49.58)	128.84 (48.43)
12.	Cutting/harvesting	Man-days	9.36 (3.33)	9.23 (3.57)	9.29 (3.49)
C	Sub-total		281 (100.00)	258.67 (100.00)	266.49 (100.00)

Note :—figures in the parentheses indicate percentage to sub-total

Table-2
Input use Pattern in Banana Cultivation

(per ha)

Sl. No.	Particulars	Units	Small Farmers	Large Farmers	Pooled Farmers
1.	Farm yard manure	Cartload	23.06	21.54	21.95
2.	Fertilizer	Kg			
	Nitrogen		305.53	259.05	271.61
	Phosphorus		171.92	167.76	168.84
	Potash		90.78	94.43	93.44
3.	Irrigation	No.	60.69	56.44	58.44

“एगमार्क भारत सरकार द्वारा गुणवत्ता के प्रमाणन की एक प्रणाली है।

Performance of Cashew Exports from India

—S.S. WADKAR¹, J.M. TALATHI² and S.R. TORANE³.

Introduction

India's export of cashew kernels had increased from 16.9 thousand tonnes in 1847 to 50.90 thousand tonnes in 1991-92. Further the export of cashew recorded for the year 2000 was 92.5 thousand tonnes. The international scenario of cashew kernel trade keeps India still next to none, but closely followed by Brazil with 30 per cent share captured.

India is the largest, producer, processor and exporter of cashew in the world. It's share in the world production ranged between 39 to 62 per cent during 1991 to 1995. The Indian cashew kernel is acclaimed for its better quality, appearance and taste. World trade in cashew was increasing since 1950, but in late seventies, declining trend was observed. Subsequently, during eighties, it had been on the increasing trend. This fluctuation might be due to emergence of competition in the international market.

At present, the problem of inadequate domestic production has been in existence for many years. Therefore, India imports raw cashewnuts from the countries like Tanzania, Indonesia, Benin, Mozambique etc.

In the context of growing domestic and international demand for cashew an attempt has been made in this investigation to review the export performance of cashew.

Methodology

The export performance of cashew was studied by collecting time series data from 1980-81 onwards on cashew export, production, world price, domestic price and domestic consumption from published reports of Cashew Export

Promotion Council, Directorate of Cashew Development, Cochin etc. by making two groups viz, pre liberalized, liberalization period 1980-90 and post liberalization period 1990-2000.

The growth rate analysis was carried out. The factors affecting the export performance of cashew were also analysed by considering export of cashew as dependent variable through following equation.

$$\text{Export} = b_0 + b_1 \text{CPROD} + b_2 \text{EXPRICE} + b_3 \text{DPRICE} + b_4 \text{DCONS} + b_5 \text{WPROD} + U_t$$

Where;

X EXPORT = Export of cashew (000T)

X₁ CPROD = Production of cashew (000T)

X₂ EXPRICE = Export price of cashew, Rs. per quintal

X₃ DPRICE = Domestic price of cashew, Rs. per quintal

X₄ DCONS = Domestic consumption of cashew (000T)

X₅ WPROD = World Production of cashew (000T)

U_t Error term

RESULTS AND DISCUSSION

Export scenario

World export of cashew kernels and India's share in the total world's export is presented in the Table 5.21. It is

Table-1

Average export earnings from cashew and share in total agricultural exports and country's total export

(Rs. in Crores)

Sl. No.	Particulars	1981-85	1986-90	1991-96	1995-96	1998-99	1999-2000
1.	Total export	8967.00	17382.20	56541.40	106353.00	14160.00	162738.00
2.	Agricultural export	2879.30	3161.82	9148.39	21138.00	26200.00	29082.00
3.	Cashew export	157.50	300.84	829.82	1237.00	1637.00	2451.00
4.	Percentage share of India's cashew export in						
	(a) Total export	1.75	1.73	1.46	1.16	1.17	1.51
	(b) Agricultural export	5.47	9.51	9.08	5.85	6.24	8.43

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observed that except in the year 1980 India occupied dominance in the international trade and transacted above 60 per cent share of the world export. In the year 1980, the share was 47.4 per cent in the year 1985 with the export of 40,553 India captured 61.4 per cent share of total world export. Recently in the year 1996, India captured 61.0 per cent share of world export by exporting 70,308 MT of cashew kernels.

The percentage share of cashew export in agricultural export and country's total export were calculated and given in Table 1. It is found that in the period 1981—85, the share

of cashew export was 1.75 per cent and 5.47 per cent in the country's total export and agricultural export was maximum i.e. 9.51 per cent in the period 1986-90. In the year 1995-96, the share of cashew in the country's total export was lower i.e. 1.16 per cent. However, in the year 1999-2000 the share was increased to 1.51 per cent and 8.43 per cent to the country's total export and agricultural export, respectively.

It was clear that cashew constituted about 6–9 per cent of the total export earnings from agricultural and allied products. In the total country's export on an average cashew constituted about 1.5 per cent share.

Table-2

Simple and compound growth rates of total cashew export for the period I i.e. 1980-81 to 1989-90, period II 1990-91 to 1999-2000 and overall (1980-81 to 1999-2000)

Sl. No.	Particulars	Simple Growth Rate			Compound Growth Rate (%)		
		I	II	Overall	I	II	Overall
i.	Cashew kernel quantity (MT)	1160.60*	4140.94**	3081.83**	3.18*	6.51**	6.08**
ii.	Value at current prices (Rs. lakh)	2509.00**	16153.71**	9544.72**	11.69**	15.97**	16.62**
iii.	Value constant prices (Rs. lakh)	201.95NS	2072.67**	1491.05**	1.32NS	7.28**	6.45**
iv.	CNSL Export quantity (MT)	456.20NS	-426.20*	-207.50**	-9.24*	-15.50*	-6.43**
v.	Value at current prices (Rs. lakh)	-17.22NS	-10.07NS	3.21NS	-3.05NS	-4.21NS	1.61NS
vi.	Value at constant prices (Rs. lakh)	-36.31NS	-12.36NS	-14.15**	-1180NS	-11.38NS	-7.54**

**Significant at 1% level

NS : Non-significant

*Significant at 5% level

Export of Cashew kernel

It can be seen from table 2, that the simple growth rate of total quantity of cashew kernel exported was maximum i.e. 4141 MT in period II which indicated that during the second period the per annum quantity exported increased, significantly by 4141 MT. However for the period I, simple growth rate of the quantity exported was 1161 MT and it was significant. At the overall level, the quantity of cashew kernels exported, increased significantly by 6.51 per cent during the period II. However, percentage increase was 3.18 per cent during period I and at the overall level the quantity exported significantly by 6.08 per cent. Current prices increased significantly by Rs. 16154 lakh. However, for the period I the value received at current prices, increased significantly by Rs. 2509 lakh per annum. At the overall level at current prices increase was Rs. 9545 lakh per annum. In terms of percentage the value received at current prices increased significantly by 15.97 per cent during the second period. However, percentage increase was 11.69 per cent for period I. At the overall level, the value received at current prices increased significantly by 16.62 per cent.

At constant prices, the simple growth rate was maximum for period II, i.e. Rs. 2072 lakh, which indicated that during

the second period the per annum value received at constant prices increased significantly by Rs. 2072 lakh. However, for the period I the value at constant prices increased significantly by Rs. 201.95 lakh. At the overall level, the value increased significantly by Rs. 1491 lakh. In terms of percentage, the value received at constant prices increased significantly by 7.28 per cent during period II. However, percentage increase was 1.32 per cent for period I. At the overall level increased significantly by 6.45 per cent in value terms.

Thus it can be concluded that in case of cashew India was virtually a monopoly supplier to the world. The area under cashew in India grew at the annual rate of 5.65 per cent during period under study. The production increased at an annual rate of 4.55 per cent. The positive growth rates in respect of production and export of the cashew were due to the increased domestic production and increased demand for cashew kernels in the international market. The increased domestic production and exports were due to the several measures taken by the Directorate of cashewnut development, Cashew Export Promotion Council, state agricultural Universities on improved methods of production, assistance for export of cashew kernels by setting up facilities

for upgrading quality and technical advice on scientific post-harvest operations and processing. Though India had a monopoly position in the international market, the countries like Brazil, Vietnam, Mozambique were emerging as competitors in the recent times. This would certainly erode a portion of our market share. Hence, we should make efforts to retain our monopoly position in future by updating our cultivation practices by using of high yielding varieties and maintaining quality prescriptions in international trade.

Export of Cashewnut Shell Liquid (CNSL)

The quantity of CNSL exported, decreased by 456.20 MT and 426.20 MT during the period I and II, respectively. But these figures were non-significant. At the overall level the quantity of CNSL exported, decreased significantly by 207.50 MT per annum. In percentage terms, the quantity decreased by 9.24 per cent and 15.50 per cent significantly for the periods I and II, respectively, while the figures were significant. At the overall level, the quantity of CNSL decreased significantly by 6.43 per cent.

At current prices, the value received, decreased by Rs. 17.22 lakh per annum during the period I. However, during the period II, the value decreased by Rs. 10.07 lakh per annum. With overall increase in value by Rs. 3.21 lakh, but all these figures were non-significant. In terms of percentage, the value for period I, was decreased by 3.05 per cent. During the period II the value decreased by 4.21 per cent. At the overall level the value received at current prices increased by 1.61 per cent. However these figures were statistically non-significant.

At constant prices, the simple growth rate of value received for the period II was Rs. 12.36 lakh i.e. indicated that the value decreased by Rs. 12.36 lakh per annum during the period II. So also, during the period I, it was decreased by Rs. 36.31 lakh per annum. At the overall level the value decreased by Rs. 14.15 lakh per annum. In terms of percentage, during the period II, the value at constant prices decreased by 11.38 per cent per annum and during the period I, it decreased by 11.80 per cent. At the overall level, the value decreased by 7.54 per cent. But all the values for simple and compound growth rates were non-significant except at overall level it was found to be significant.

It was also observed that, there was fall in the export of CNSL quantity. As there are mainly two process involved in cashew processing viz. oil bath process and drum roasting process. In the oil bath process, extraction of CNSL leads to scorching and breakage of nuts, thus reducing their market value. In the other process, the nuts were not damaged much and they command better market price. However, the entire quantity of shell liquid gets burnt. In the other process, the nuts were not damaged much and they command better market price. However, the entire quantity of shell liquid gets burnt. It was this factor, which weighs in the mind of processors in deciding about the extraction of CNSL. The

price of CNSL should be so high as to compensate for the loss in the low quality of kernels obtained in the oil bath process, then only the processors will go in for extraction of CNSL. Also our traditional market Korea Rep. had decreased its import of CNSL, these two factors might be responsible for fall in the export of CNSL quantity.

The multiple linear regression equation

To study the factors influencing the export performance of cashew, the multiple linear regression equation was employed. The factors affecting the export performance of cashew was studied by considering export of cashew kernels as dependent variable (y) and the factors viz., domestic production (x_1), export prices (x_2), domestic price (x_3), domestic consumption (x_4) and world export (x_5) as independent variables. The specified form the equation was

$$y = b_0 + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + U_t$$

Table-3
Estimates of regression equation

Variables	Regression coefficient	t – Value
Intercept	9.5248	—
X_1	0.005 NS	0.19
X_2	0.003 NS	0.10
X_3	0.002 NS	0.28
X_4	0.016 NS	0.28
Coefficient of Multiple X	0.615 **	4.95
Determination R ²	0.9658	

From the table 3 it can be observed that the regression coefficient for cashew production was 0.005 thousand tonnes and it was non significant. The regression coefficient for domestic price was 0.003 thousand tonnes, domestic consumption (0.016) thousand tones and found to be non significant. The regression coefficient for world export was 0.615 thousand tonnes and it was significant, which indicated that when the world export was increased by 1 thousand tones, the indian export significantly increased by 0.615 thousand tonnes. The coefficient of multiple determination (R^2) indicated that about 96 per cent of the variations in the export of cashew were explained by the variables specified in the equation.

Contribution of independent variables of Indian export of cashew kernel

Multiple regression equation was fitted as $Y = -2.48 - 0.098 + 0.00218 + 0.00121 + 0.00744 + 0.00387 - 0.0158 + 0.576^{**}$ world export was fitted. But it was found to be significant and remaining were highly non significant. This may be because of multicollinearity observed in various independent variables.

For above data step down regression as method was used. Export was found to be linear function of export price of world export and regression equation.

$Y = -6.714 - 0.000779 * \text{Export price} + 0.581 ** \text{ world export}$.

This indicated that Indian export contributed 58 per cent of world export but export price slightly affects Indian export.

Individual regressions were obtained and presented in the table 4.

Table-4
Individual regression

	Independent variables	Intercept	Regression co-efficient
1. Raw material production	X_1	-6.93	0.1902**
2. Export price	X_2	17.70	0.0029**
3. Domestic price	X_3	17.54	0.0193**
4. Domestic consumption	X_4	43.58	0.1149**
5. The world export	X_5	-13.75	0.7684**

The regression equation indicated that unit increase in Raw-material production, Export price, Domestic price, Domestic consumption increases Indian export by 19 thousand tonnes 0.0029 thousand tonnes, 0.0193 thousand tons, 0.7684 thousand tonnes.

Conclusion

The quantity of cashew kernels exported grew by 6.08 per cent. The positive growth rate in respect of export of cashew was due to the increased domestic production and increased demand for cashew kernels in the international market. The simple growth rates were 1160.60 MT and

4140.94 MT for the periods I and II, respectively. This indicated that, the quantity exported has increased more in period II than period I.

It is also concluded that liberalization policy since 1990's has positive effect on cashew export. As regard to the export of CNSL, the quantity exported decreased significantly by 207.50 MT or by 6.43 per cent. For maintaining the quality of cashew kernels in international market, drum roasting method was used, and this has resulted into less extraction of CNSL.

The coefficient of multiple determination (R^2) explained about 96 per cent of the variation in the export of cashew by the independent variables specified in the regression analysis. The independent variable included were domestic production export price, domestic price domestic consumption and world export. Further, through step down analysis, it was revealed that Indian exports of cashew contribute 58% of the world export, but export price slightly affects India's cashew exports.

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'AGMARK' ENSURES CONSUMERS PROTECTION

Food Security in the State of Haryana : An Economic Analysis

—GAJENDRA SINGH* AND T.S. BHOGAL**

1. Introduction

It goes without saying that food is a basic necessity for human existence. The right to food is as good as right to life. Hence, right to food qualifies to become a fundamental right across the nations. Given the importance of food for human life and the complexities of the issues related to it, food security has been a much discussed subject in different national and international forums. Way back in the year 1975, an important early step by FAO was the establishment of the Global Information and Warning System on Food and Agriculture for generating advance information about the possible food emergencies in different parts of the world, so that preventive measures could be taken for the vulnerable communities and areas.

The dynamics of food security can be best perceived, when it is analyzed in different dimensions and perspectives. The basic concept of food security formulated by Food and Agriculture Organization of the United Nations (FAO, 1983) implies that “all people at all times have both physical and economic access to the basic food they need”. The concept of food security undergoes a change with the stage of development reached by the society and in developing country like India, the food security may be visualized to make available minimum quantity of foodgrains to the entire population. Foodgrains are important in Indian context as our first problem is to reduce hunger, therefore trend in per capita supply of foodgrains is always considered as an indicator of improvements in the food security. It has been observed that due to lack of purchasing power among the lower income groups a section of the population in India is not able to consume the adequate amount of cereals. Besides, the protein gap in lower and middle-income groups is more pronounced due to the high prices of pulses.

A primary condition for food security is the stabilization of population and in our country the food security in the long run will depend partly on slowing population growth in the coming decades. The food deficit increases when growth rate of population surpasses the growth rate of food supply. Thus, examination of food population relationship is very important, as requirement of food is directly proportional to the population growth rate. The increased availability of food is a necessary condition for achieving food security in food deficit countries and increment in local production is a key to improve food security. Against the back drop of all these issues, the present paper is an attempt

to analyze and forecast about the food security situation in the State of Haryana.

The State of Haryana, located in the north-west part of the country, has got climatic conditions varying from arid to semi-arid. Nearly 86% of the geographical area is cultivable, out of which 96% is under plough. There are two agro-climatic zones in the State. The north-western part is suitable for Rice, Wheat, Vegetable and temperate fruits and the south-western part is suitable for high quality agricultural produce, tropical fruits, exotic vegetables, herbal and medicinal plants. Besides meeting its own requirement for foodgrains, the State also contributes significant amount of foodgrains to the Central Pool annually, thereby playing an important role in improving the food security status of the country. A substantial portion of Basmati rice exported from the country is produced and sourced from Haryana only.

2. Approach and objectives of the study

The study is confined to foodgrains only, as the same is considered as the important determinant of the food security in India. The study is based on the premises that the gap between food supply and food requirement is a better indicator of the food security level than the usually adopted supply demand gap. The concept of food requirement differs to the concept of food demand in the sense that food demand mainly depends on purchasing power of people and other multivariate factors like taste, price of substitute, consumer preferences etc. The food requirement is unaffected by all these factors and depends mainly on the energy (calorie) need of the individuals and is constant for a particular age group. Needless to say that the Indian population is predominantly vegetarian and in their diets, cereals dominate in food expenditure and considered as major source of calories. Also, a recognized role of pulses to supplement the quality proteins in vegetarian diet cannot be neglected.

The paper attempts to make short term projections of foodgrains supply and requirement up to the year 2011 for the State of Haryana. The study attempts to throw insight in to the different aspects of the future food security situation of the State which has a bearing on important policy decisions for foodgrains covering different aspects like infrastructure, storage, marketing etc.

With the background of the above cited approach the following are the specific objectives of the study :

1. To estimate the supply of foodgrains in the state for the years 2005-06 and 2010-11.

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2. To estimate the foodgrains requirement by the different age groups of population in the state for the year 2005-06 and 2010-11.
3. To project the food security scenario in the state for the year 2005-06 and 2010-11, and derive policy implications.

The net production estimated in analysis refers to the production available for human consumption and, as per widely accepted norm, was computed after deducting the 12.5 per cent allowance (for seed, feed and wastage etc.) from the Gross Production. The estimates of foodgrains production have been obtained in three scenarios i.e. upper (optimistic), expected (normal) and lower (pessimistic) level.

As calorie requirements vary across the age groups of population, the traditional method of calculating food requirement based on per capita norm suffers from the problem of averaging and thus may give a value wide of the true food requirement. Hence, as a first step, the present study attempts to estimate the population by different age groups with the help of the population projections at state level which are based on Sample Registration System by the technical group, 1996, Registrar General, India, using 1996 as the base year. Thereafter, the separate foodgrains requirement on the basis of age groups has been estimated and summed up to project the total foodgrains requirement. The projected food-grains requirement (separately for cereals and pulses) is based on least cost balanced diets recommended by Nutrition Advisory Committee of the Indian Council of Medical Research (ICMR) for the people in Indian context. The food-grains requirements were estimated at retail level, which consist of allowance at the physiological level plus tentative allowance of 10 per cent made for kitchen and other wastages. It is assumed in analysis that the foodgrains requirement for human consumption will increase in same manner as that for non-human consumption.

3. Methodology

The study considers the regression analysis of time series data and other forecasting techniques like Exponential Smoothing and Moving Averages for making the projections of foodgrains. The regression models used in regression analysis are Linear, Quadratic, Modified Exponential and Exponential. The analysis of forecasting of production assumes that the past trends of production will continue in future.

(a) Criteria to determine the adequacy of forecasting model

The criterion to determine the adequacy of a regression model in general are the significance of estimates of parameters, detection of serial correlation, adjusted R^2 and the sign of the estimated coefficients. The significance of individual parameter was tested by performing "t" test. In case of existence of serial correlation, there is underestimation of true variance and the usual tests of significance are not valid. Therefore, before proceeding for regression models to use for projections, the Durbin-Watson (d statistic) was used to check the serial correlation.

It was found that the regression techniques are not suitable for the production trends of cereals and pulses in the State of Haryana either due to the existence of serial correlation or non-significance of the estimates of parameters and therefore we could not use these techniques for the projections. As a second step we proceeded for other forecasting techniques i.e. Moving averages and Exponential methods as these techniques are able to deal directly with serial correlation in time series data while regression based techniques are not. Moving Averages used in forecasting includes Simple Moving Average (SMA) and Double Moving Average (DMA) methods. Exponential Smoothing used in forecasting in the present analysis includes Simple Exponential Smoothing (SES), Double Exponential Smoothing (DES) and Triple Exponential Smoothing (TES). The SMA or SES fits for data which is basically constant and have no trend. The DMA or DES techniques is appropriate for the linear trend while Triple Exponential Smoothing is appropriate for data which shows curvature.

The Choice of technique between SMA and SES or DMA and DES is carried out through the criteria of Mean Square Error (MSE) and the forecasting method, which gives the smallest MSE, has been selected. The MSE is calculated as,

$$MSE = \frac{1}{n} \sum_{i=1}^n (\text{forecast}_i - \text{actual}_i)$$

Since MSE depends on actual production, the estimates of which are not available. Therefore in the present analysis, only for the comparison purposes, an extra exercise is prepared to make forecast on the basis of first ten years i.e. from 1984-85 to 1993-94 and the forecast of next five years were i.e. from 1994-95 to 1998-99, compared to the actual values.

(b) Methods in forecasting of foodgrains

It was found that the DMA technique was suitable for the projection of cereals and SMA technique was suitable for the projection of pulses in the state. The brief description for the SMA and DMA is given below.

(i) Simple Moving Average

The SMA is used with the assumption of a constant pattern and is intended for data having no trend. The model for the response in period t is $y_t = \hat{a} + \varepsilon_t$ where ε_t is random variable with mean 0 and variance σ^2_{ε} and "a" is unknown parameter which should be estimated to forecast the future values. If all the data used in analysis is given equal weight and least square criterion is used to estimate "a" then it can be shown that

$$\hat{a} = \frac{1}{N} \sum_{t=N+1}^t Y_t = M_t$$

at the end of period t, the forecast for period T is just $y_{(t+T)} = M_t$ where M_t (or $M_t^{(1)}$) is called N period moving average.

(ii) Double Moving Average

If the data has linear trend and SMA technique is applied then bias is observed which equals $(N-1/2)b$, where b is the slope of the linear trend. In order to correct this bias DMA can be calculated. The equation used in forecasting which uses DMA and able to correct the bias is $Y_{t+T} = a_t + b_t \cdot T$ where T is the number of time periods from the present time, to the period to be forecasted and $a_t = 2M_t^{(1)} - M_t^{(2)}$, $b_t = (2/N-1) (M_t^{(1)} - M_t^{(2)})$, where $M_t^{(1)}$ is moving average and $M_t^{(2)}$ refers to the double moving average i.e. an average of the moving averages.

(c) Prediction Interval in Forecasting

Forecasting gives a prediction about future events with the assumption that the process will behave in future as it did it in the recent past and the model form used in forecasting is correct and that the true parameters do not change. In most situations these assumptions are not correct and the applied process changes with time, which decreases the forecasting accuracy. The accuracy is described by the variance of the forecast error. Even if the forecast error does not change over time, the forecast will differ from the actual variable because of the random variation in the process and errors in estimating the parameter in the model. Thus the variance of forecast error is a function of the variance of the process and the sampling variances of the statistics used to estimate model parameters. Adding and subtracting a multiple of standard deviation of forecast error can convert the point estimate converted into prediction interval that may be described an uncertainty associated with a forecast. In the present analysis, the 95% prediction interval for the periods has been determined and the forecasting interval at the probability level of 0.95 is $\hat{y}_{t+T} + 1.96 \sigma_{et}$ i.e. our forecast in 95 % cases may vary between $\hat{y}_{t+T} + 1.96 \sigma_{et}$ (upper range level) and $\hat{y}_{t+T} - 1.96 \sigma_{et}$ (lower range level) and the expected value is the average of these two estimated values. The methods of determination of confidence interval are different for different approaches.

An estimate of the standard deviation of the forecasting error σ_{et}^2 is necessary to compute the forecasting interval which is a function of σ_e^2 i.e. variance in production process. (Brown, 1962) reports a study involving relationship between the standard deviation of forecast error, σ_{et} and the average demand rate, (a process variable) was found i.e. $\sigma_e = 0.82a^{0.75}$. The same is equivalent to

$$\Delta = 0.66a^{0.75} \text{ by using,}$$

assuming forecast error is normally distributed with mean μ and variance σ_e^2 (Johnson and Montgomery, 1976). However, these relationships help to determine the prediction interval in forecasting methods other than regression based techniques. The estimation of σ_{et}^2 helps to observe the uncertainty in production and higher value of σ_{et}^2 means that the gap between upper and lower level is high.

(d) Conceptual framework for the estimation of foodgrain requirement

The estimation of foodgrains requirement for a particular age group depends on the per capita requirement at retail level of that age group and its corresponding population. To convert per capita foodgrains requirement at retail level by the physiological level, a tentative allowance of 10 per cent is made for kitchen and other wastages (ICMR, 1984).

The per capita requirement at retail level for a specific age group

= Per capita requirement for specific age group at physiological level $\times 1.1$.

The requirement (S_{ij}) either for cereals or pulses for the particular i^{th} age group of the j^{th} state for a year is,

$$S_{ij} = r_{ik} G_{ijt} \times 365 \quad \text{where, } i = 1, 2, 3, \dots, n \text{ (age groups) and } j = 1, 2, 3, \dots, m \text{ (states) and,}$$

r_{ik} refers to per day per capita requirement of k^{th} food group (cereals or pulses) for i^{th} age group, G_{ijt} refers to the population of i^{th} age group for j^{th} state at time t . Summation of S_{ij} gives the total requirement at state level for all the age groups i.e. the total requirement (R) either for cereals or pulses for a year for the Haryana state at time t is,

$$R_t = \sum_{i=1}^n S_{ij} \quad \text{here 'j' refers for the Haryana state and 't' refers for the projection years i.e. 2006 or 2011.}$$

As per ICMR norms the per day balanced diet requirement by age groups for different foodstuffs is given for 1–3 years, 4–6 years, 10–12 years (boys), 10–12 years (girls), adults (men) and adults (women). The estimation of foodgrains requirement requires the corresponding population figures for the groups, which were estimated, as on 1st March, with the help of projections based on Sample Registration System by the technical group, 1996, Registrar General, India.

The food requirement for the age group 7–9 years has been calculated on the basis of average calorie requirement of 4–7 years (children), 10–12 years (boys) and 10–12 years (girls). The diet requirements for adult male and females being taken as that needed for moderate work requirement, rather than a weighted average of sedentary, heavy and moderate work as adequate data is not available for calculating relevant weights.

(e) Approach for demographic projections by age groups

In order to construct the population, the Compound Annual Growth Rate (CAGR) was calculated between 1991 to 1996, 1996 to 2001, 2001 to 2006 and 2006 to 2011. On the basis of this CAGR, the total population figures for the year from 1991 to 2011, as on 1st March, was constructed which helped out to estimate the population figures by age groups.

Let P_1, P_2, \dots, P_{21} refers to the total population as on 1st March, for the year 1991, 1992, 2011 respectively and X_0, X_1, X_2, \dots refers to the population for 0 years *, 1 year, 2 years etc.

Then age-wise population distribution as on 1st March for the year 2006 is $X_0 = P_{16} - P_{15}, X_1 = P_{15} - P_{14}, X_2 = P_{14} - P_{13}, \dots$ and so on and similarly for the year 2011 is $X_0 = P_{21} - P_{20}, X_1 = P_{20} - P_{19}, \text{ and } X_2 = P_{19} - P_{18} \text{ etc.}$

If G_1, G_2, G_3 and G_4 refers to the population of 1–3 years, 4–6 years, 7–9 years and 10–12 years respectively then,

$$G_1 = \sum_{i=1}^3 X_i, \quad G_2 = \sum_{i=4}^6 X_i, \quad G_3 = \sum_{i=7}^9 X_i, \quad \text{and } G_4 = \sum_{i=10}^{12} X_i,$$

and remaining population is, $G_R = G_T - [\sum_{i=1}^4 G_i + G_0]$

where G_T refers to the total population and here G_0 (population of age of zero years) = X_0

Separate population of male and female has been determined on the basis of latest sex ratio available and it is assumed that it is same for the projection years. The approach for demographic estimations also assumes that there is no inter state migration during the period of analysis.

(f) *Specification of variables and data*

The forecasting in the present study uses the time series data of foodgrains productions (cereals and pulses separately) from 1984-85 to 1998-99 in which the year 1984-85 reveals the base period. The analysis is restricted for the foodgrain crops, which include cereals and pulses, and our focus has been to deal these groups separately rather than their aggregates because of recognized role of pulses in the area of nutritional balance in the human diet. The cereals and pulses includes the following crops :

- (i) *Cereals* : Rice, Wheat, Jowar, Bajra, Maize, Ragi, Barley and small millets.

- (ii) *Pulses* : Gram, Tur and other Pulses.

An attempt has been made to embody the latest available data on related economic variables at the time of analysis. The study is exclusively based on the secondary data obtained from the various issues of Economic Surveys (Ministry of Finance), Indian Agriculture in Brief (Directorate of Economic and Statistics, Ministry of Agriculture). The data on population has been collected from the census of population (different series). Population projections at state level which are based on Sample Registration System by the technical group, 1996, Registrar General India, using 1996 as the base year, is collected from Statistical out line of India 1999-2000. Tata Services Limited, Department of Economics and Statistics, Bombay House. The data on balanced diet for various groups is based on the recommendations of dietary allowances prepared by the Indian Council of Medical Research (ICMR, 1984).

4. RESULTS AND DISCUSSION

Projections of foodgrains production

The projections of food grains separately for the cereals and pulses for the State of Haryana at lower (pessimistic), expected (normal) and upper (optimistic) level for the year 2005-06 and 2010-11 is presented in the table 1. The estimated value of σ_{et1} and σ_{et2} to determine the prediction interval were 869.58 and 968.89 for the cereals, and 72.76 and 69.80 for the pulses for the two time periods.

Table-1
Forecasted production of Cereals and Pulses for the year 2005-06 and 2010-11

Crop groups	Cereals		Pulses	
	2005-06	2010-11	2005-06	2010-11
Forecasted gross production	14168.86	16032.56	395.78	395.78
95 per cent forecasted gross production prediction interval	14168.86+ 1704.37	16032.56+ 1899.02	395.78 +142.60	395.78 +136.80
Forecasted net production	Lower range level	10906.42	221.53	226.60
	Expected range level	12397.75	346.30	346.30
	Upper range level	13889.07	15690.13	471.08

The scrutiny of table 1 reveals that the forecast of the production of foodgrains in 2005-06 at lower range level is 11127.95 thousand tonnes with break up of 10906.42 thousand tonnes for cereals and 221.53 thousand tonnes for the pulses. By the year 2010-11, the production will be 12593.44 thousand tonnes with the break up of 12366.84 thousand tonnes for cereals and 226.60 thousand tonnes for pulses.

At upper range level, the production of foodgrains in 2005-06 is forecasted to be 14360.15 thousand tonnes with break up of 13889.07 thousand tonnes for cereals and 471.08 thousand tonnes for pulses. By the year 2010-11, the production will be 16136.15 thousand tonnes with the break up of 15690.13 thousand tonnes for cereals and 446.02 thousand tonnes for pulses.

The foodgrains production in Haryana at the expected range level in 2005-06 is forecasted to be 12744.05 thousand tonnes

which will further grow to 14374.79 thousand tonnes 2010-11. There will be a phenomenal growth in the state in the production of cereals from 12397.75 thousand tonnes in 2005-06 to 14028.49 thousand tonnes in 2010-11. The production of pulses in 2005-06 is 346.30 thousand tonnes and shows same stagnancy level in 2010-11.

Projections of foodgrains requirement

The estimation of foodgrains requirement require the corresponding population figures (except the age group of zero year) for the different age groups, which have been estimated as on 1st March, for the year 2006 and 2011. The estimated population distribution for the State of Haryana by different age groups required for the projection of foodgrains requirement for the two time periods is shown in fig. 1 and 2.

*The population of zero years refers to those children who have to complete or have completed 364 days but not 365 days.

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The projections for food grain requirement by different age groups separately for cereals and pulses, on the basis of balanced diet has been estimated for the year 2006 and 2011 and the same is given in Table 2. On the basis of constructed population distribution by age groups and balanced diet recommendation for cereals and pulses, the estimated projections shows that the food grains requirement for the Haryana state will be 4240.43 and 4597.64 thousand tonnes for the year 2006 and 2011 respectively. The break up will be 3845.59 and 4170.87 thousand tonnes for the cereals and 394.84 and 426.77 thousand tonnes of pulses for the two time periods. The requirement for food grains in 2006 by different age groups will be highest in adults (men) i.e. 2114.24

thousand tonnes followed by 1556.19 thousand tonnes for adults (women), 142.26 thousand tonnes for 7–9 years (children), 127.12 thousand tonnes for 10–12 years (boys), 120.01 thousand tonnes for 4–6 years (children), 100.51 thousand tonnes for 10–12 years (girls) and 80.1 thousand tonnes for 1–3 years (infants). By the year 2011, the food grains requirement will be highest in adults (men) i.e. 2344.92 thousand tonnes followed by 1725.99 thousand tonnes for adults (women), 143.80 thousand tonnes for 7–9 years (children), 121.23 thousand tonnes for 4–6 years (children), 99.10 thousand tonnes for 10–12 years (boys), 78.35 thousand tonnes for 10–12 years (girls), 84.31 thousand tonnes for 1–3 years (infants).

Table-2
Forecasted requirement* for cereals and pulses by age groups in 2006 and 2011

(Thousand tonnes)

Food groups >>		Cereals		Pulses	
		2006	2011	2006	2011
Year >> /Age groups ^v					
1–3 years		66.75	70.26	13.35	14.05
4–6 years		106.24	107.32	13.77	13.91
7–9 years		127.33	128.70	14.93	15.10
10–12 years	} Boys	114.82	89.51	12.30	9.59
		Girls	89.87	70.06	10.64
Adults	} Men	1928.78	2139.23	185.46	205.69
		Women	1411.80	1565.85	144.39
Total		3845.59	4170.93	394.84	426.77

*Forecasted requirement is at retail level.

5. Conclusion and suggestion

One of the facts for any state or region in India is prevailing poverty, which influences calorie intake. A large part of this calorie intake is derived from the consumption of cereals in diet. The availability of pulses also have a significant role to provide the nutritional balance in Indian context where the population is predominantly vegetarian. An analysis of the gap structure of the food grains production and requirement brought out many interesting features of food population relationships in the state. It is observed that the state of Haryana has a wide role to provide the food security to the nation. The estimates of food grains production and requirement indicate that overall there will be large surplus in case of cereals while the pulses requirement will continue to be in deficit condition due to stagnant growth rate of production. The total food grain surplus in 2005-06 is forecasted to be 8503.62 thousand tonnes which increased to 9777.15 thousand tonnes in 2010-11. The net surplus of cereals available in the state is forecasted to be

8552.16 and 9857.62 thousand tonnes for the year 2005-06 and 2010-11, which is about 68-98 and 70.27 per cent of net forecasted production at expected range level for the year 2005-06 and 2010-11 respectively. If it is assumed that the consumption in the state is as per the balanced diet norms and distribution is proper with no constraints of purchasing power then, it is the available marketable surplus of cereals, which can be made available to the central pool and diverted for the exports. However, in case of pulses, the situation is different and the state needs to expand the production either by increasing production or area or both.

The per capita per day availability of food grains, excluding 0 years population age group#, in the state in year 2005-06 is forecasted to be 1634.61 grams which increased to 1710.08 grams on 2010-11. The estimated per capita per day availability (excluding 0 years population age group) of cereals would be 1590.19 and 1668.88 grams for the year 2005-06 and 2010-11 while the per capita per day availability of pulses

#The zero population age group is not considered in estimation of per capita availability of food grains because of their non-significant role in the consumption of the food grains.

is 44.42 and 41.20 for the same time periods. The estimated ranges i.e. pessimistic range and optimistic range in which the per capita per day availability for cereals may vary is 1398.90 to 1781.47 grams and 1471.20 to 1866.55 for the year 2005-06 and 2010-11. The estimated limits for the pulses are 28.41 to 60.42 grams and 29.96 to 53.06 grams for the same periods.

The liberalization regime propounds the concept of cultivation of crops based on free trade and comparative cost advantage, which means diversion of food grains crop to profitable commercial crops. If the diversion is at the cost of cereal crops, then the extent of diversion needs to be examined on the basis of food security levels. However, the diversion may be profitable for the farmers of the state but may not be advantageous for the nation as a whole from the food security point of view. Also the adequacy of food grains at state level does not guarantee the availability of food grains at household level until and unless distribution is proper and there are no constraints of purchasing power for the poor segment of population. This is particularly true for the segment of population living below the poverty line and unable to get two meals in a day and facing hunger. In these circumstances the public distribution system, which is one of the most important instruments in providing food security at household level, should be efficient alongwith the development of programmes in which the surplus food grains can be used as wage goods.

It is a well established fact when the resources (especially land) and technology constraints limits the aggregate food production its negative impact on food security can be seen not only at household level but also on state, regional and national level. It is estimated that about 50 per cent of total geographical area in the state of recent affected with the problems of alkainity, salinity, water logging and soil erosion. A large part of total cultivable geographical area of the state is already under plough and there is very less scope to bring additional area under cultivation. Under these circumstances, the degraded land should be reclaimed with proper soil conservation measures to maintain the fertility status of the soil.

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"KISAN CALL CENTRE—DIAL TOLL FREE NO. 1551 FOR EXPERTS ADVICE ON ANY FARM RELATED PROBLEMS"

Estimating Export Competitiveness of Chillies from Punjab State

—*A. S. BHULLAR, R. S. SIDHU AND M. S. TOOR

Punjab agriculture is cited as a case of stupendous success in the history of agricultural growth and development in India. The production of food grains increased from 3.4 million tonnes (mt) in 1965-66 to 25.2 mt in 1999-2000, which was largely made possibly by the significant growth in the productivity and production of wheat and rice crops. Adoption of high yielding variety seeds, higher use of chemical fertilizers, expansion in irrigated area, farm mechanization, assured market and input-output price policy have contributed towards this growth in agricultural production. The crop patterns are dominated with rice-wheat rotation covering about 70 per cent of the gross cropped area. The Punjab agriculture now has reached a stage where it is characterised by the stagnating productivity, rising cost of production, falling profits, degradation of soil and water resources due to intensive cultivation of wheat-paddy rotation. It is being felt at the policy level that the crop pattern of the state needs to be diversified from grains to high value crops. Some of the fruit and vegetables are being successfully grown in the state though their area is small. Under the conditions of stable and remunerative prices and assured market, these are considered to be profitable and possessing good scope for exports.

The Government of Punjab has set up Punjab Agricultural Export Corporation in 1997 with the purpose of promoting agricultural exports, especially horticultural crops from Punjab State. Chilli was considered to be the promising alternative in view of growing demand for it and its products in the international market and the suitable agro-climatic conditions for its successful cultivation in the state.

India is a leading country in production and export of chilli with 0.9 million hectare of area, 0.97 million tonnes of production of dry chilli and chilli export worth Rs. 2141 millions. The area under chilli in Punjab was merely 3400 hectares in 2001-02, with production of 5500 tonnes of dry chilli, which can be increased in future, provided marketing system is strengthened and exports are promoted. The present paper therefore, examines the export competitiveness of chilli from Punjab and suggests some policy measures to promote its production and exports.

Trends in Production

Chillies are cultivated in a number of countries of the world. Production-wise and area-wise Asia continues to top the world. India, China and Pakistan are the most important chilli growing countries in Asia. In 2000-01, India was the largest producer of chillies (dry) in the World with an output of about 9.7 lakh

tonnes, followed by China at 4.0 lakh tonnes, Pakistan at 3.0 lakh tonnes and Mexico at 3.0 lakh tonnes. The area and production of chillies have shown consistent rise over time in India. Since mid-eighties the area under chillies has been ranging between 8.0 and 10.0 lakh hectares and production between 5 lakh tonnes to 10 lakh tonnes. The productivity of chillies also showed improvement from 587 kg/ha in 1975-76 to 1070 Kg/ha in 2000-01. The future scope of increasing area and production of chillies depends upon its export as the world consumption of chillies and paprika is going up due to the increasing popularity of ethnic foods, India stands good chances of exporting chillies. What is required is the production of quality chillies, which have demand in the international market?

At present, Andhra Pradesh, Karnataka, Maharashtra, Tamil Nadu and Rajasthan are the important chilli growing states of India. A few decades ago, Punjab, Haryana and Bihar used to account for a considerable share in the production of chillies, but technological breakthrough in the production of rice and wheat crops since early seventies has reduced its area and production in the State of Punjab and Haryana. Andhra Pradesh, Karnataka, Maharashtra and Orissa put together account for 75.0 per cent of the production. Punjab State occupied 3.10 per cent (21.03 thousands hectares) of area and was ranked eighth during 1974-77, which decreased substantially to only 0.46 per cent (4.1 thousand hectares) in 1998-2001. Production-wise, Punjab accounted for 4.61 per cent of production (18.37 thousand tonnes) during 1974-77, which fell to 0.74 per cent (7.00 thousand tonnes) during 1998-2001. There has been significant improvement in the productivity (yield) of chillies over time. Presently, Andhra Pradesh tops in productivity of chillies at 1945 kg/ha followed by Punjab at 1688 kg/ha, Rajasthan at 1064 kg/ha, Arunachal Pradesh at 1272.7 kg/ha and Gujarat at 786 kg/ha.

Export Performance

India exports only 5 to 8 per cent of its output due to high domestic consumption and low international demand for our chillies in the developed countries such as North America and European countries. Despite being low, exports of chilli were also highly fluctuating from year to year. During the triennium of 1999-2002, the average yearly exports were estimated as 58653 tonnes against 4096 tonnes of yearly average during the triennium of 1975-78. The exports grew at a rate of 12.0 per cent per annum during 1975-76 to 2001-02 (table 1). Therefore, since the era of liberalization and globalisation set in motion during 1991, the exports of chillies have performed

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very well. To what extent India will strengthen its position further will depend upon the price competitiveness, quality standards demanded in the international market and changes in the demand due to changes in the tastes of consumers especially in the European countries and America.

India exported 25 thousand tonnes of chilli powder, 40 thousand tonnes of chillies, one thousand tonnes of oleoresins of paprika and 285 kg of oleoresins of chilli at the gross value of Rs. 346.2 crores in 2001-02. USA was the major importer of chilli powder with 8.4 thousand tonnes of imports followed by UAE with 6.47 thousand tonnes and U.K. with 1.7 thousand tonnes. Other importers were Russia, Saudi Arabia, Netherlands, Egypt, Italy, Mexico, Ukraine, Sri Lanka and Singapore with imports ranging between 300–400 tonnes. The largest market for India's chilli exports was Sri Lanka accounting for more than 50 per cent share, followed by USA with 18 per cent share. Malaysia, Bangladesh, Indonesia, Australia, Canada, U.K., Italy, Netherland and UAE also imported chillies from India (table 2).

On the basis of world trade, USA was the main importing market of chilli and imported 3.61 lakh tonnes of chilli. Other major importers were Germany, U.K., Canada, Netherlands, Italy and Belgium as can be seen from table 3. The seventeen main importing countries accounted for more than 70 per cent of the world imports.

Export Competitiveness

Export competitiveness of a vegetable/crop/product from a country or region can be assessed on the basis of (i) relative profitability of the vegetable/crop/product with its competing alternatives in the producing area, (ii) production and domestic price competitiveness of the concerned region with other producing regions, (iii) export price competitiveness and (iv) effectiveness in meeting the international quality standards.

Relative profitability

A vegetable/crop/product is cultivated in an area only if it outcompetes its other alternatives on the basis of profits it generates. Since the demand for chilli is relatively less as compared to other vegetables, the scope of bringing more area under chilli is not very large. Yet the relative profitability of chilli was higher than competing vegetables. The returns over variable cost were Rs. 9126 per acre in case of chillies as compared with Rs. 6890 in case of Okra, Rs. 8428 in case of brinjal, Rs. 5529 in case of sponge guard, Rs. 8506 in case of shimla mirch and Rs. 4603 in case of paddy (table 4). Therefore, the Punjab can produce chillies for export purposes subject to its domestic production and price competitiveness export price competitiveness and quality.

Domestic Production and Price Competitiveness

Production and domestic price competitiveness are the two most important indicators to be looked into, when a region contemplates to encourage exports of a particular commodity to other areas/countries. The Punjab's production and price

competitiveness of chilli with other states was examined with the help of latest productivity levels of different states and prices prevailing in the important markets of production centres.

It was seen that Punjab has comparative advantage in the production and prices of chillies in India. Its average productivity level was relatively higher than that of other major chilli producing states except Andhra Pradesh. It compared fairly well with Andhra Pradesh too recording 81 per cent of Andhra's productivity (table 5). Punjab's productivity was five times higher than Madhya Pradesh, three-times of Tamil Nadu and Maharashtra, two-times higher than Orissa, Uttar Pradesh, West Bengal and Karnataka. Similarly, productivity competitive index stood in favour of Punjab at 137.7 per cent against Rajasthan and 153.6 per cent against Gujarat.

Similarly, the harvest prices of green chilli during 2000-01 were lower in the markets of Punjab as compared to other markets of India except in case of Jaipur (table 6). The wholesale price in Amritsar market was about 65 per cent of the wholesale price in Hyderabad, 54 per cent in Bangalore market, 71 per cent in Ahmedabad market and 60 per cent in Bhubaneswar. The Amritsar wholesale prices ranged between 54 and 63 per cent of the prices prevailing in the metropolitan markets of Mumbai, Chennai, Kolkata and Delhi. Thus, there is a good scope of promoting exports of chilli from Punjab subject to the condition that it can produce the same quality and standards of chilli that are demanded in the international market and matching market infrastructure is developed in the state.

Export Price Competitiveness and Quality Standards

To examine the price competitiveness of chillies from Punjab, the c.i.f. prices of the important importers were compared with c.i.f. prices of chilli from Punjab in those importing markets. The price competitiveness of green chillies for the Middle East and European countries from Punjab State for the year 2001 is presented in table 7. The c.i.f. prices in the Middle East countries of Bahrain, Kuwait and Saudi Arabia were higher than the calculated c.i.f. prices for green chillies from Punjab except in case of exports from Jordan to Kuwait. The c.i.f. prices of chillies in the importing European countries from Punjab were estimated to be much lower than the prices at which chillies are imported to these countries from other exporters. The price of green chilli from Punjab was estimated as Rs. 60.48 per kilogram for Middle East countries and Rs.75.48 kg for European countries whereas the c.i.f. prices in these markets from other exporters varied between Rs. 74.15 kg in Bahrain and Rs. 88.50 kg in Saudi Arabia and between Rs. 121.77 per kg in U.K. and Rs. 231.14 per kg in Germany.

The Punjab State was also competitive to export dry red chillies to Middle East and Europe. The c.i.f. price of dry red chilli from Punjab to the importing countries of Middle East

and Europe was estimated as Rs. 58.33 per kg whereas the c.i.f. prices in these importing countries were much higher (table 8). The Punjab State has thus, competitive edge over other countries in the exports of green and red chillies to the European and Middle East countries. What appears to be the pre-requisite to tap this potential of price competitiveness is meeting the quality standards and other import regulations of the importing countries. European market is highly quality conscious and demands strict adherence to them from the exporters. There appears to be relatively better scope of exports of chillies from Punjab to Middle East countries as they are relatively less stringent on the quality parameters.

Chillies are mainly traded in dried or powdered (ground) form. Developed countries like USA and Western Europe usually specify minimum standards for imports. The British Standards Institution specifies that dried chillies, whole or ground, should contain not more than 11 per cent moisture, 10 per cent total ash and 1.6 per cent maximum of total ash insoluble in hydrochloric acid. Chillies vary greatly in pungency (hotness), which is commonly measured in Scoville units. Mild paprika may measure 30,000 Scoville units while a really pungent African chilli might measure one million Scoville. Developed countries apply tight phyto-sanitary regulations, especially on bacterial contamination and ban certain fumigants. The other major quality considerations in the USA and the European countries are very low levels of aflatoxin, pesticide residue and microbial contaminants like Salmonella, E-coli and low capsaicin content (measure for pungency), which should be 0.10 to 0.45 per cent, and high colour values. Normally chilli with 11 per cent moisture content is traded in the international market but India chillies contain higher moisture content, which sometimes may go even up to 16 per cent (table 9).

Punjab State currently possesses 25 varieties and produces about 10 varieties of chillies, which contain different ranges of colour, pungency, size and shape. The main varieties grown in Punjab namely; Punjab Lal, Punjab Surkh, Punjab Guchhedar, CH-1 and CH-3 meet the moisture and total ash requirements demanded in the international market. However, the capsaicin content in the Punjab's chilli is higher at 0.76 to 0.98 per cent than the International requirement of 0.10 to 0.45 per cent. The colouring matter of Punjab chillies ranges between medium and good. Therefore, the possibilities of export of chilli from Punjab to those markets where it is used as a colouring agent are not encouraging. Yet, the export market of the Middle East countries, where quality measures are not that stringent, can be exploited because Punjab state has competitive edge over other exporters in terms of price.

Conclusions and Policy Issues

Punjab was a traditional grower of chilli, but its area and production declined since the introduction of high yielding varieties of wheat and rice. Though the profitability of chilli competes well with other vegetables and crops, yet its area is small due to less demand and perishability. The area and

production of chilli can be increased if its exports are promoted from the state. The Punjab state was found to be having advantage in export prices of green as well as red dry chillies in the markets of Middle-East and European countries. The basic requirement to tap this potential will be to produce quality chillies that conform to the international standards. For this to happen, two-pronged strategy shall have to be followed. The research efforts towards developing new varieties being demanded in the importing markets shall have to be strengthened and the matching institutional infrastructure shall have to be developed. The overall backward linking strategy from the consumer to the producer is pre-requisite.

Genetic Improvement and Production Technology

- The hybrids/varieties of chilli possessing high yield, deep red in colour, different pungency grades (high, medium, low), high in oleoresin content and producing high dry matter should be developed.
- The major hiccup we face in the export of vegetables including chillies, concerns with the microbial contamination due to polluted irrigation water specially in case of canal water system and sewerage and contact with manure or animal/human faces during harvesting, collecting and other post-harvest handling operations of the produce.
- The germplasm of important varieties grown in the main exporting countries should be imported and then handed over to Punjab Agricultural University for their testing and adoption.

Improving Market System

- The packaging of the produce under hygienic conditions is very important for promoting exports. The packaging of vegetables in plastic crates/CFB boxes is a standard norm in the International market. It also reduces the losses due to mechanical damage and decay in case of perishables to some extent. Therefore, the state government should make efforts to promote the use of plastic crates/CFB boxes, washing, grading, packing house by making them available at low prices.
- We fail to tap the export market of chilli because our drying facility is not scientific. The moisture content in case of sun dried chillies remains higher than 11%. Sun drying also leads to higher aflatoxin levels and other fungal/microbial contaminations. Therefore, scientific drying or tunnel drying of chillies need to be promoted if we wish to strengthen our exports. The state can play a major role for developing this facility through participating in joint ventures or assisting the private entrepreneurs through interest subsidy or investment subsidy.
- The export promotion efforts can further be strengthened by the state through freight subsidization.

- The export-market intelligence wing consisting of technical experts, quality control specialists, exporters and farmers needs to be created in the state so that continuous information on the export related parameters can be generated and supplied to the exporters for their benefit.
- Farmers must be trained about the prevailing procedure and requirements about the exports through organizing the farmer's camps or workshops by the state government or state agricultural university.
- Promoting exports is basically a long run strategy and thus, requires long term policy, planning and perseverance. We should first study the consuming market, the taste and preferences of the people, the quality standards demanded by them, seasonality of demand and then efforts should be made to promote the need based production. The Punjab Agricultural Export Corporation (PAGREXCO) can play a major role in undertaking such studies and then disseminating the gathered information to the producers.
- There is a strong need for setting up in air cargo complex at Amritsar International Airport alongwith cold storage facilities to check the quality deterioration in case there is some delay in the flight to reduce transportation costs and other losses.
- The export calendar for these crops may be prepared by the Agricultural and Processed Food Products

Export Development Authority (APEDA)/ PAGREXCO. Alongwith this, the production calendar of the country showing the seasonality of production is very essential. Punjab should find slots in the production as well as export calendar.

- In case of chilli, our exports are hampered because we are unable to maintain deep red colour and less pungency which are in high demand in the developed countries. A new variety CH-3 is being tested which is considered to be meeting these traits and is thus regarded to have considerable potential for exports.

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Table-1
Exports of chillies from India, 1975-76 to 2001-02

Year	Quantity (tonnes)	Value (Rs. Millions)
1	2	3
1975-76	3532	31.81
1976-77	3129	27.22
1977-78	5627	51.15
1978-79	24630	195.46
1979-80	N.A.	N.A.
1980-81	7682	56.0
1981-82	4659	42.0
1982-83	12888	124.0
1983-84	10610	88.0
1984-85	8227	97.0
1985-86	1241	20.0
1986-87	4327	50.0
1987-88	6122	83.0
1988-89	7868	172.0

1	2	3
1989-90	11983	258.5
1990-91	24534	275.6
1991-92	33398	979.1
1992-93	16850	678.6
1993-94	28619	669.5
1994-95	26279	571.1
1995-96	56073	1941.5
1996-97	51891	2096.4
1997-98	43450	1401.3
1998-99	41387	1532.10
1999-00	57828	2297.10
2000-01	53161	1852.20
2001-02	64964	2141.20

Table-2
India's country-wise export of chillies and chilli products 2001-02

(Rs. Crores)

Country	Chilli Powder	Chillies	Oleoresins of chillies	Oleoresins of Paprika	Total
Canada	1.58	1.00	—	3.935	6.515
Egypt	1.55	—	—	—	1.55
Iraq	1.66	—	—	—	1.66
Italy	2.17	1.36	0.176	0.415	4.121
Japan	1.40	—	10.323	25.514	37.237
Netherland	1.37	0.40	0.055	0.363	2.188
Russia	2.58	—	—	0.084	2.664
Saudi Arabia	2.11	—	—	—	2.11
Singapore	1.77	1.17	11.439	4.349	18.728
U.K.	6.58	1.97	—	8.140	16.69
USA	34.83	23.54	2.916	11.751	73.037
Bangladesh	0.79	5.17	—	—	5.96
Indonesia	—	6.40	—	—	6.40
Israel	—	1.53	0.213	1.083	2.826
Malaysia	0.69	6.83	—	—	7.52
Mexico	1.26	3.83	4.964	4.833	14.887
Pakistan	0.40	4.45	0.001	—	4.85
Sri Lanka	0.97	56.74	—	—	57.711
UAE	0.76	2.42	0.755	0.263	3.183
China PRP	—	—	0.231	3.547	1.018
France	0.62	—	0.238	9.944	4.398
Germany	0.37	—	1.152	19.533	10.552
Spain	0.59	—	—	6.954	21.275
Korea Rep.	—	—	—	0.021	6.954
South Africa	1.03	0.38	22.507	—	1.431
Total	65.08	116.09	55.080	109.932	346.182

Table-3
Major importing countries of Chillies, 2001

Sl. No.	Country	Imports—Qts. (Mt.)	Percentage
1.	Germany	260043	18.79
2.	China	3455	0.25
3.	Belgium	14830	1.07
4.	Canada	90441	6.53
5.	Denmark	16368	1.18
6.	Italy	42353	3.06
7.	Japan	21602	1.56
8.	Lebanon	3960	0.28
9.	Mexico	4945	0.36
10.	Netherlands	41577	3.00
11.	Spain	4723	0.34
12.	Kuwait	8041	0.58
13.	Russian Federation	18372	1.33
14.	Saudi Arabia	8593	0.62
15.	Singapore	11813	0.85
16.	United Kingdom	90230	6.52
17.	United States of America	361019	26.08
Total		1002365	72.42
World Imports		1383965	100.00

Source : FAO data base.

Table-4
Relative profitability of kharif vegetables and paddy in Punjab, 1998-99

(Rs./acre)

Crop	Gross returns	Vriable cost	Returns over variable cost
Chillies	24000	14874	9126
Okra	14319	7429	6890
Brinjal	15617	7189	8428
Sponge Gourd	11958	6429	5529
Shimla Mirch	19060	10554	8506
Rice	9950	5347	4603

Source : Singh, Gurpreet, 1999.

Table-5
Inter-State Production Competitiveness of Chillies in India, 1999-2001

Major States	Average Productivity 1998-2001	Competitive Index (%)
Andhra Pradesh	2074.2	81.395
Karnataka	845.1	199.775
Orissa	853.2	197.879
Rajasthan	1226.3	137.674
Maharashtra	561.4	300.730
West Bengal	873.9	193.191
Tamil Nadu	511.1	306.351
Gujarat	1099.3	153.580
Madhya Pradesh	349.5	483.062
Uttar Pradesh	784.6	215.180
Punjab	1688.3	100

Table-6
Index of price competitiveness of chillis in Punjab with other states

Market	Whole Price (June-July) (Av. of 2001-02)	Price Competitiveness Index
Hyderabad	1154	64.81
Bangalore	1381	54.16
Ahmedabad	1058	70.70
Jaipur	624	119.87
Mumbai	1194	62.64
Delhi	913	81.93
Chennai	1371	54.56
Kolkata	1387	53.93
Bhuvneshwar	1250	59.84
Nagpur	1014	73.76
Amritsar	748	100.00

Source : National Horticultural Bulletin, various issues.

Table-7
Export price competitiveness of green chillies from Punjab, 2001

Importing Market	Supplier	c.i.f. price (Rs./kg.)	Price competitiveness index = (c.i.f. price from Punjab/c.i.f. price from other suppliers) 100
EUROPE			
Denmark	Italy	132.02	57.17
Finland	Spain	185.32	40.43
U.K.			
	Kenya	121.77	61.98
	Thailand	198.03	30.15
	Gambia	152.93	49.35
Holland	Thailand	212.40	35.54
Germany	Thailand	231.14	32.66
MIDDLE EAST			
Bahrin	India	72.15	83.84
	Jordan	74.15	81.56
Kuwait	Jordan	36.25	166.84
Saudi Arabia	India	76.00	79.58
	Sri Lanka	88.50	68.33

Average price in Punjab = Rs. 7.48/kg

Packing cost = Rs. 3.00/kg

Transportation cost to Middle East by air = Rs. 50.00/kg

Transportation cost to Europe by air = Rs. 65.00/kg

c.i.f. price to Middle East = Rs. 60.48/kg

c.i.f. price to Europe = Rs. 75.48/kg

Table-8
Export price competitiveness of dry red chillies from Punjab, 2002

Market	Supplier	C.I.F. Price (Rs./kg.)	Price competitiveness Index = (c.i.f. price from Punjab/c.i.f. price from other suppliers)* 100
MIDDLE EAST			
Kuwait	Holland	348.60	16.73
UAE	Holland	243.47	23.95
EUROPE			
Holland	Thailand	239.92	15.97
	Kenya	176.90	32.97
	South Africa	246.87	23.62
U.K.	Kenya	162.41	35.92
	Spain	168.00	34.72
	Ghana	126.20	46.22
	Thailand	258.04	22.60
	Gambia	86.35	67.54

Wholesale price in Punjab = Rs. 36.83/kg

Charges for scientific drying and destemming = Rs. 10.0/kg

Transportation cost by sea to Middle East and Europe = Rs. 11.5/kg

c.i.f. Price to Middle East and Europe = Rs. 58.33/kg

Table-9
U.S. quality standards vis-a-vis Punjab varieties

Item	Required Standard (USA/EU)	Punjab Lal	Punjab Surkh	Punjab Guchhedar	CH-I & CH-3
Moisture	<11%	Attainable	Attainable	Attainable	Attainable
Total Ash	<10%	6.7%	6-7%	6-7%	6-7%
Aflatoxin Level	Low	Not known	Not known	Not known	Not known
Colouring Matter	High	Good	Medium	Good	Medium
Capsaicin Content	0.10-0-45%	0.98	—	0.83	0.76
Scoville Unit	<30,000	>80,000	>30,000	>30,000	>30,000

USE 'AGMARK' GRADED SPICES

Efficiency of Dairy Cattle Markets in Central Alluvial Plains of West Bengal

—Arun Pandit*

1. Introduction

West Bengal is endowed with vast livestock resources, which forms an integral part of the mixed farming system. Dairy India (Dairy India, 1997) reported that it possesses about 10 percent cattle and 21 percent goat population of India which provide a number of benefits in the form of additional earnings, employment and means of transport. Hence, a holistic approach is needed to develop this sector. Though Patil *et al.* (1979), Aiyasami *et al.* (1980), Singh and Patel (1982), Mondal and Pandey (1993), Jadhav *et al.* (1996), Rasane (1996), Khan and Rao (1997), Mulla (1997), Sharma and Singh (1998), Dhaka *et al.* (1999), Rajarajan (2000) and few others conducted research studies about cattle and buffalo marketing in some parts of India, yet unfortunately no attempt has been made to explore the status of cattle marketing in the state of West Bengal. Thus, there is no knowledge of structure, conduct and performance of cattle marketing of the state. This necessitates a thorough analysis regarding livestock marketing in the state. In view of this gap in information an attempt has been made in this paper to study various facets of dairy cattle marketing like, marketing channels, marketing costs and price spread in order to ascertain the efficiency of dairy cattle markets in the Central Alluvial Plains of West Bengal.

2. Methodology

Central Alluvial Plain of Lower gangetic Plains region was selected for the present study which comprises 7 districts, namely, Hooghly, Nadia, Burdwan, Howrah, West Midnapur, East Midnapur and Murshidabad. Hooghly and Nadia were selected for the study due to their higher livestock density. Two markets, with higher animal transactions from each district were purposively selected. The selected markets were Birohi, Birnagar from Nadia and Mayapur, Pandua from Hooghly. The final sample consisted of 30 sellers, 30 buyers and 20 brokers from each of the randomly selected market thus, making a total sample of 120 sellers, 120 buyers and 80 brokers. The data were collected for each of the three seasons, viz, summer, rainy and winter during 2001-02. During the study period 247 local cows, 37 crossbred cows and only 2 Jersey cows were transacted. Analysis for Jersey cow was not carried out owing to their insignificant number.

Initially the marketing channels were identified. For this purpose, animals were chased from the producer till they reached the ultimate buyer. Marketing cost was worked out

separately for seller and buyer for each and every channel. The seller's marketing cost components were animal preparation which included cost of extra feeding; grooming and washing; market fee; transportation; labour; seller's own personal expenditure; feeding of the animals at the market; brokerage and miscellaneous charges, if any. Normally seller prepares the animal some days or even weeks before coming to the market to enhance the production or to give them a better appearance. On the other hand, buyer had to incur marketing cost on feeding the animal at the market, transportation, his own expenditure, market fees, labour, brokerage, miscellaneous charges, if any. In addition to these costs, in the Mayapur and Pandua markets, a levy of one per cent of market price of animal was charged by champadanga Regulated Marketing Society and Pandua Regulated Marketing Committee, respectively from the buyers only. Price spread was worked out by subtracting the net price received by producer farmer from the effective price paid by ultimate buyer. Marketing efficiency was calculated by using Shepherd's (Shepherd, 1965) formula :

$$ME = (V/I) - 1$$

Where,

ME = Index of Marketing efficiency

V = Value of the animal at Ultimate buyer's level

I = Price Spread

3. Results and Discussion

The results in this section have been described under three broad headings, viz., marketing channel, marketing cost, price spread and analysis of marketing efficiency.

3.1 Marketing channels

The following six marketing channels were identified for dairy cow marketing in the study area :

- (1) Farmer — Farmer
- (2) Farmer — Broker — Farmer
- (3) Farmer — Trader — Farmer
- (4) Farmer — Trader — Broker — Farmer
- (5) Farmer — Slaughter Stock Dealer (SSD)
- (6) Farmer — Trader — Slaughter Stock Dealer (SSD)

In the first channel both, sellers and buyers came to the market and had a direct negotiation. This channel was not so popular being evident from the fact that only 2.83 and 2.70

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per cent of total number of local and crossbred cows were transacted through this channel (Table 1). Farmer seller and farmer buyer also came to the market in the second channel, but negotiations were conducted through brokers only. The brokers received brokerage which ultimately reduced the producers share in ultimate buyer's rupee. Overall, only 4.45 and 13.51 per cent of the total sale of local and crossbred cows respectively took place through this channel.

In the third channel, the animal reached to the ultimate buyer through trader only. Fourth channel was same as third channel with the difference of existence of broker in between trader and farmer buyer. However, third channel was turned out to be the most popular among sellers and buyers. About 43 and 54 per cent of the transactions of local and crossbred cows, respectively took place in this channel. Fourth channel was also a major route of animal transaction. In this channel brokers settled the price who caused a lot of inconvenience to the farmers. As soon as farmers came to the market, they were virtually mobbed by the brokers. It was very difficult on the part of farmers to get rid of them. Brokers charged a heavy brokerage from farmers. Sometimes farmer seller/buyer did not know the actual price of the animal, because, brokers tried to prevent the farmer sellers and buyers to come closer. On the other hand, trader seller got benefited by the brokers who not only saved a lot of time of the traders in exchange of a nominal brokerage, but also provided the farmers a lot of false information regarding the animals.

Fifth and sixth channels were used for transaction of the cows meant for slaughtering purpose. In the fifth channel direct negotiations took place between farmer and slaughter stock dealer whereas, cow reached to the slaughter stock dealers via the traders in the sixth channel. No crossbred cow was found in these two channels. About 9 and 8 per cent of the total cows were transacted in fifth and sixth channels, respectively.

3.2 Marketing cost

The marketing cost incurred by seller and buyer for different channels was worked out and is presented in tables 2 and 3. It could be observed from table 2 that the overall average cost incurred by the seller in channel I Rs. 87.59 for local was and Rs. 101.00 for crossbred cow. Marketing cost incurred by seller in the present study was observed to be lower than reported by Rajarajan (2000) for the same type of channel. This could be due to the sellers bringing the animals usually through walking with virtually no transportation cost in this channel in the present investigation. The buyers cost component analysis showed that the overall cost incurred by the buyer for the purchase of local cow was Rs. 155.15 and Rs. 170.50 for a crossbred cow.

In channel II, the broker stood between farmer seller and farmer buyer. The results given in table 2 revealed that seller had to incur Rs. 184.56 and Rs. 224.79 as marketing cost for local and crossbred cow respectively. Among the major cost items, brokerage was found to be the highest in this channel. On the other hand cost of preparation was the major cost in channel I. The analysis of buyer's cost structure revealed that

overall average cost incurred by the buyer for the purchase of local and crossbred cow was Rs. 280.33 and Rs. 321.09, respectively. Market fee constituted the major cost item for buyer in both the channels I and II.

In the third and fourth channels trader entered between farmer seller and farmer buyer. Traders purchased animal at farmer's doorstep and brought them to the market for selling. On an average, a trader incurred Rs. 122.27 and Rs. 134.30 for marketing a local and crossbred cow, respectively. Cost of preparation and transportation were the two major cost components. On the other hand buyer had to pay Rs. 170.44 and Rs. 273.68 in all for purchasing a local and crossbred cow, respectively. Market fee and labour cost were the two major cost items among the different components of costs. Pandua charged the minimum market fee. There was no market fee for sellers at all, but buyers had to pay Rs. 40.00 and Rs. 30.00 only per cow for regular and occasional visitors, respectively. In view of this Pandua market attracted a large number of sellers and buyers and became biggest livestock market in the study area.

Brokers facilitated the negotiation process between trader seller and farmer buyer in the fourth channel. The brokers did not take the ownership of animal in any channel. Their job was merely to bring the sellers and buyers in close contact and help in negotiation process. In return he took a substantial share of the total marketing cost incurred by sellers and buyers. However, a trader incurred Rs. 143.64 and Rs.174.50 for selling a local and crossbred cow, respectively (Table 3). The trader seller spent 35.31 and 46.37 per cent of total marketing cost on preparation of cow for local and crossbred cow, respectively. Transportation and brokerage were the other significant cost items. The farmer buyer, on the other hand, spent Rs. 266.57 and Rs. 399.35 for buying a local and crossbred cow, respectively. Brokerage comprised of more than 40 per cent of total marketing cost, which was quite high and needs to be reduced.

Channels V and VI were used for transacting the cows which were overage or defective like sterile and are generally slaughtered. In channel V farmer came to market to sell the cow directly to slaughter stock dealer (SSD) who were the agents for supplying the animals to the slaughter houses. No crossbred cow was marketed in these two channels. Farmer incurred an expenditure of Rs. 62.17 and slaughter stock dealer incurred Rs. 177.77 for selling and purchasing one cow, respectively. Labour and transportation charges were the major cost items for seller and buyer, respectively. In both channels V and VI, seller did not resort to any extra feeding as the animal was not giving any production.

In channel VI the cow meant for slaughtering reached from farmer to SSD through the trader. A close perusal of table 3 revealed that the marketing cost incurred by trader seller was worked out to be Rs. 84.24, out of which 32.40 and 31.38 per cent constituted the cost of preparation and transportation, respectively. In contrast to channel V, the traders followed the practice of extra feeding of animal in order to improve the

general appearance and body weight. The total cost incurred by SSD buyer was found to be Rs. 142.72 out of which expenses on transportation and market fee accounted for 47.83 and 22.21 per cent of the total cost, respectively. It could be noted that no broker was involved in the transaction of animals meant for slaughtering purpose.

It could be observed from the foregoing analysis, that marketing cost in all the channels was higher in case of crossbred cow than that of local cow. This was because seller and buyer took extra care in preparing and transporting crossbred cow since they were of high quality and likely to command a price premium in the market as compared to local breed. Rasane et. al. (1996), Khan and Rao (1997) and Rajarajan (2000) also reported the similar findings. Farmer seller and farmer buyer generally did not incur any transportation cost due to visit of the market by walking. This was partly because they were local people and partly because transportation by vehicle is hard to get and also expensive. On the whole, it could be observed that buyer had to incur higher marketing cost than that of seller. This was mainly due to the difference in market fee and levy.

3.3 Analysis of price spread and marketing efficiency

Analysis of price spread and marketing efficiency gives overall picture regarding efficiency of marketing for a specific marketing channel. It shows as to how much percentage of buyer's rupee is received by the producer, margin earned by the trader and marketing cost incurred by the sellers and buyers. The results of price spread analysis are presented in table 4 separately for each channel.

It could be observed from the table 4, on an average in channel I, farmer's share in the buyer's rupee was 94.35 and 95.60 per cent per local and crossbred cow, respectively. The figures appeared to be higher because there was no intermediary involved between them. The price spread was found to be Rs. 242.74 and Rs. 271.50 which was 5.65 and 4.40 per cent of buyer's rupee for local and crossbred cow, respectively. Producer's share in the buyer's rupee in the present study was found to be higher than observed by Mondal and Pandey (1993) in a study of marketing of milch buffaloes in Haryana which was 83 per cent in the Producer — Consumer/final buyer channel.

In the second channel, the overall price spread accounted for 10.14 per cent for local cow and 8.06 per cent for crossbred cow. Broker took away more than 3 per cent of buyer's rupee as brokerage. The producer shared about 90 and 92 per cent of buyer's rupee for local and crossbred cow, respectively.

In the third channel, trader took a margin of over 6 per cent of buyer's rupee. Price spread was higher in this channel than the earlier channels which was 13.79 and 11.84 per cent of buyer's rupee for local and crossbred cow, respectively. This subsequently reduced the producer's share in the buyer's rupee.

Producer's share was further lower in the fourth channel because of involvement of the broker. On an average, producer took about 83 and 87 per cent of buyer's rupee per local and

crossbred cow, respectively in this channel. Trader's net profit was about 8 and 5 per cent for local and crossbred cow, respectively. Price spread as ultimate buyer's rupee was worked out to be about 17 and 13 per cent for local and crossbred cow, respectively. Rajarajan (2000) made more or less a similar observation in a study of cattle marketing in Tamil Nadu. Producer's share in buyer's rupee, as found to be around 82 and 84 per cent for crossbred and local cow, respectively in Farmer — Trader — Broker — Farmer channel. However the markets of Tamil Nadu appeared to be less efficient being evident from the index of marketing efficiency which was only 3.55 and 4.33 as compared to 4.89 and 6.90 for the similar channel in the present study for local and crossbred cow, respectively.

Only local cows used for slaughtering, were transacted in fifth and sixth channels. Fifth channel was not found in the Pandua market. A perusal of table 4 revealed that the price spread was about 12 and 25 per cent for fifth and sixth channel, respectively. Producer received about 88 and 76 per cent of buyer's rupee, whereas in the sixth channel trader's net margin was about 12 per cent.

From the above price spread analysis, it may be observed that the price spread as a percentage of buyer's rupee was lowest in first channel in which only two parties, i.e. seller and buyer were involved. Conversely the marketing efficiency was highest and producer got maximum share in buyer's rupee. Mondal and Pandey (1993) and Rajarajan (2000) also made similar observations. Their study also concluded that Farmer — Farmer channel was the most efficient among the others. As the number of intermediaries between producer farmer and ultimate buyer increased, the price spread also increased. Simultaneously the producer farmer got lower per cent share of the buyer's rupee. Moreover, producer farmer got higher per cent share of buyer's rupee in case of crossbred cow, because of higher market price with marketing cost at the same time being not proportionately higher. Therefore, the farmer seller/buyer should be advised to sell/buy directly to or from the buyer/seller, and this way producer farmer could get higher percentage of buyer's rupee. Simultaneously the animal rearers should be taught about the price advantage of crossbred cow and should better replace their non-descript stock with that of crossbred cows. Across different channels, producer's share in ultimate buyer's rupee was lowest in sixth channel on account of traders earning a net margin of more than 12 per cent. Thus, price spread was found to be highest in this channel that led to lowest marketing efficiency. Price spread in the present study was found to be higher except in first and second channels (for crossbred cow only) than observed by Mulla (1997) in the dairy cow markets of Karnataka. He found that the price spread as a percentage of buyer's rupee was 9.85 and the marketing efficiency was 9.15.

Suggestions and recommendations

The above discussion leads us to conclude that marketing efficiency is lower in the study area which is mainly due to predominance of non-descript breed, existence of many

channels, higher marketing cost, higher brokerage and margins earned by traders etc. For efficient and orderly marketing following suggestions are being made :

Provision of transportation facilities : Transportation formed a major component of marketing cost of the buyer. Transportation modes were not readily available all the time. Hence, cheap transportation facilities should be made available by constructing village link roads connecting the markets.

Streamlining the brokerage : As has already been stated that brokers create a lot of inconveniences to the sellers and buyers and there was no fixed brokerage in the markets. So it is utmost necessary to fix the brokerage proportionate to their services. The brokerage may be fixed either on the type of animal or on the sale price of the animals.

Market fee rationalization : Wide differences in market fee structure were observed across different markets. Moreover buyer had to pay appreciably higher market fee than their seller counterparts. Some of the buyers opined that the gap should be brought down. Sometimes slip writers took more money than the prescribed. Farmers were generally unaware about the prescribed fee structure. Thus, there is a need for rationalization of market fees. Besides, boards or banners showing market fee rate may be displayed at the market place.

Rational price fixation : Price of the animal should not be determined arbitrarily but on the basis of grades. Grading of animals could be done following their performances and other attributes. Open auction is also a good option for setting the market price.

Cross breeding programme : It was observed during the analysis of marketing channels that majority of cows were of nondescript local breed with very poor milk producing ability which fetched lower price than that of crossbred cows. Thus, farmers be advised to upgrade their indigenous stock by adopting the ongoing cross breeding programme.

Advice regarding most efficient channel : Extension workers should impress upon the farmers to sell their animals in Farmer – Farmer channel which was the most efficient. Producer’s share in ultimate buyer’s rupee could be increased by reduction of trader’s margin and brokerage.

Regulation of the markets : The study suggests to regulate the animal markets similar to foodgrain markets for smooth and effective marketing of animals which will enable the marketing practices to be regulated according to the rule of law and thereby everybody involved in the animal marketing will get his proper share with satisfaction.

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Table-1
Channel-wise distribution of cows

Marketing channel	Local	Crossbred	Jersey
I	7 (2.83)	1 (2.70)	—
II	11 (4.45)	5 (13.51)	—
III	106 (42.91)	20 (54.05)	2 (100.00)
IV	82 (33.21)	11 (29.74)	—
V	22 (8.91)	—	—
VI	19 (7.69)	—	—
Total	2.47 (100.00)	37 (100.00)	2 (100.00)

Note : Figures in parentheses indicate percentage to total.

Table-2

Average marketing cost incurred by seller and buyer in channel I, II and III

(In Rs. per cow)

Sl. No.	Item of cost	Channel I				Channel II				Channel III			
		Seller		Buyer		Seller		Buyer		Seller		Buyer	
		Local	Cross bred	Local	Cross bred	Local	Cross bred	Local	Cross bred	Local	Cross bred	Local	Cross bred
1.	Extra feed	20.55 (23.46)	55.00 (54.46)	—	—	25.81 (13.98)	59.35 (26.40)	—	—	42.50 (34.76)	61.69 (45.93)	—	—
2.	Grooming & washing	6.60 (7.54)	7.50 (7.42)	—	—	5.45 (2.95)	6.87 (3.05)	—	—	4.14 (3.39)	9.18 (6.85)	—	—
3.	Cost of preparation (1+2)	27.15 (31.00)	62.50 (61.88)	—	—	31.26 (16.93)	66.22 (29.45)	—	—	46.64 (38.15)	70.87 (52.87)	—	—
4.	Transportation	7.14 (8.15)	—	—	—	9.09 (4.93)	—	—	—	42.91 (35.09)	22.58 (16.81)	—	21.00 (7.67)
5.	Feed at market	7.00 (7.99)	3.50 (3.47)	8.17 (5.27)	—	6.72 (3.65)	7.70 (3.43)	—	4.30 (1.34)	7.06 (5.77)	7.62 (5.67)	—	—
6.	Market fee	5.71 (6.52)	5.00 (4.95)	85.71 (55.24)	120.00 (70.38)	8.18 (4.43)	4.00 (1.78)	112.00 (39.95)	131.00 (40.80)	4.03 (3.30)	3.90 (2.90)	100.12 (58.74)	173.38 (63.35)
7.	Own expenditure	7.17 (8.18)	—	8.28 (5.34)	10.00 (5.87)	8.00 (4.33)	7.79 (3.47)	9.18 (3.28)	4.39 (1.37)	7.37 (6.03)	7.52 (5.60)	7.95 (4.66)	12.85 (4.70)
8.	Labour	33.42 (38.16)	30.00 (29.70)	33.21 (21.41)	37.50 (21.99)	36.77 (19.92)	30.08 (13.38)	42.27 (15.08)	41.00 (12.77)	14.26 (11.66)	21.81 (16.24)	50.82 (29.82)	58.50 (21.38)
9.	Brokerage	—	—	—	—	84.54 (45.81)	109.00 (48.49)	93.63 (33.40)	123.00 (38.31)	—	—	—	—
10.	Miscellaneous	—	—	1.78 (1.14)	3.00 (1.76)	—	—	0.90 (0.32)	2.00 (0.62)	—	—	1.85 (1.09)	2.05 (0.74)
11.	Levy	—	—	18.00 (11.60)	—	—	—	22.35 (7.97)	15.40 (4.79)	—	—	9.70 (5.69)	5.90 (2.16)
	Total	87.59 (100.00)	101.00 (100.00)	155.15 (100.00)	170.50 (100.00)	184.56 (100.00)	224.79 (100.00)	280.33 (100.00)	321.09 (100.00)	122.27 (100.00)	134.30 (100.00)	170.44 (100.00)	273.68 (100.00)

Note : Figures in parentheses indicate percentage to total cost.

Table-3

Average marketing cost incurred by seller and buyer in channel IV, V and VI

(In Rs. per cow)

Sl. No.	Item of cost	Channel IV				Channel V				Channel VI			
		Seller		Buyer		Seller		Buyer		Seller		Buyer	
		Local	Gross bred	Local	Gross bred	Local	Gross bred	Local	Gross bred	Local	Gross bred	Local	Gross bred
1.	Extra feed	47.08 (32.78)	65.99 (37.82)	—	—	—	—	—	—	23.07 (27.39)	—	—	—
2.	Grooming & washing	3.63 (2.53)	14.92 (8.55)	—	—	6.31 (10.15)	—	—	—	4.22 (5.01)	—	—	—
3.	Cost of preparation (1+2)	50.71 (35.31)	80.91 (46.37)	—	—	6.31 (10.15)	—	—	—	27.29 (32.40)	—	—	—
4.	Transportation	32.53 (22.65)	11.06 (6.34)	3.76 (1.41)	—	—	—	106.30 (59.80)	—	26.44 (31.38)	68.27 (47.83)	—	—
5.	Feed at market	6.52 (4.54)	7.40 (4.24)	—	0.70 (0.18)	4.91 (7.90)	—	6.61 (3.72)	—	7.03 (8.34)	8.04 (5.63)	—	—
6.	Market fee	4.17 (3.28)	4.00 (2.29)	90.63 (34.00)	148.20 (37.11)	7.50 (12.06)	—	29.54 (16.62)	—	3.00 (3.56)	31.68 (22.21)	—	—
7.	Own expenditure	7.64 (4.94)	7.74 (4.44)	6.91 (2.59)	10.45 (2.62)	5.90 (9.49)	—	10.07 (5.66)	—	7.35 (8.73)	8.21 (5.76)	—	—
8.	Labour	14.62 (10.18)	16.39 (9.39)	41.62 (15.61)	52.00 (13.02)	37.55 (60.40)	—	13.14 (7.39)	—	13.13 (15.59)	13.92 (9.75)	—	—
9.	Brokerage	27.45 (19.10)	47.00 (26.93)	114.84 (43.08)	173.00 (43.32)	—	—	—	—	—	—	—	—
10.	Miscellaneous	—	—	0.45 (0.17)	2.00 (0.50)	—	—	2.68 (1.51)	—	—	2.59 (1.81)	—	—
11.	Levy	—	—	8.36 (3.14)	13.00 (3.25)	—	—	9.43 (5.30)	—	—	10.01 (7.01)	—	—
	Total	143.64 (100.00)	174.50 (100.00)	266.57 (100.00)	399.35 (100.00)	62.17 (100.00)	62.17 (100.00)	177.77 (100.00)	84.24 (100.00)	84.24 (100.00)	142.72 (100.00)	142.72 (100.00)	142.72 (100.00)

Note : Figures in parentheses indicate percentage to total cost.

Table-4

Price spread and marketing efficiency

(In Rs. per cow)

Sl. No.	Particular	Channel I		Channel II		Channel III		Channel IV		Channel V		Channel VI	
		Local	Cross bred	Local	Cross bred	Local	Cross bred	Local	Cross bred	Local	Cross bred	Local	Cross bred
1.	Net price received by farmer seller	4055.27 (94.35)	5899.00 (95.60)	4120.17 (89.86)	6225.21 (91.94)	3466.05 (86.21)	6335.65 (87.95)	3689.65 (83.02)	6471.00 (87.33)	1771.97 (88.07)	62.17 (3.09)	1528.89 (76.42)	—
2.	Marketing cost incurred by farmer seller	87.59 (2.04)	101.00 (1.64)	184.56 (4.03)	224.79 (3.32)	—	—	—	—	—	—	—	—
3.	Trader's purchase price	—	—	—	—	3466.05	6335.50	3689.65	6471.00	—	—	1528.89	—
4.	Cost incurred by trader	—	—	—	—	122.27 (3.04)	134.30 (1.86)	143.64 (3.23)	174.50 (2.36)	—	—	84.24 (4.21)	—
5.	Trader's net margin	—	—	—	—	261.68 (6.51)	460.20 (6.39)	344.98 (7.76)	364.50 (4.92)	—	—	244.76 (12.23)	—
6.	Price charged by broker	—	—	178.17 (3.89)	232.00 (3.43)	—	—	142.29 (3.20)	220.00 (2.97)	—	—	—	—
7.	Farmer/SSD buyer's purchase price	4142.86	6000.00	4304.73	6450.00	3850.00	6930.00	4128.27	7010.00	1834.14	—	1857.89	—
8.	Marketing cost incurred by farmer/SSD buyer	155.15 (3.61)	170.50 (2.76)	280.33 (6.11)	321.09 (4.74)	170.44 (4.24)	273.68 (3.80)	266.29 (5.99)	399.35 (5.39)	177.77 (8.84)	—	142.72 (7.14)	—
9.	Effective price paid by farmer/SSD buyer (V)	4298.01 (100.00)	6170.50 (100.00)	4585.06 (100.00)	6771.09 (100.00)	4020.44 (100.00)	7203.68 (100.00)	4444.56 (100.00)	7409.35 (100.00)	2011.91 (100.00)	—	2000.61 (100.00)	—
10.	Price spread (I) (9—1)	242.74 (5.65)	271.50 (4.40)	464.89 (10.14)	545.88 (8.06)	554.39 (13.79)	868.18 (11.84)	754.91 (16.99)	938.35 (12.66)	239.94 (11.93)	—	471.72 (25.08)	—
11.	Marketing efficiency (V/I)—1	16.71	21.73	8.86	11.40	6.25	7.30	4.89	6.90	7.39	—	3.24	—

Note : Figures in parentheses indicate percentage to ultimate buyer's rupee.

(i) एग्री इंफ्रास्ट्रक्चर में बड़े पैमाने पर निवेश की जरूरत : श्रीमती राधा सिंह

मुम्बई. निजी क्षेत्र के निवेश को प्रोत्साहित करने के लिये सरकार ने कृषि एवं संबंधित क्षेत्रों में ढांचागत परियोजनाओं पर पूंजी निवेश सब्सिडी (राज सहायता) प्रदान करने के लिये नई योजना शुरू की है।

केन्द्रीय कृषि सचिव श्रीमती राधा सिंह ने यहां कहा कि पूंजी सब्सिडी योजना के लिये पात्र कृषि ढांचागत परियोजनाओं में डेयरी, मांस, मत्स्य एवं लघु वनोपज पर निवेश शामिल हैं। उन्होंने कहा कि खेती को रोजी-रोटी व जीवन निर्वाह के साधन से उद्योग के लिये खेती की ओर उन्मुख तभी किया जा सकता है, जब सरकार, कंपनियों एवं बैंक कृषि क्षेत्र में निवेश के लिये गठबंधन बनाएं। वे नई तकनीकों में निवेश करें। मजबूत बाजार बनाएं एवं प्रभावी मांग पैदा करें। निजी क्षेत्र को सार्वजनिक क्षेत्र का प्रतिस्पर्धी एवं संपूरक दोनों के रूप में लाने से धन की ताकत एवं कीमत दोनों बढ़ेगी। निजी एवं सार्वजनिक दोनों क्षेत्रों को किसानों व उनके परिवारों के फायदे तथा व्यापार की सार्थकता के लिये संपूरक के रूप में काम करना चाहिए।

सुश्री सिंह ने कहा कि किसानों के खेतों के निकट कटाई पश्चात् प्रबंधन व शीत श्रृंखला ढांचा के विकास के लिये कृषि ढांचागत परियोजनाओं में वृहद स्तर पर निवेश की आवश्यकता है। कृषि मंत्रालय द्वारा स्थापित विशेष समिति के मूल्यांकन के अनुसार कृषि विपणन के लिये ढांचागत विकास हेतु अगले 10 सालों में 11172 करोड़ रु. की आवश्यकता होगी। श्रीमती सिंह ने कहा कि इस निवेश का एक बड़ा हिस्सा सरकार के विशेष सहयोग से निजी क्षेत्र से आने की अपेक्षा की जा सकती है। सरकार के लिये उन क्षेत्रों एवं गतिविधियों से पूरी तरह बाहर आने में समय लग सकता है, जहां तुलनात्मक फायदे नहीं हो सकते, लेकिन संपूरकता एवं प्रतिस्पर्धात्मकता कुछ समय के लिये साथ बने रह सकते हैं। श्रीमती सिंह ने कहा कि कृषि उद्योग एवं निजी क्षेत्र को सहअस्तित्व की पहचान करनी होगी एवं व्यापार मॉडल के विकास में किसानों को विस्तार सेवाएं प्रदान करने के लिये कदम उठाने होंगे। इससे किसान को उत्पाद का विपणन करने में सहायता मिलेगी।

स्रोत :--कृषक जगत, 17-23 जनवरी, 2005 भोपाल (मन्त्र)।

(ii) जननी संस्थान है: भारतीय कृषि अनुसंधान संस्थान

नई दिल्ली. भारतीय कृषि अनुसंधान संस्थान ने अपना 43वां दीक्षांत समारोह आयोजित किया। इस अवसर पर कृषि मंत्री श्री शरद पवार ने कहा कि अपने अस्तित्व की इस महत्वपूर्ण शताब्दी के दौरान इस संस्थान ने कृषि अनुसंधान विकास और शिक्षा के क्षेत्र में देश को नेतृत्व प्रदान किया जिसके कारण अनेक फसलों के उत्पादन और उत्पादकता में आशातीत

प्रगति हुई और इसी से 40 वर्षों के दौरान भारत खाद्यान्नों के आयातक से निर्यातक के रूप में रूपांतरित हो सका। यह कोई छोटी उपलब्धि नहीं है। भारतीय कृषि अनुसंधान परिषद् के संस्थानों और अंतरराष्ट्रीय फसल अनुसंधान संस्थानों में उत्कृष्ट नेतृत्व प्रदान करने वाले कार्मिक प्रदान किये हैं। संस्थान सही मायने में जननी संस्थान कहलाने के योग्य है।

समारोह में एम.एससी. के 76 और पीएच.डी. के 66 छात्रों को डिग्रियां प्रदान की गईं। ये डिग्रियां पीएच.डी. के लिये 19 शिक्षणों में और एम.एससी. के लिये 22 शिक्षणों में प्रदान की गईं। इस अवसर पर, विशिष्ट कृषि वैज्ञानिकों और अध्यापकों को अनेक गरिमापूर्ण पदक भी प्रदान किये गये।

श्री पवार ने कहा कि भारतीय कृषि अनुसंधान परिषद् द्वारा ट्रांसजेनिक एवं कार्यशील जीनोमिक्स पर राष्ट्रीय नेटवर्क परियोजना की शुरुआत से तथा प्रभावी सार्वजनिक-निजी सहभागिता से कृषि जैव प्रौद्योगिकी के क्षेत्र में कुछ बड़ी बीज कंपनियों के एकाधिकार पर नियंत्रण किया जा सकता है। इन उद्देश्यों को हासिल करने में भारतीय कृषि अनुसंधान संस्थान को अग्रणी भूमिका निभानी होगी। संस्थान द्वारा अंतरराष्ट्रीय चावल जीनोम अनुक्रमण परियोजना में किया गया योगदान सराहनीय है।

पिछले एक वर्ष के दौरान संस्थान की उपलब्धियों पर प्रकाश डालते हुए डॉ. सु. नागराजन, निदेशक ने सूचित किया कि गेहूं की छः किस्में पूर्वा (एच डी-2824), ऊर्जा (एच डी-2864), पूसा विशेष (एच डी-2581), सी ओ डब्ल्यू (डब्ल्यू-1) (एच डब्ल्यू-3094), एम ए सी एस-6145 (एच डब्ल्यू-2034), मालव कीर्ति (एच आई-8627) : धान की किस्म पूसा सुगंध-5 (पूसा-2511), मक्का की 2 किस्में पूसा कंपोजिट-3 और ए एच-421 (पी ई एच एम-5) ज्वार की किस्म हाइब्रिड पी सी एच-109, चने की 3 किस्में पूसा-1088, पूसा-1103 और पूसा-1105 : मूंग की किस्म पूसा रत्ना (पूसा-9972) : लोबिया की किस्में वी-578 (पूसा-578) : ब्रसिका की दो किस्में पूसा करिश्मा (एल ई एस-39) और महक (जे डी-6), सोयाबीन की किस्म पूसा-9712 को देश के विभिन्न भागों में खेती के लिये जारी किया गया। आम की दो किस्में पूसा अरूणिमा और पूसा सूर्या जारी की गईं और आम्रपाली आधारित चार आशाजनक हाइब्रिडों की पहचान की गई।

स्रोत :--कृषक जगत, 21-27 फरवरी, 2005 भोपाल (मन्त्र)।

(iii) ठेके पर खेती प्रणाली अपनाने का विचार : श्री पवार

नासिक. केंद्र सरकार कृषि योजना और ठेके पर खेती प्रणाली को अपनाकर अपनी कृषि नीति में व्यापक तब्दीलियां करने पर विचार कर रही है। केंद्रीय कृषि मंत्री श्री शरद पवार ने यहां संवाददाताओं को बताया कि केंद्र सरकार मंत्री उत्पाद बाजार समिति कानून में संशोधन पर विचार कर

रही है ताकि किसानों को उनके उत्पाद किसी भी बाजार में बेचने में मदद मिले। उन्होंने कहा कि ठेके पर खेती प्रणाली में हमें ऋण योजना का विस्तार करने की आवश्यकता होगी। साथ ही प्रति एकड़ कृषि उत्पादन बढ़ाना होगा। सिंचाई की भी पर्याप्त व्यवस्था करनी होगी। कृषि मंत्री ने कहा कि हम अपनी बागवानी और पुष्प खेती नीति को भी बदलने जा रहे हैं। ताकि किसानों की अच्छे बाजार तक पहुंच हो सके।

गेहूँ निर्यात पर फैसला मई के बाद—चालू रबी सीजन में 7.5 करोड़ टन गेहूँ का बंपर उत्पादन होने की संभावना के बावजूद सरकार खरीद पूरी होने पर मई के बाद ही इसके निर्यात के बारे में निर्णय लेगी। यह जानकारी यहां खाद्य सचिव श्री एस. के. टुटेजा ने दी। इसके अलावा उन्होंने कहा कि अगले सीजन के दौरान गन्ने के उत्पादन में भी बढ़ोतरी होने की संभावना है। श्री टुटेजा ने कहा कि मौसम में ठंड का प्रभाव बढ़ने से गेहूँ की फसल को लाभ पहुंचा है। इससे गेहूँ की गुणवत्ता भी पिछले साल के मुकाबले बेहतर होगी। यह अब सदियों में हुई बारिश का परिणाम है।

स्रोत :--कृषक जगत, 28 फरवरी से 6 मार्च, 2005 भोपाल (म.प्र.)।

(iv) कांट्रेक्ट खेती के लिए कानून में बदलाव जरूरी

नई दिल्ली. योजना आयोग के उपाध्यक्ष श्री मोंटेक सिंह आहलूवालिया का कहना है कि देश में कांट्रेक्ट खेती की अवधारणा को वास्तविक रूप प्रदान करने के लिए कृषि कानूनों में व्यापक फेरबदल व संसाधनों का प्रवाह बढ़ाने की आवश्यकता है। इससे उद्योग जगत अपनी आवश्यकताओं की पूर्ति के लिए मंडियों में जाने के बजाय सीधे किसानों के पास जाने को प्रेरित होंगे।

उन्होंने कहा कि संसाधनों व जरूरी ढांचागत सुविधाओं के अभाव के चलते दसवीं पंचवर्षीय योजना के दौरान अभी तक कृषि क्षेत्र की विकास दर मात्र 1.5 फीसदी रही है। इससे देश की अर्थव्यवस्था पर विपरीत प्रभाव

पड़ सकता है। श्री मोंटेक ने कहा कि कृषि व इससे जुड़े क्षेत्रों में न केवल सार्वजनिक निवेश बढ़ाने की जरूरत है, बल्कि कांट्रेक्ट खेती को एक वास्तविकता में बदलने के लिए नए कानून बनाने की भी आवश्यकता है। उन्होंने कहा कि ग्रामीण आबादी के विकास के लिए परंपरागत खेती को छोड़कर मूल्यवर्धित कांट्रेक्ट खेती को अपनाना होगा। अगले सात सालों के दौरान अकेले सिंचाई व जल प्रबंधन के लिए 1,10,000 करोड़ रुपए के निवेश की आवश्यकता होगी और इसमें केन्द्र सरकार को 23,000 करोड़ रुपए का योगदान करना होगा।

श्री मोंटेक ने कहा कि कानून में परिवर्तन आवश्यक हो गया है। नये राष्ट्रीय बागवानी मिशन के तहत धन प्राप्त करने वाले राज्यों कि लिए नए कानून का पालन अनिवार्य किया जाना चाहिए। यह बात नहीं चल सकती कि बागवानी के विकास के लिए राज्यों को धन मिले, लेकिन उन्हें कानून में आवश्यक बदलाव के लिए प्रोत्साहित न किया जाए। कर्नाटक का उदाहरण पेश करते हुए उन्होंने कहा कि वहां की सरकार ने हाल ही में कृषि विपणन कानून में संशोधन किया है ताकि आधुनिक फल एवं सब्जी बाजार खोले जा सकें। बुनियादी ढांचा तैयार करने में आने वाली संसाधन की बाधाओं का जिक्र करते हुए उन्होंने वित्त मंत्री द्वारा 2005-06 के बजट भाषण में घोषित विशेष उद्देश्य कोष का स्वागत किया। उन्होंने कहा कि सबसे निराशाजनक बात यह है कि कृषि की वृद्धि दर में कमी आ रही है।

यह कमी पिछले कुछ सालों से ही नहीं बल्कि नौवीं योजना के दौरान भी देखने को मिली। श्री मोंटेक ने आयोग द्वारा मंजूर मध्यावधि समीक्षा के मसौदे के बारे में इसी हफ्ते प्रधानमंत्री को अवगत कराया है। मध्यावधि समीक्षा में संकेत किया गया है कि कृषि क्षेत्र की समस्याएं केवल एक या दो साल के सूखे का ही परिणाम नहीं हैं। पिछले आठ साल के दौरान कृषि क्षेत्र की वृद्धि दर में कमी देखने को मिली है।

स्रोत :--कृषक जगत, 4-10 अप्रैल, 2005 भोपाल (म.प्र.)।

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