

AGRICULTURAL SITUATION IN INDIA

OCTOBER, 2013



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CONTENTS

PART I

	PAGES
A. GENERAL SURVEY	1
B. ARTICLES	
1. Economics of production of marigold cultivation in Kolhapur and Sangli District of Maharashtra— <i>R. Kolambkar, R. Suryawanshi and H. Shinde</i>	3
2. Status of Agricultural Development in Gujarat and India Since 2000— <i>Deepak Kumar Behera</i>	7
3. Cost and Return analysis of Mandarin Orange—A Case Study in Darjeeling District of West Bengal— <i>Sudhakar Lama and S.C. Sarker</i>	17
C. AGRO-ECONOMIC RESEARCH	
Spread of new varieties of Hybrid Rice and their impact on the overall production and productivity in Madhya Pradesh— <i>A.E.R.C. for Madhya Pradesh and Chhattisgarh Jawaharlal Nehru Krishi Vishwa Vidyalyaya Jabalpur, (M.P.)</i>	25
D. COMMODITY REVIEWS	
(i) Foodgrains	33
(ii) COMMERCIAL CROPS :	35
Oilseeds and Edible Oils	35
Fruits and Vegetables	35
Potato	35
Onion	35
Condiments and Spices	35
Raw Cotton	35
Raw Jute	35

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The Journal is brought out by the Directorate of Economics and Statistics, Ministry of Agriculture. It aims at presenting a factual and integrated picture of the food and agricultural situation in India on month to month basis. The views expressed, if any, are not necessarily those of the Government of India.

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PART II

STATISTICAL TABLES

	PAGES
A. WAGES	
1. Daily Agricultural Wages in Some States— Category-wise	37
1.1 Daily Agricultural Wages in Some States— Operation-wise	
B. PRICES	
2. Wholesale Prices of Certain Important Agricultural Commodities and Animal Husbandry Products at Selected Centres in India.	39
3. Month end Wholesale Prices of some Important Agricultural Commodities in International Market during the year 2013	41
C. CROP PRODUCTION	
4. Sowing and Harvesting Operations Normally in Progress during November, 2013.	43

Abbreviations used :

N.A. —Not Available.

N.Q. —Not Quoted.

N.T. —No Transactions.

N.S. —No Supply/No Stock.

R. —Revised.

M.C. —Market Closed.

N.R. —Not Reported.

Neg. —Negligible.

Kg. —Kilogram.

Q. —Quintal.

(P) —Provisional.

Plus (+) indicates surplus or increase.

Minus (–) indicates deficit or decrease.

A. General Survey

Agriculture :—

Rainfall : With respect to rainfall situation in India, the year is categorized into four seasons : winter season (January-February); pre monsoon (March-May); South west monsoon (June-September) and post monsoon (October-December). South west monsoon accounts for more than 75 per cent of annual rainfall. The actual rainfall received during the post monsoon season 2013, as on 13-11-2013 has been 135.3 mm as against the normal at 96.6 mm.

All India production of food grains : As per the 1st advance estimates released by Ministry of Agriculture on

24-9-2013, production of Kharif foodgrains during 2013-14 is estimated at 129.32 million tonnes compared to 117.18 million tonnes (1st advance estimates) in 2012-13.

Procurement : Procurement of rice as on 2nd September, 2013 was 33.97 million tonnes in Kharif Marketing Season as against 34.79 million tonnes procured last year in the corresponding period. This represents a decrease of 2.36 per cent. Wheat procurement during Rabi Marketing Season 2013-14 is 25.09 million tonnes as compared to 38.11 million tonnes during the corresponding period last year.

TABLE 1—PROCUREMENT IN MILLION TONNES

	2010-11	2011-12	2012-13	2013-14
Rice	34.20	35.04	34.00#	—
Wheat	22.51	28.34	38.15	25.09*
Total	56.71	63.38	71.15	25.09

* Position as on 1-8-2013

#Position as on 19-9-2013.

Off-take: Off-take of rice during the month of August, 2013 was 24.10 lakh tonnes. This comprises 21.08 lakh tonnes under TPDS and 3.02 lakh tonnes under other schemes. In respect of wheat, the total off take was 18.91 lakh tonnes comprising of 17.05 lakh tonnes under TPDS

and 1.86 lakh tonnes under other schemes.

Stocks : Stocks of food-grains (rice and wheat) held by FCI as on September 1, 2013 were 58.93 million tonnes, which is lower by 17.87 per cent compared to the level of 71.75 million tonnes as on June 1, 2012.

TABLE 2—OFF-TAKE AND STOCKS OF FOODGRAINS (MILLION TONNES)

	Off-take			Stocks	
	2011-12	2012-13	2013-14 (Upto August 2013)	Sept. 1, 2012	Sept. 1, 2013
Rice	32.12	32.64	11.88	25.59	20.57
Wheat	24.26	33.21	10.23	46.16	38.36
Total	56.38	65.85	22.11	71.75	58.93

Growth of Economy :—

As per the Provisional Estimates of the Central Statistics Office (CSO), the growth in Gross Domestic Product (GDP) at factor cost at constant (2004-05 prices) is estimated at 5.0 per cent in 2012-13 with agriculture, industry and services registering growth rates of 1.9 per cent, 2.1 per cent and 7.1 per cent respectively. As per the

First Revised Estimates, the growth in GDP at factor cost at constant (2004-05) prices is estimated at 6.2 per cent in 2011-12. At disaggregated level, this (First Revised 2011-12) comprises growth of 3.6 per cent in agriculture and allied activities, 3.5 per cent in industry and 8.2 per cent in services. The growth in GDP is placed at 4.4 per cent in the first quarter of 2013-14.

TABLE 3—GROWTH OF GDP AT FACTOR COST BY ECONOMIC ACTIVITY

(at 2004-05 Prices)

Sector	Growth (in percent)			Percentage Share in GDP		
	2010-11	2011-12 1R	2012-13 (PE)	2010-11 (2R)	2011-12 (1R)	2012-13 (PE)
1. Agriculture, forestry and fishing	7.9	3.6	1.9	14.5	14.1	13.7
2. Industry	9.2	3.5	2.1	28.2	27.5	26.7
a. Mining and quarrying	4.9	-0.6	-0.6	2.2	2.1	2.0
b. Manufacturing	9.7	2.7	1.0	16.2	15.7	15.1
c. Electricity, gas and water supply	5.2	6.5	4.2	1.9	1.9	1.9
d. Construction	10.2	5.6	4.3	7.9	7.9	7.8
3. Services	9.8	8.2	7.1	57.3	58.4	59.6
a. Trade, hotels, transport and communication	12.3	7.0	6.4	27.3	27.5	27.8
b. Financing, insurance, real estate and business services	10.1	11.7	8.6	17.2	18.1	18.7
c. Community, social and personal services	4.3	6.0	6.6	12.8	12.8	13.0
4. GDP at factor cost	9.3	6.2	5.0	100.0	100.0	100.0

1R: 1st Revised Estimates; PE: Provisional Estimates Source : CSO

TABLE 4—QUARTERLY GROWTH RATE GDP (PERCENT)

Sector	2011-12				2012-13				2013-14
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
1 Agriculture, forestry & fishing	5.4	3.2	4.1	2.0	2.9	1.7	1.8	1.4	2.7
2 Industry	5.7	3.8	2.6	2.1	1.8	1.3	2.5	2.7	0.2
a Mining & quarrying	-0.4	-5.3	-2.6	5.2	0.4	1.7	-0.7	-3.1	-2.8
b Manufacturing	7.4	3.1	0.7	0.1	-1.0	0.1	2.5	2.6	-1.2
c Electricity, gas & water supply	6.6	8.4	7.7	3.5	6.2	3.2	4.5	2.8	3.7
d Construction	3.8	6.5	6.9	5.1	7.0	3.1	2.9	4.4	2.8
3 Services	8.9	8.5	8.3	7.3	7.7	7.6	6.7	6.6	6.6
a Trade, hotels, transport & communication	9.5	7.0	6.9	5.1	6.1	6.8	6.4	6.2	3.9
b Financing, insurance, real estate & business services	11.6	12.3	11.4	11.3	9.3	8.3	7.8	9.1	8.9
c Community, social & personal services	3.5	6.5	6.8	6.8	8.9	8.4	5.6	4.0	9.4
4 GDP at factor cost	7.5	6.5	6.0	5.1	5.4	5.2	4.7	4.8	4.4

Source: CSO.

B. Articles

Economics of Production of Marigold Cultivation in Kolhapur and Sangli District of Maharashtra

R. KOLAMBKAR*, R. SURYAWANSHI** AND H. SHINDE***

Introduction

Marigold is a seasonal flower and can be grown round the year. Marigold flowers gained popularity amongst gardeners and dealers on its easy cultivation and wide adaptability. Both leaves and flowers are equally important from medicinal point of view. The essential oils of marigold find use in the perfume industry. Marigold are ideal for cut flowers, especially for making garlands. In popularity as cut flowers, marigolds probably ranks next only to jasmine in India. Marigold is used as the trap crop in the borders to attract the insects attacking the main crop.

In India, during the area under floriculture is (60487.6 hectares). The highest area under floriculture was found in Karnataka (20,780 hectares), followed by Tamil Nadu (16,745 hectares), West Bengal (13,720 hectares), Andhra Pradesh (8,420 hectares). These states together accounted for 98.64 per cent of the total area in the country. The export of flowers have increased from ₹.14.80 crores in 1991-92 to ₹.190.63 crores in 2000-2001 out of which ₹.39.09 crores is the share of cut flowers. Karnataka alone accounts for nearly 75 per cent of total floriculture exports from the country at .10 million and rose dominating at 90 per cent.

The area under floriculture in Maharashtra during 2010-11 was is 15000 hectares, out of which marigold contributes 29 per cent share with an area of 4350 hectares. While the production of floriculture is 64,400 million tones out of which marigold contributes 33,488 million tones which is account to about (52 per cent). Analysis of reasons for variation in the yield and fluctuations in income resulting from marigold cultivation in the command would be useful for the farmers of the India. Hence a study has been undertaken with the objective to estimate cost and returns in marigold production.

Data and Methodology

The Kolhapur and Sangli district of Western Maharashtra were selected purposively for the present study on marigold. Both the district have medium to light type of soil with limited irrigation facilities. The area under marigold in Kolhapur and Sangli district was 1,025 and 1,138 hectares respectively, with an area of 135.23 and 154.00 hectares in Hatkanangale and Miraj tahsils of respective districts. Keeping in view highest acreage under marigold, Hatkanangale and Miraj tahsils were selected for the present study. From each tahsil three villages were selected purposively and from each village 10 sample farmers were selected randomly.

The list of the marigold cultivators was obtained from the revenue records maintained at village level of selected villages. The required number of cultivators from each village was selected randomly. In all, sixty marigold cultivator spread over in six villages formed the total sample size. The survey method of economic investigation was adopted for the work of data collection. A specially designed questionnaire for getting the information on cost of cultivation, marketing and other related aspects was used. The data was collected for the Agricultural year 2011-2012 for summer season. The detailed information about the physical quantities of inputs and their costs, yields and returns were collected in respect of marigold from sample cultivators. The sowing varieties selected by sample farmers were Namdhari, Gold Coin Gold, Inca yellow, Inca orange, Inca gold and Thumbnail sunny, out of which share of Namdhari variety was 85 per cent.

The Simple tabular analysis was carried out to work out the level of input utilization, per hectare cost of cultivation and cost of production of flowers. The collected data were compiled, tabulated and analyzed, to accomplish the objectives of the present study. The collected data were analyzed by using standard Cost Concepts viz., Cost 'A', Cost 'B', and Cost 'C' normally used in farm management studies.

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Cost A = Cost 'A' includes the cost on account of hired human labour, hired plus owned bullock labour, value of manures and fertilizers, planting material, insecticides and pesticides, irrigation charges, depreciation on implements and machinery, land revenue and cesses and interest on working capital.

Cost B = Comprises of Cost 'A' plus the imputed rental value of owned land plus interest rate on owned fixed capital.

Cost C = This cost includes Cost 'B' plus imputed value of family labour charges. The family labour charges considered at rates prevailing in villages.

RESULTS AND DISCUSSION

Selection of the study area:

Village wise distribution of holding is as represented in Table -1.

TABLE 1 –VILLAGE WISE DISTRIBUTION OF SAMPLE CULTIVATORS AND AREA UNDER MARIGOLD

Sr. Name of selected No. villages	Area under marigold covered by sample cultivators (ha)	Total number of sample cultivators selected from each village
1. Rukdi	5.33	10
2. Kumbhoj	4.38	10
3. Herale	4.32	10
4. Mallewadi	6.17	10
5. Toong	4.97	10
6. Erandoli	3.03	10
Total	28.20	60

It was observed from Table –I that highest area under marigold was in Mallewadi village (6.17 hectares) and lowest area was under Erondoli village (3.03 hectares). Observations from Table -I states that area under marigold cultivation increasing rapidly in Western Maharashtra.

Costs and returns structure of marigold

The life period of the crop is 4 months. In view of this, an attempt has been made to analyze in detail per hectare use of inputs, cost of cultivation and profitability of the marigold flower.

Per hectare cost of cultivation of marigold

To facilitate comparison the item wise per hectare cost of cultivation of the marigold of selected families was worked out and same is presented in Table –II.

On examination of the cost data, it was observed that the per hectare total cost of cultivation, Cost C

was ₹.202046.4, in which , share of cost A and Cost B was 53.77 per cent and 95.20 per cent, respectively. The major item of Cost C was input cost, which alone shared 48.41 per cent. The major input was expenditure on seedlings (29.98 per cent). The major item of Cost B was rental value of land (35.41 per cent). The per hectare yield was obtained 124.52 quintals accounting to ₹.429253 as gross income. The Benefit - Cost ratio was estimated to 2.12 indicating there by cultivation of marigold in summer season in Kolhapur and Sangli district is profitable.

TABLE II –PER HECTARE COST OF CULTIVATION OF MARIGOLD

Sr. Cost items No.	Quantity	Rate (`)	Value(`)
1. Hired Human Labour (days)			
Male	65.45	100.49	6577.07
Female	138.5	67.63	(3.25)
			9366.76
			(4.64)
2. Bullock Power (days)	0.29	524.59	152.13
			(0.08)
3. Machine charges (hours)	35.15	73.53	2584.58
			(1.28)
4. Seedlings (Nos.)	356.33	1.7	60576.1
			(29.98)
5. Manure (Quintals)	20.18	125.58	2534.20
			(1.25)
6. Fertilizer (Kg/ha)			
N	136.4	16.72	
P	97.6	19.38	4681.77
K	61.26	8.32	(2.32)
7. Irrigation charges	—	—	5900
			(2.92)
8. Plant protection charges	—	—	5442.46
			(2.69)
Working capital	—	—	97815.07
			(48.41)
9. Interest on working capital @6%	—	—	5868.9
			(2.90)
10. Depreciaiton on farm implements	—	—	4178.30
			(2.07)
11. Land revenue and taxes	—	—	772
			(0.38)
Cost A	—	—	108634.3
			(53.77)
12. Rental value of land	—	—	71542
			(35.41)
13. Interest on fixed capital @10%	—	—	12176
			(6.03)
Cost B	—	—	192352.27
			(95.20)
14. Family labour (days)			
Male	71.63	95.77	6860
Female	40.47	70.03	(3.40)
			2834.11
			(1.40)
Cost C	—	—	202046.4
			(100)
15. Output (Qtls)	124.52	—	429253

Returns from Marigold

The per hectare total cost, total produce, returns and net profit at various level of cost, at Cost A, at Cost B and Cost C were worked out and same are presented in Table - III. It can be seen from the Table - III at the overall level the net returns at Cost C was ₹.227206.6. The per hectare cost of cultivation worked out to ₹.202046.4. This shows that marigold is an economic crop to selected farmers with minimum cost and maximum returns.

Per kg Cost, Returns and Net profit:

The per kilogram cost, returns and net profit were worked out and presented in Table -III

TABLE III - PER KG COSTS, RETURNS AND NET PROFIT OF SAMPLE FAMILIES

Sr. No.	Particulars	Value
1.	Per kilogram cost (₹)	16.23
2.	Per Kilogram Returns (₹)	34.47
3.	Per Kilogram Net Profit (₹)	18.24

It is observed from the Table - III that the per kg cost of production was worked out to ₹.16.22 and per kg net profit was found to ₹.18.24 with per kg net returns of ₹.34.47.

Conclusions

- The per hectare cost of cultivation was ₹. 202046.4 and per hectare net returns was ₹. 227206.6. Major items of cost on Rental value (35.41 per cent), seedlings (29.98 per cent), human labour (12.69 per cent) and interest on fixed capital (6.03 per cent).
- Regarding the profitability of marigold cultivation, crop is found to be profitable at all the cost

levels. Benefit- Cost ratio at Cost A, Cost B and Cost C were 3.95, 2.23 and 2.12 respectively.

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Status of Agricultural Development in Gujarat and India Since 2000

DEEPAK KUMAR BEHERA*

Abstract

This paper analyses the status of agricultural development in terms of growth rate of output and performance of various food & non-food crops from the year 2001-02 to 2010-11. Its primary interest is to compare the agricultural scenario of both Gujarat and India since 2000 because it has been asserted miracle performance of agriculture in Gujarat. There have been a structural shift of crops pattern from traditional to modern crops and production of cotton, rabi wheat, groundnut (commercial crops); fruits, vegetable and milk (high value products) grown rapidly. These crops performance has always better than India during the period but the fluctuation of state domestic product in agriculture is more in Gujarat as compared to India. The agricultural schemes that have been initiated in both Gujarat and India are based on same goals but it has proved to be beneficial in the case of Gujarat agriculture. This study has based on secondary source of information obtained from various governmental publications and existing literature.

Keywords: Agricultural Growth, Gujarat, Crop, Production and Schemes

1. Introduction

Agriculture development is an important component of inclusive growth approach which was the main aim of 11th five year plan and also continuing in the 12th five year plan. The Plan had targeted 4 percent growth in agriculture as one of major challenges out of the 27 monitorable targets relevant for inclusiveness but which had be missed in the Eleventh Plan, must be achieved in the Twelfth Plan as it is critical for inclusive growth. The growth of agriculture and allied sectors is still a critical factor in the overall growth performance of the Gujarat economy. In 2011-12(Q), it accounted for 11.3 percent of the state domestic product compared to 11.4 percent in 2010-11(Socio Economic Survey of Gujarat, 2012). As compared to Gujarat the growth of agriculture and allied activities in India continues to be a critical factor in overall performance of Indian economy whose share in GDP was at 14.1 percent in 2011-12 while the growth in GDP was 3.6 percent during the same year (Economic Survey, 2012).

In the present day in India there are three problems in the agriculture and allied sector such as reducing real

agricultural GDP and land productivity, food insecurity and rising food inflation. These problems can solve by the accelerating growth of the agriculture through technical changes in agricultural policy such as continuous location specific generation and transfer of land augmenting and labour using technical change, generating mass professional human resources, increasing public expenditure, revamp the pricing system of farm input and reorient the existing model and organization (Desai et al., 2011). Chand (2010) explained that achieving 4 percent growth rate in agriculture, there is necessary to using more fertilizer, technology, more area under fruits and vegetable, public and private investment and terms of trade in agriculture.

Dholakia (2002) examines that during the period 1980 to 2001, economic reforms and development strategy of India as well as Gujarat has more emphasized to open their economy and higher priority given to industrial activities and private players and less importance to primary sector and service sector. Bagchi et al. (2005) explained that during the period 1970-2000, agriculture was stagnant and other sector grew very well. Dikit (2009) explains that agriculture is playing a major role of Gujarat's high growth story. Shah et al. and Gulati et al. (2009) represent that the Gujarat has high and steady growth since 2000 and this growth has driven by endogenous factors and role of government. These endogenous factors are market access, agricultural research and extension, infrastructural development in terms of power and road and irrigation including ground water irrigation, canal irrigation. The sources of growth are wheat production, Bt cotton expansion, high value product including livestock, fruits and vegetables etc. Shah at al. (2009) represented the region wise analysis of growth pattern of agriculture performance after 2000 has driven by massive expansion in Rabi wheat cultivation and rapid expansion in Bt cotton area and yield.

In this above background the specific objective is to analyse the pattern of agricultural development in both Gujarat and India from the period 2001-02 to 2010-12. The study has used secondary source of information for the analysis of agricultural situation of Gujarat and India since 2000. The data has been obtained from Socio-Economic Review of Gujarat State, Economic Survey of Government

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of India, Agricultural statistics report from the ministry of agriculture of Gujarat and India as well. The analysis has been conducted for the production, productivity and areas of various crops i.e. cereals, pulses, total food grains, wheat, oilseeds, cotton and groundnut; and high value crops i.e. fruit, vegetable, milk, egg, fish and wool etc during the period.

This paper has been divided into five sections, section 1 provides the introduction. Section 2 recapitulated some of the important features of agricultural development record i.e. the growth rate of agriculture and allied sector in Gujarat and India in term of production, productivity and area coverage of various food and non-food crops. Sections 3 and 4 have discussed the recent policy initiatives of the government in the perspective of agricultural development and inclusive growth. Concluding observations are made in the last section.

2. Agricultural Development of Gujarat Since 2000

Agriculture is a state subject and its development and achievement is based on the respective state Government. In Gujarat, the agriculture growth has been rapidly increasing than India as a whole since 2000's. Agricultural development means all the components of agriculture and allied activities such as food crops, non-food crop, horticulture and animal husbandry etc. The production, area and productivity of these components of agriculture sector are increasing during the period.

The table 2.1 data shows that from the period 2001-02 the growth of agriculture has achieved miracle

performance. This achievement in agriculture growth has been influenced by some exogenous and endogenous factors which have promoted faster and more inclusive growth in agriculture. The exogenous factors is common to everyone in India which are good monsoon or good rainfall, high MSP of wheat, cotton and other crops. The endogenous factors are the role of Government's innovative agricultural planning strategy. The major driving policies of Gujarat agriculture are improved farmers market access through the Agricultural Produce Marketing Committee (APMC) Act, Promote diversification to high value crops, especially fruits and vegetables through offering capital subsidy directly to the farmers; Research and extension support through its annual Krishi Mahotsav campaign, Farm credit through agricultural loan payment of Government; Management of large canal irrigation project like Sardar Sarover Project on Narmada which irrigated mostly the districts of South and North Gujarat; Management of ground water irrigation, rain water harvesting schemes and micro-irrigation technologies especially best irrigated in Saurashtra and kachchha region and North Gujarat; Providing 24/7 power supply to farmers through Jyotigram Yojana and better road connectivity both rural and urban Gujarat (Shah et al.; Gulati et al.,2009 and Socio-Economic Review of Gujarat).

2.1 Agricultural Growth of Gujarat and India since 2000

In the year 2001-02, the annual growth rate of Gujarat agricultural was highest at 34.99 percent where as India the growth was just 6.25 percent. In the same way in the year 2003-04 the agriculture growth were 44.43 percent of Gujarat and 9.96 percent of India respectively.

TABLE No. 2.1— PERFORMANCE OF AGRICULTURE SECTOR AT CONSTANT (2004-05) PRICES (RS. IN CRORE)

Year	Agricultural Production (Rs. crore)		Agricultural Growth (Annual Growth in %)	
	GSDP of Gujarat	GDP of India	Gujarat	India
2001-02	21720	554114	34.99	6.25
2002-03	19964	513973	- 8.08	- 7.24
2003-04	28834	565152	44.43	9.96
2004-05	26746	565426	- 7.24	0.05
2005-06	33982	594487	27.05	5.14
2006-07	33616	619190	-1.08	4.16
2007-08	37155	655080	10.53	5.80
2008-09	33920	654118	-8.71	-0.15
2009-10	33544	656975	0.30	0.44
2010-11	41979	700390	17.10	6.61
2001-02 to 2010-2011 (Annual Average Growth)			10.92	3.10

Source : Various Year Socio-Economic Reviews of Gujarat, Department of Economics and Statistics, Gandhinagar; Economic Survey 2011-12, Govt. of India.

The growth rate Gujarat's agriculture during the period 2001-02 to 2010-11 was 10.92 percent which three time of the growth rate of India's agriculture (See Table 2.1).

2.2 Production of Various Crops of Gujarat and India

The data on annual average growth rate of production of crops for the decade 2001-02 to 2010-11 is presented in figure 2.2. In Gujarat all food crop production i.e. total cereals, Wheat, total pulses and non-food crop i.e. total oilseeds, cotton, groundnut and tobacco etc have rapidly increased in the period 2001-02 to 2010-11. As compared to Gujarat, the performance of India is very less or marginal. The total food grains production was 17.90 percent in Gujarat where as in India the total food grains production was only 1.34 percent. Gujarat is basically highest producing in groundnut, tobacco as compared to India since the period 2000. The groundnut has recorded the most impressive upsurge in average growth production which has reached at 224.85 percent where as in India the figure archived very low growth rate of 0.72 percent. Average growth rate of cotton, an important non-food crop, that performance is better in both Gujarat and India due to the introduction of Bt. Cotton (See Figure 2.2).

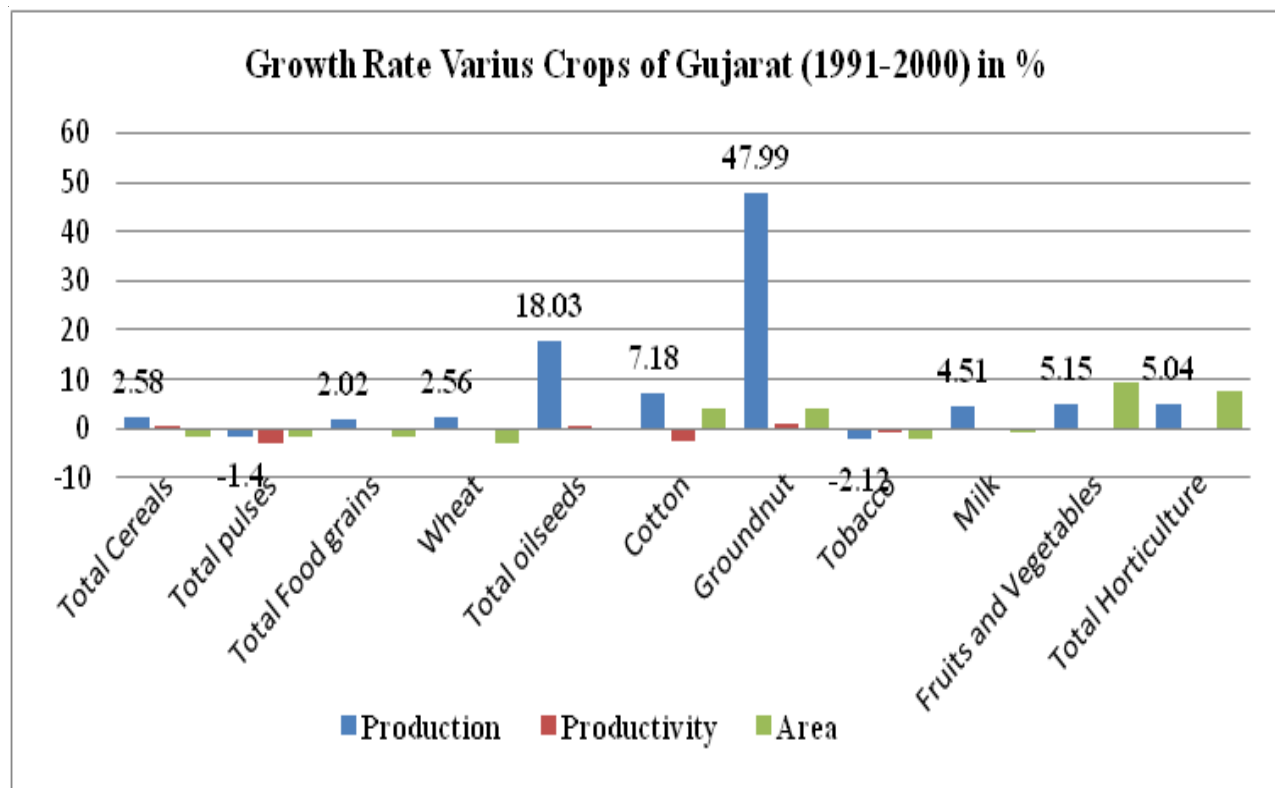
2.3 Productivity of Various Crops of Gujarat and India

Data on changes in the yield per hectare called as productivity in the ten years period are provided in the figure 2.3. During the 10 year period (2001-10) cotton had achieved peak average productivity in both Gujarat and India. The productivity oilseeds is equal both Gujarat and India after 2000's.

2.4 Area coverage of Various Crops of Gujarat and India

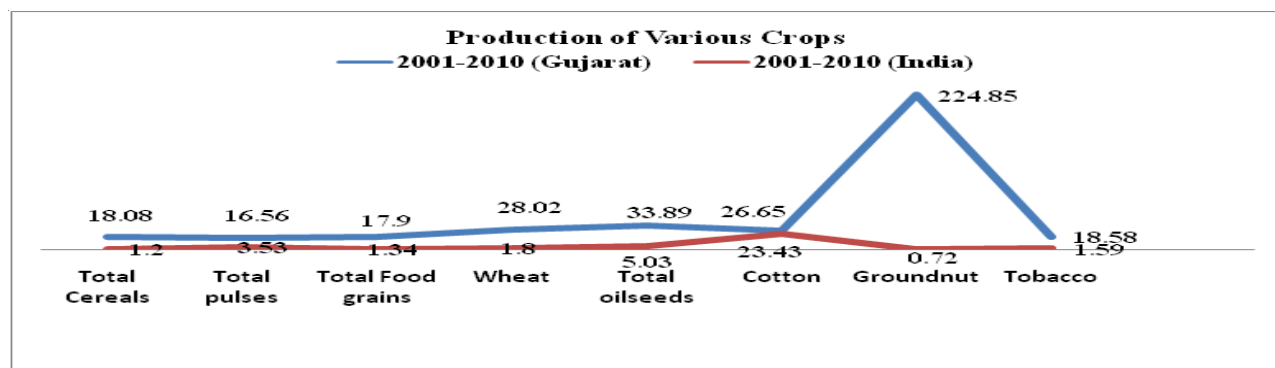
During the period 2001-02 to 2010-11, the growth rate of area of cultivation of cereals, pulses, food grains, wheat, oilseeds, and tobacco has increased highly in Gujarat as compared to India. But the crops like total food grains and groundnut are in negative figure; also total pulses, total oilseeds are also lower area growth than India level (See Figure 2.4). Oilseeds have reduced due to the reduction of crops like castor, sesamum and rapeseed and mustard. The average area under cotton, a major cash crop of Gujarat, has fluctuated over the decades. However, the introduction of Bt. Cotton has led to a significant rise in its area from 15.93 percent in 2000-03 to 20.54 percent in 2005-08. Also it is because the Gujarat farmers have shifted their crop pattern in favour of horticulture crops and non-food commercial crops (Pathak and Shah, 2010).

Figure No. 2.1— Production, Yield & Area of Various Crops in Gujarat (1991-92 to 2001-02)



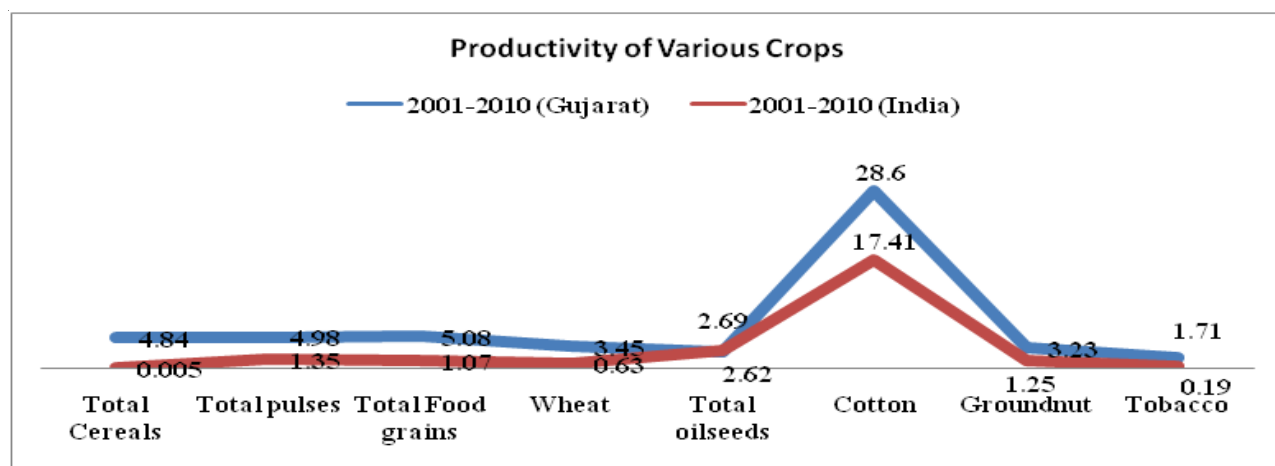
Source: Same as Figure 2.2

Figure No. 2.2—Growth Rate of Production of Various Crops (2001-02 to 2010-11) (Percent)



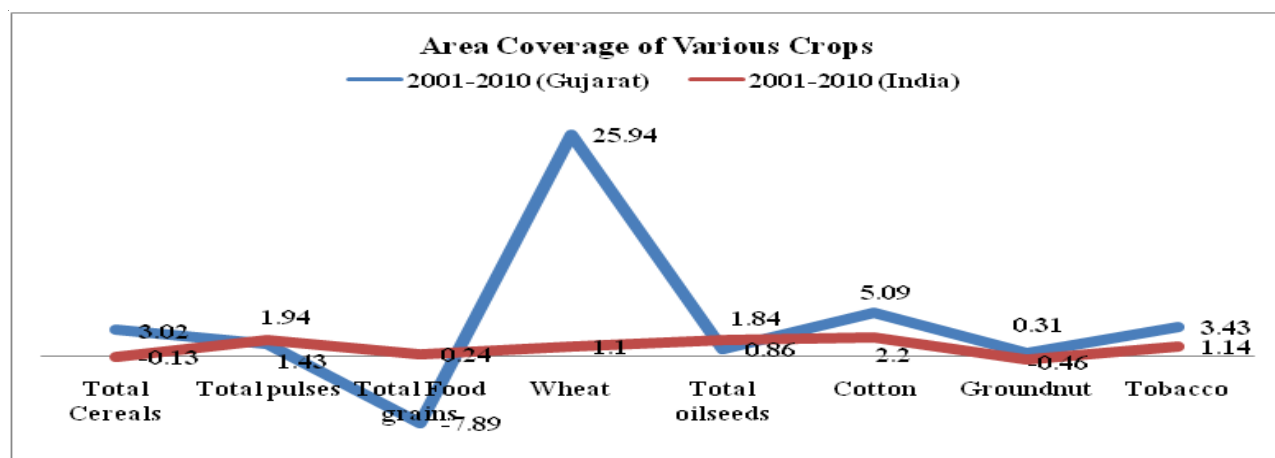
Source: Directorate of Agriculture, Government of Gujarat, Gandhinagar; Agricultural Statistics Report of Ministry of Agriculture, Govt. of India.

Figure 2.3—Growth Rate of Productivity of Various Crops (2001-02 to 2010-11) (percent)



Source: Same as Figure 2.2

Figure 2.4—Growth Rate of Area Coverage of Various Crops (2001-02 to 2010-11) (percent)



Source: Same as Figure 2.4

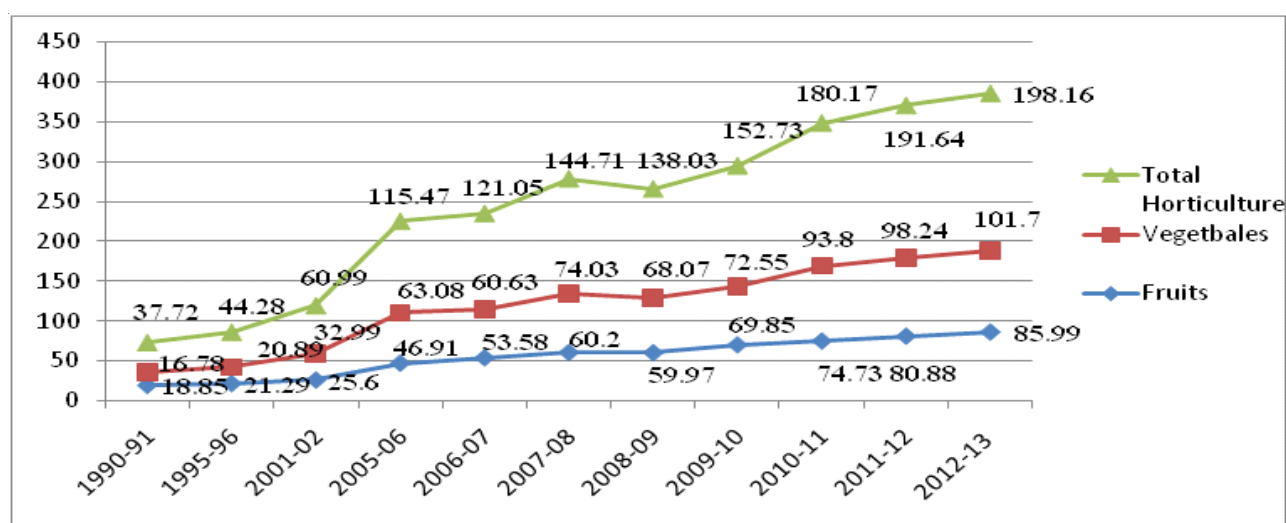
2.5 Production of High Value Crops in Gujarat and India

Diversification of the agricultural production in terms of high value products such as livestock and horticulture is considered a way to enhance agricultural growth and reduce poverty (Birtal et al. 2012). Livestock is expected to play an important role in supplementing the limited income and employment opportunities in crop production sub sector of agriculture, particularly for the small and marginal farmers and land less agriculture labourers. Also the growing horticulture crops is now an ideal option to improve livelihood security, enhance employment generation, attain food and nutritional security, and increase income through value addition (Economic Survey, 2012).

2.5.1 Production of Fruits and Vegetables

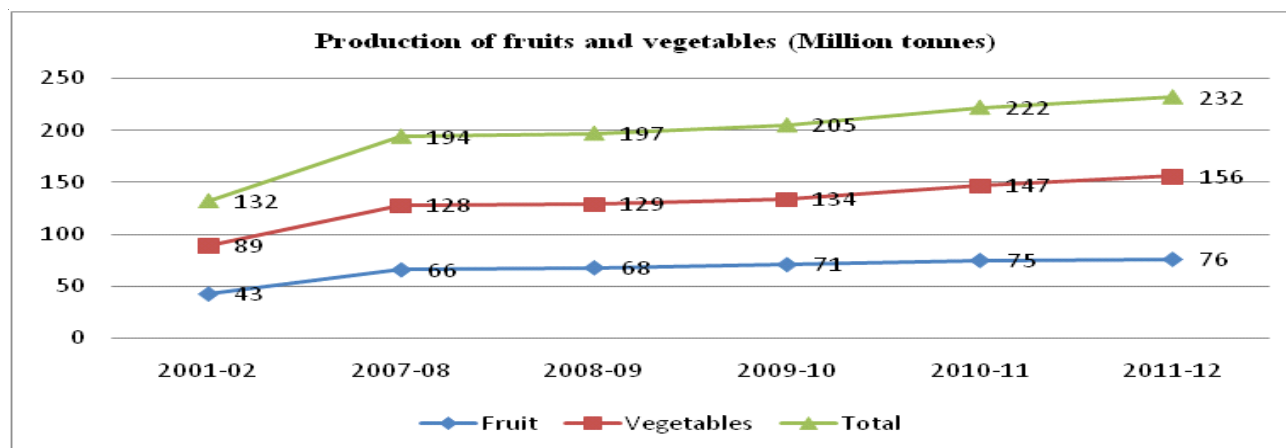
The figure 2.5 and 2.6 have compared the production of horticulture i.e. fruits and vegetables between Gujarat and India. It has found that the production has increased rapidly since 2001-02. In 1990-91 the horticulture production in Gujarat was 37.72 lakh million tones but in 2012-13 has reached to 198.16 lakh million tones which have facilitated through the rapid production of both vegetables & fruits. In the same way India has also achieved success in the production of fruits & vegetables. So it enables to say that both Gujarat and Indian agriculture are going through the right direction from traditional crops pattern to diversified high value crops.

Figure 2.5—Production of Fruits and Vegetables in Gujarat (Lakh Million tones)



Source: Directorate of Horticulture, Gujarat State, Gandhinagar

Figure 2.6—Productions of Fruits and Vegetables in India



Source: Economic Survey 2012-13, Government of India.

2.5.2 Production of Livestock

The table no. 2.2 and 2.3 and figure 2.7 have presented the production of major livestock products viz. milk, eggs, wool and meat in both Gujarat and India from 2000-01 to 2011-12.

TABLE 2.2: PRODUCTION OF MAJOR LIVESTOCK PRODUCTS IN GUJARAT

Year	Milk (Million Tonnes)	Eggs (Lakh eggs)	Wool (Lakh Kg.)
2000-01	53.17	3460	27.4
2005-06	69.6	5775	31.23
2006-07	75.33	7757	29.62
2007-08	79.12	8256	29.96
2008-09	83.87	12675	28.54
2009-10	88.43	12762	29.19
2010-11	93.21	13269	29.18
2011-12	98.17	14269	28.19

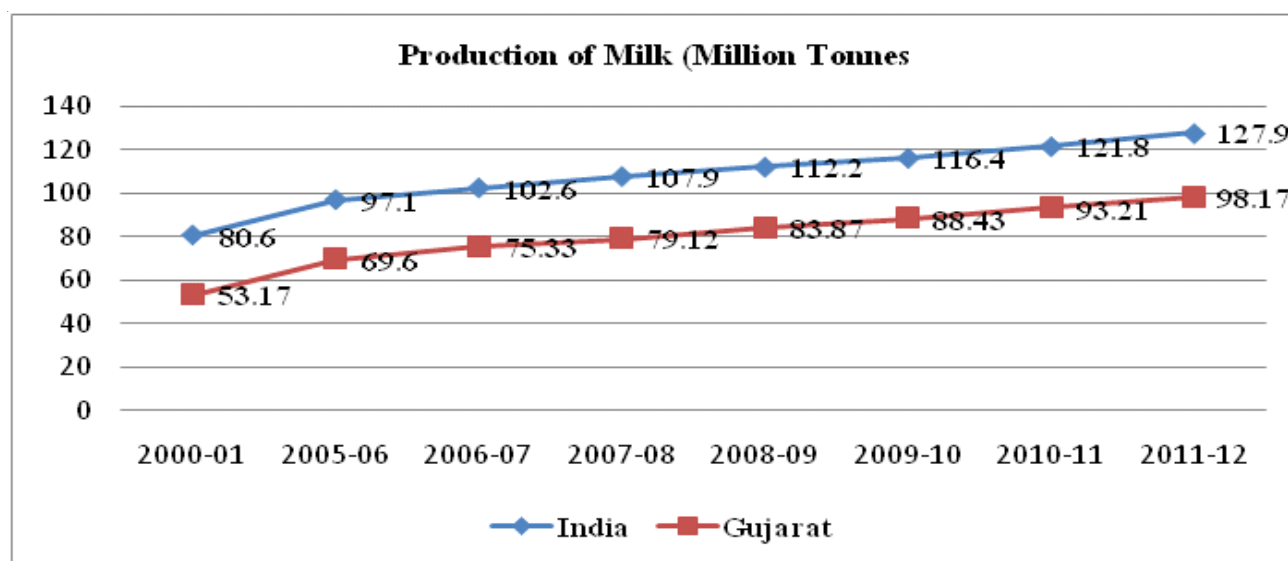
Source : Socio-Economic Review of Gujarat State 2012-13, Gandhinagar.

TABLE 2.3 : PRODUCTION OF MAJOR LIVESTOCK PRODUCTS IN INDIA

Year	Milk (Million Tonnes)	Eggs (Million nos.)	Fish (Thousand Tonnes)
2000-01	80.6	36632	5656
2005-06	97.1	46235	6572
2006-07	102.6	50663	6869
2007-08	107.9	53583	7127
2008-09	112.2	55562	7620
2009-10	116.4	60267	7914
2010-11	121.8	63024	8400
2011-12	127.9	66450	8700

Source : Same as Figure 2.6

Figure 2.7: Productions of Milk of Gujarat and India



Source : Based on Table No. 2.2 and 2.3.

India is the largest milk producer country among the world while Gujarat state has remarkable 5th rank with about 8 percent contribution in total milk production in all over the country in the year 2009-10 (28th livestock Survey report, Gujarat).

In the year 2011-12, the estimated milk production was 98.17 million tones which were only 53.17 million tons in 2000-01. Where as in India, the estimated milk production in 2011-12 was 127.9 million tones and 2000-01 it was only 80.6 million tones. The total egg production (Both Deshi and Improved poultry) in Gujarat state during 2011-12 is estimated as 14269 lakh eggs, showing an increase of 7.53percent over the previous year's production of 13269 lakh eggs. In India, during 2011-12 it is estimated as 66450

million eggs, showing an increase of 5.43percent over the year's production of 63.024 million eggs. In Gujarat the wool production for the year 2011-12 is estimated to 28.19 lakh Kg as compared to 27.01 lakh kg in the year 2000-01. Fish production is estimated as 8700 thousand tones in 2011-12 in India which is 53.81percent increase from the 2000-01 to 2011-12 (See Table 2.2, 2.3 and Figure 2.7).

3. Major Policy and Programmes in the Agricultural Development of Gujarat

Gujarat has proved to be successful in implementing some of these policies and make agriculture growth miracle after 2000. The major policy and programme of vibrant Gujarat are Krishi Mahostav campaign for research and

extension support, Soil health card facilities for soil conservation, Jyotigram Yojana to provide 24/7 electricity, Sardar Sarovar Project for the construction of major and medium canal irrigation, Sujlam Suflam Yojana for interlinking rivers, Management of ground water irrigation under Sardar Patel Sahakari Jal Sanchaya Yojana etc. Other Policies include programme for horticulture development through Gujarat Horticulture mission, improved market access through Agricultural produce marketing committee etc. These policy performances are making Gujarat successful in agriculture and role model for the other states.

3.1 Irrigation Development Programme

Irrigation infrastructure is the most important factor in increasing agriculture production. The Government of Gujarat has established water resources development department which is estimating the irrigation potential and utilization of surface and ground water sources. The sources of irrigation from Surface water are major & medium irrigation canals, under Sujalam Suphalam Yojana, Minor irrigation schemes and indirect benefits through percolation tanks, check dams etc under the Sardar Sarovar project Yojana. The sources of ground water are government tube wells, tanks and other sources including khet talavadi, Boribandh and Checkdam etc. Surface water irrigation potential is 31.31 lakh hectares and maximum utilization is 23.20 lakh hectares; the ground water irrigation potential and maximum utilization are 0.87 lakh hectares and 1.20 lakh hectare respectively till 2011 (Socio-Economic Review, 2011).

3.2 Rural Electrification Programme

Gujarat's agriculture growth miracle has been driven by improved rural power supply under the Jyotigram Scheme. Before this scheme, the mechanization was in bankrupt due to uncontrolled power subsidies to the farmers. To control power subsidies and overcome the debt problem of Gujarat Electricity Board, the Government started initiatives including reduced hours of three phase power connection used by the tube-well owners, providing 24 hours single or double phase power supply for domestic users and provide only single phase connection to the farmer who are using heavy motor-pumps. This decision of Gujarat Electricity Board had turned agriculture and farmer as the main loser customers.

In 2003, the Government of Gujarat implemented the Jyotigram Scheme or known as 'Lighted Village Scheme' through the cooperation of International Water Management institute (IWMI) and its main aim was to provide 24*7 three phase full power supply. But the implementation of this goal was depended on effective rationing system and imposed on those who are using illegal power consumption. Now this scheme is providing three phases full voltage power supply for agriculture and farmers among 18000 odd villages across Gujarat at the consistent time and scheduled (Gulati et al, 2009).

3.3 Krushi Mahostav Campaign Programme

It is a flagship programme which was started in 2005 in Gujarat. Krushi Mahostav is a programme of creating awareness among farmers through providing information on farming. The main objective is expansion of research, extension and technical support to the farmers and is called lab to land programme that gives knowledge to the farmers. In this programme large number of agriculture officers, researchers and scientists are engaged and they visit every village in the districts of Gujarat with 'Krushi Rath'. It provides information on soil conservation through soil health card scheme, Water conservation through community based irrigation which is called as water harvesting, Organic farming etc (Socio-economic review of Gujarat and Department of Agriculture).

3.4 National Horticulture Mission

Gujarat is occupying 4th, 6th and 3rd places in India in production of fruits, Vegetables and spices respectively. In other wards horticulture crops are high value crops and demand of these crops is now increasing in the world market. This type of crop plantation will bring inclusive agriculture development. So the Government of Gujarat has implemented Nation Horticulture Mission from the year 2005-06 with a view to double the horticulture production and income of the rural poor (Socio-Economic Review of Gujarat).

Various programmes by the state Government are going on to boost the horticulture. The programme for horticulture development are Gujarat Horticulture Mission, Women Empowerment, upliftment of poor farmers, Input Subsidy for Horticulture, Establishment and strengthening nursery, Extension Activity, Exhibition and Competition of Horticulture crops and Financial Assistance etc (Report on horticulture in Gujarat, 2009). These programmes help to reduce rural poverty by increasing and also stabilize farmer's income and bring inclusive agriculture development in Gujarat. The research and development work of horticulture crops are conducted in four agriculture universities situated at Anand, Junagadh, Dantivada and Navasari that have aim to solve farmers problem in the field of horticulture.

3.5 Improved Agricultural Marketing

The agricultural marketing is important component for inclusive agriculture development to deliver agricultural products directly from the farmers to the consumers. India agricultural marketing is being promoted through Agricultural Price Monitoring Committee (APMC Act). Gujarat is one of the leading states that have implemented this APMC Act since 2003 (Economic survey of India, 2012). There are different stages of reforms have been taking place in the APMC Act through Direct marketing, Contract farming and markets in private or cooperative sectors since 2007 in Gujarat (Gulati et al, 2009). These

reforms are helping farmers to directly sell their produce to wholesalers and exporters with a good profit margin and the government of Gujarat has also encouraged policies to promote sale of diversified high value crops (Shah et al, 2009).

4. Major Policy and Programmes in the Agricultural Development of India

The major schemes and programmes which have been implemented recently by the central government to boost the agricultural growth in the rural areas are discussed in below. All discussion relating to agricultural policies and programme has obtained from the economic survey of government of India.

4.1 National Mission for Sustainable Agriculture

The national mission for sustainable agriculture is one of the eight missions under the Nation Action Plan on Climate Change (NAPCC). It seeks to address issues regarding 'sustainable agriculture' in the context of risks associated with climate change by devising appropriate adaption and mitigation strategies for ensuring food security, enhancing livelihood opportunities and contributing to economic stability at national level. The mission promotes dry land agriculture; mission would expand its coverage to rain fed areas for integrating farming systems with live stock and fisheries, so that agriculture continues to grow in a sustainable manner.

4.2 Macro Management of Agriculture

The Macro Management of Agriculture (MMA) scheme is initiated for agricultural production, productivity and it provides opportunities relating to crop production and natural resources management. The MMA scheme has formula based allocation criteria and provides assistance in the form of grants to the states/UTs (Union Territories) on 90:10 basis except in case of the north-eastern states and Union Territories where the central share is 100 per cent. MMA assistance during 2010-11 has been used to treat 3.02 lakh hectare of land under the National Watershed Development Project for Rainfed Areas (NWDPA) and 1.94 lakh hectare under River Valley Projects (RVP).

4.3 National Food Security Mission

The NFSM was launched in 2007-08 with a view to enhancing the production of rice, wheat, and pulses by 10 million tons, 8 million tons, and 2 million tons respectively by the end of the Eleventh Plan. The Mission aims to increase production through area expansion and productivity; create employment opportunities; and enhance the farm-level economy to restore confidence of farmers. The NFSM is presently being implemented in 476 identified districts of 17 States of the country.

4.4 The Rashtriya Krishi Vikash Yojana (RKVY)

The RKVY was launched in 2007-08 with an outlay of Rs.25,000 crores for the Eleventh Plan to incentivize states to enhance public investment so as to achieve a 4 percent growth rate in agriculture and allied sectors during the Plan. During the three year period 2007-10, an amount of Rs. 7895.12 crores was released under the RKVY. Out of the budget provision of Rs. 6722 crore for implementation of the RKVY in the states, an amount of Rs. 3986.76 crore has been released as on 25 November 2010.

Specific allocation has to be made for the following three new initiatives introduced under the in 2010 -11. **First**, Rashtriya Krishi Vikash Yojana Extended the Green Revolution to the eastern region of the country, covering the States of Assam, Bihar, Chhattisgarh, Jharkhand, Orissa, eastern UP, and West Bengal, with the objective of increasing the crop productivity of the region by intensive cultivation through recommended agricultural technologies and package of practices. **Second**, special initiatives for pulses and oilseeds in dry-land areas by organizing 60,000 pulses and oilseeds villages in identified watersheds where pulse and oilseed farmers are provided farm machinery and equipment on custom hiring basis. These initiatives dovetail with other schemes of the Government of India having components for promotion of oilseeds and pulses production. **Third**, implementation of the National Mission on Saffron for Economic Revival of Jammu & Kashmir Saffron Sector during 2010-11.

4.5 The Integrated Scheme of Oilseeds, Pulses, Oil Palm and Maize (IPOPOM)

The ISOPM is being implemented in 14 major states for oilseeds and pulses, 15 for maize, and 10 for oil palm. The pulses component has been merged with the NFSM with effect from 1 April 2010. The Scheme provides flexibility to the States in implementation based on a regionally differentiated approach to promoting crop diversification. Under the Scheme, assistance is provided for purchase of breeder seed, production of foundation seed, production and distribution of certified seed, distribution of seed minikits, plant protection chemicals, and plant protection equipment. The Oil Palm Development Programme under the ISOPOM is being implemented in the States of Andhra Pradesh, Karnataka, Tamil Nadu, Gujarat, Goa, Orissa, Kerala, Tripura, Assam, and Mizoram. Its Maize Development Programme is under implementation in 15 States, viz. Andhra Pradesh, Bihar, Chhattisgarh, Himachal Pradesh, Jammu and Kashmir, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, and West Bengal.

From the above analysis, there has lot of new scheme and programme built for the solution of agricultural deficit and achieves four percent GDP growth in agriculture. But the performance of this new programme is not so good

which is known by the current agriculture production and productivity. For the better implementation and ensured optimum results from the ongoing agriculture and allied sector programme, there should be better implementation of public private partnership programme and further effective coordination and monitoring is required in the agriculture and allied programme.

5. Conclusion

The analysis of the status agricultural development from the year 2001-02 to 2010-11, the study has found some positive result in agricultural growth of output in Gujarat. It has achieved high level of production and productivity in the various crops i.e. wheat, total pulses, total food grains, total oilseeds, groundnut and tobacco which are very much higher than India's performance. In terms of high value crops i.e. production of fruits, vegetables and milk both India and Gujarat has facilitated diversification in order to give backup to the farmers at the time of lean season or crop failure for supplementing their incomes. Though the performance of both crop and non-crops have increased rapidly than India and this will increase income of the rural people and massive expansion of area and production of livestock product and horticulture product brings inclusive growth in agriculture.

This type of achievement in crops production (food and non-food crops) have facilitated by the innovating agricultural and rural development policies and programmes of the both state and central government. Gujarat has been successfully implementing all the policies relating to irrigation, rural electrification (Jyotigram Scheme), farmer awareness (Krushi Mahostav research & extension programme) etc. The performance of the above schemes or programmes needs to further analysis across district wise and their impact on agricultural status of the concerned area or region. India has too executed some of the programmes in order to boost agricultural production and achieved targeted 4 percent growth rate. But the performance of this new programme is not so good which is known by the current agriculture production and productivity.

For the better implementation and ensured optimum results from the ongoing agriculture and allied sector programme, there should be better implementation of public private partnership programme and require proper communication channel among the various stakeholder as well as government department in both state as well as central level.

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Cost and Return Analysis of Mandarin Orange-a case Study in Darjeeling District of West Bengal

SUDHAKAR LAMA* AND S.C. SARKER**

Abstract

Orange cultivation is highly intensive and skilled type of cultivation of crop and therefore well suited to small and marginal holding growers who have very small holding, it needs optimum temperature, shade adequate support, nutrient for growth and large quantity of water. As the water requirement of the crop is high, it requires assured source of water supply and for this reason its cultivation is localized in place where water is easily available. Orange is cultivated in about 930 hectare of land in Darjeeling District. The study area of selected block viz, Kalimpong block 1, Takdah block and Bijanbari block had 99.95, 209.30, 119.44 hectares area respectively under Orange cultivation in the district during 2009-10. However the large scale cultivation of Orange is concentrated mainly in these selected blocks, hence Kalimpong block, Takdah block and Bijanbari block was purposively selected for this study as it has larger area under Orange cultivation. As we know that the ultimate objective of the production is to fetch remunerative prices by the growers of their products. The present study has made an attempt to estimate the cost and return analysis of Mandarin Orange. The result revealed that no significant relationship is noticeable between the age of an orchard and total operational cost involved in Mandarin Orange garden in the studied areas. Cost and return analysis of Mandarin Orange as a whole in the selected blocks of Darjeeling District showed that higher net income Rs. 102493 were received by the growers in Takdah block due to higher productivity (67030 fruits per hectare) and higher selling price. On the other hand lower net income Rs. 24668 received by the growers in Kalimpong block due to their lower productivity (44341 fruits per hectare). From the above point we may conclude that cultivation of Mandarin Orange is still a profitable enterprise in Darjeeling District.

Introduction

Agriculture has an important role in Indian economy. Agriculture sector provides livelihood for 60% to 70% of the total population in India. The sector also provides employment to 54% of the country's work and it is the single largest private sector which provides occupation

to the people of the country. India has also attained important place in the field of horticulture and emerged as a leading horticultural country of the world with a total annual production of 224 million tonnes of horticultural crops during 2009-10 covering an area of 8% in crop production it contributes 24.5% to the GDP, and 54.55% to export earning in agriculture sector. Horticulture, which has gained commercial dimension in the recent years, is an important component of agriculture, having very significant share in the economy of the country. Horticulture also provides better alternative for diversification of Indian agriculture in view of higher return. It plays an important role in country's nutritional security as well, including poverty alleviation and employment generation. The horticultural scenario of the country has been changing fast, both in terms of production and productivity. The focused attention and high priority accorded to the development of horticulture in the country has led to increase in production and productivity and opened new vistas for export of fresh and processed horticulture products (Anonyms, 2010).

Citrus industry in India is the third largest fruit industry of the country after mango and banana. Orange (*Citrus reticulata* Blanco) is most common among citrus fruits in India and occupies nearly forty percent of the total area under citrus cultivation. Besides, fresh fruits and a much valued food preservative, orange has earned the fame of transnational delicacy having been in strong demand around the year throughout the world. The strong demand for oranges on both national and international level has been attributed to the appreciation of its nutritional importance and as a rich source of vitamins C. In India, citrus is grown in 0.62 million hectares area with the total production of 4.79 million tones and most important commercial citrus species in India are mandarin Orange (*Citrus reticulata*), sweet orange (*Citrus sinensis*) and acid lime (*Citrus aurantifolia*) sharing 41, 23 and 23 % respectively of all citrus fruits produced in the country.

Land is one of the most important natural resource in the hills of Darjeeling and its rational use assumes the utmost significance for the economic upliftment of the rural masses. The only choice open to the hill farmers is to

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exploit the advantage of climatic conditions by growing deep rooted high value crops to increase farm income. Mandarin cultivation has been considered as the best potential alternative to harness the benefits from optimum allocation of available resources. The hill region has been facing environmental degradation partly due to increasing population pressure coupled with expansion of agricultural land use and overgrazing. Integration of high value fruit trees such as citrus into traditional farming systems could be viewed as an option for improvement of livelihood of small farmers together with conservation of natural resources. With improvement in access to urban market, commercial production of mandarin orange has emerged in some regions after 1970s. An attempt has been made to bring out the impacts of adoption of commercial orange production in traditional upland farming systems, with particular reference to rural employment and income.

Methodology :

A multistage sampling technique was adopted for selection of district, block, village, mandarin growers and selection of market and market functionaries. Darjeeling district was purposively selected as first strata. Among the blocks Kalimpong block I, Takdah block and Bijandari block was purposively selected on the basis of maximum area under Mandarin Orange. From these blocks 10 villages was selected and 60 respondent farmers were selected. For evaluating the marketing cost, marketing margin and price spread in Orange marketing, 20 wholesalers, 10 retailers, 10 traders and 10 local brokers/contractors was selected purposively. The said study was entirely based

on both primary and secondary data. Primary data was collected through direct interview method using pre designed survey schedules from the selected farmer and to the different market functionaries. Well- constructed and pre-tested questionnaire and schedules were also used to collect data on marketing. For the collection of data personal interviews were arranged and reconnaissance study were also conducted to collect the data regarding market cost, price received and price paid (price spread) etc, from growers of different market functionaries. Further the required secondary data to supplement the primary data and to support the study were mainly collected from published sources of State Govt. like -Block development office Darjeeling Sadar, Department of Agricultural Marketing and directorate of Economics and Statistics, National Horticulture Board (NHB) Website of different Organizations and Institutions were used. The study is related to the agriculture year 2010-11. To fulfil the specific objectives of the study tabular and Statistical analysis were used whenever needed.

Results and Discussion :

Cost is an Important factor for determining the gross income of the farmers. It a general preposition that lowers the cost, higher will be the net income of the growers. For lack of time and having the long technical life of the Mandarin Orange we are not able to collect the accurate information of fixed cost of Mandarin Orange growers. As a result we are calculating only the paid out cost of the growers for finding out the gross income of the growers.

TABLE 1—AGE-WISE DISTRIBUTIONS OF OPERATIONAL COST OF ORANGE ORCHARD IN KALIMPONG BLOCK 1

Age of an Orchard (Yrs)	No. of Orchard	Average size (hac)	Item of the cost (in Rs./hac)						
			PM	Labour	FYM	NC	I.P.	IRG	TOC
Less than 20	08	0.80	2235 (26.3)	2272 (26.7)	1790 (21.1)	—	469 (5.5)	1729 (20.4)	8496 (100)
20–30	05	1.06	2430 (28.2)	2618 (30.3)	1869.79 (21.7)	—	385 (4.6)	1309 (15.2)	8613 (100)
30–40	08	1.07	1731 (21.0)	2433 (29.5)	1709.24 (20.7)	—	481 (5.9)	1877 (22.9)	8232 (100)
Above 40	09	0.79	2510 (25.0)	2840 (28.4)	2178 (21.8)	—	434 (4.5)	2025 (20.3)	9988 (100)

Source : Field Data. Note : PM-Planting Materials, FYM-Farm Yard Manure, NC-Neem Cake, I.P.-Insecticide and Pesticide, IRG-Irrigation, and TOC-Total Operation Cost.

Figure in parenthesis indicate the percentage of respective totals.

Table 1 presents the age wise distribution of operational cost of Mandarin Orange in Kalimpong block 1. The Table shows that higher the age of an orchard, higher will be the operational cost of the Mandarin Orange growers

which is quite natural. The reason may be cited here is that higher age group of the Mandarin Orange growers incurred more cost for maintaining their gardens in fruiting stage.

TABLE 2—AGE-WISE DISTRIBUTIONS OF OPERATIONAL COST OF ORANGE ORCHARD IN TAKHDA BLOCK

Age of an Orchard (Yrs)	No. of Orchard	Average size (hac)	Item of the cost (in Rs./hac)						
			PM	Labour	FYM	NC	I.P.	IRG	TOC
Less than 20	02	0.80	—	2593 (30.0)	1852 (21.5)	2038 (23.6)	680 (7.8)	1482 (17.1)	8645 (100)
20–30	02	0.54	—	4609 (37.9)	2378 (19.6)	2213 (18.2)	1099 (9.1)	1852 (15.2)	12152 (100)
30–40	05	1.10	990 (8.5)	3836 (33.1)	2089 (18.1)	2300 (19.9)	963 (8.3)	1408 (12.1)	11587 (100)
Above 40	06	1.61	926 (7.2)	3878 (30.2)	2223 (17.3)	2828 (21.9)	1432 (11.2)	1568 (12.2)	12856 (100)

Source : Field Data. Note : PM-Planting Materials, FYM-Farm Yard Manure, NC-Neem Cake, I.P.-Insecticide and Pesticide, IRG-Irrigation, and TOC-Total Operation Cost.

Figure in parenthesis indicate the percentage of respective totals.

Age wise distribution of Mandarin Orange in Takdah block is furnished in table 2. The Table found that there is no significant relationship between the age of an orchard and the total operational cost involved in the Mandarin Orange gardens. However one finding has been emerged is that higher the age, higher will be the operational cost

which is also corroborated in Kalimpong block 1. Item wise analysis of the cost revealed that labour cost is the most significant one as maintenance of Mandarin Orange under different operations are particularly done by the woman folks.

TABLE 3—AGE-WISE DISTRIBUTIONS OF OPERATIONAL COST OF ORANGE ORCHARD IN BIJANBARI BLOCK

Age of an Orchard (Yrs)	No. of Orchard	Average size (hac)	Item of the cost (in Rs./hac)						
			PM	Labour	FYM	NC	I.P.	IRG	TOC
Less than 20	02	0.68	1175 (14.2)	2124 (25.6)	2060 (24.9)	—	815 (9.8)	2116 (25.5)	8291 (100)
20–30	03	0.63	—	2581 (34.3)	2341 (31.2)	—	938 (12.4)	1655 (22.1)	7516 (100)
30–40	03	0.80	—	2045 (34.1)	1830 (30.5)	—	785 (13.1)	1341 (22.3)	6002 (100)
Above 40	04	0.35	1766 (19.1)	2680 (28.9)	2643 (28.5)	—	1003 (10.9)	2926 (31.6)	9252 (100)

Source : Field Data, Note : PM-Planting Materials, FYM-Farm Yard Manure, NC-Neem Cake, I.P.-Insecticide and Pesticide, IRG-Irrigation, and TOC-Total Operation Cost.

Figure in parenthesis indicate the percentage of respective totals.

Table 3 presents the age wise distribution of Mandarin Orange in Bijanbari block. The table revealed that no significant relationship can be drawn between the

age of an orchard and total operational cost involved in maintaining. the Mandarin Orchard garden, the same findings also found out from the block of Kalimpong and Bijanbari.

TABLE 4—AGE-WISE DISTRIBUTIONS OF OPERATIONAL COST OF ORANGE ORCHARD—OVERALL

Age of an Orchard (Yrs)	No. of Orchard	Average size (hac)	Item of the cost (in Rs./hac)						
			PM	Labour	FYM	NC	I.P.	IRG	TOC
Less than 20	15	0.76	1136 (13.4)	2331 (27.5)	1902 (22.5)	679 (8.1)	654 (9.6)	1776 (20.9)	8477 (100)
20–30	10	0.86	810 (8.6)	3270 (34.6)	2198 (23.3)	741 (7.8)	808 (8.6)	1605 (17.1)	9425 (100)
30–40	16	1.02	909 (10.6)	2771 (32.2)	1877 (21.8)	765 (8.9)	743 (8.6)	1543 (17.9)	8608 (100)
Above 40	19	0.96	1734 (16.2)	3137 (29.2)	2346 (21.8)	938 (8.7)	958 (8.8)	2173 (20.3)	10700 (100)

Source : Field Data, Note : PM-Planting Materials, FYM-Farm Yard Manure, NC-Neem Cake, I.P.-Insecticide and Pesticide, IRG-Irrigation, and TOC-Total Operation Cost.

Figure in parenthesis indicate the percentage of respective totals.

Age wise distribution of operational cost of Mandarin Orange as a whole focuses in table 4. The Table shows that no significant relationship is noticeable between the age of an orchard and total operational cost involved in Mandarin Orange garden in the studied areas. Further the table signifies that labour cost incurred in significant portion of the total operation cost followed by the farm yard manure. From the table we may conclude that higher the age of an orchard, higher will be the total operational cost as because maintenance cost will be

higher particularly intercultural operations, which is usually done by the female labours, due to the migration of male one to get higher wages in other parts of the country.

Cost and return analysis of any enterprise is one of the vital tasks of the research. Hence in this chapter we are interested to calculate the cost of the Mandarin Orange and also to find out the return for assessing the profitability of the Mandarin Orange in the studied areas of related block of Darjeeling District.

TABLE 5—COST AND RETURN ANALYSIS OF MANDARIN ORANGE IN KALIMPONG BLOCK 1

Age of an Orchard (Yrs.)	Selling Price (Rs./1000 Fruit)	Operational Cost (Rs./hac)	Productivity (No. of fruit/hac)	Gross Income (Rs./hac)	Net Income (Rs./hac)
1	2	3	4	5	(Col 5–Col 3)
Less than 20	2000	8497	33505	68710	35204
20–30	2250	8612	61107	72860	11750
30–40	2125	8232	44460	75238	30781
Above 40	2000	9988	38285	59223	20935
Average	2094	8832	44341	69007	24667

Source : Field Data.

Table 5 shows the cost and return analysis of Mandarin Orange in Kalimpong block 1. The Table examines that there is no relationship between age of the orchards and the net income accrued by the Mandarin Orange growers. But it is to be noted here that net income is lowest in the age group of 40 and above years (Rs.20935)

and the highest in the age group of 30 to 40 years (Rs. 30781), which may be due to the lower maintenance cost of the Mandarin Orange garden and also remunerative prices received by this category of farmers by selling their Mandarin Orchards.

TABLE 6—COST AND RETURN ANALYSIS OF MANDARIN ORANGE IN TAKHDA BLOCK

Age of an Orchard (Yrs.)	Selling Price (Rs./1000 Fruit)	Operational Cost (Rs./hac)	Productivity (No. of fruit/hac)	Gross Income (Rs./hac)	Net Income (Rs./hac)
1	2	3	4	5	(Col. 5-Col 3)
Less than 20	2125	8645	49400	93860	85215
20-30	2750	12152	85215	179900	167748
30-40	2500	11586	74841	97752	86166
Above 40	2625	12856	58662	83693	70837
Average	2500	11310	67030	113800	102493

Source : Field Data.

Cost and return analysis of Mandarin Orange in Takdah block is delineated in Table 6. The table reveals that higher net income (Rs.167748) accrued by the growers in the age group between 20 to 30 years due to the higher productivity of fruits and also the good remunerative prices received by this category of farmers. The table also indicate

that lowest net income (Rs.70837) received by the growers in the age group of 40 and above years due to the higher operational cost involved in Maintaining their gardens. On the other hand lowest net income (Rs.85215) received by the growers in the age group of less than 20 years due to there productivity of Mandarin Orange is also lower.

TABLE 7—COST AND RETURN ANALYSIS OF MANDARIN ORANGE IN BIJANBARI BLOCK

Age of an Orchard (Yrs.)	Selling Price (Rs./1000 Fruit)	Operational Cost (Rs./hac)	Productivity (No. of fruit/hac)	Gross Income (Rs./hac)	Net Income (Rs./hac)
1	2	3	4	5	(Col. 5-Col 3)
Less than 20	1750	8292	14560	32877	29520
20-30	2000	7516	22500	33387	30344
30-40	2250	6002	28750	59482	57052
Above 40	2250	9252	25600	47860	44115
Average	2062	7765	22852	43401	40258

Source : Field Data.

Cost and return analysis of Mandarin Orange in Bijanbari block is delineated in Table 7. The table reveals that higher net income (Rs.57052) accrued by the growers in the age group between 30 to 40 years due to the higher productivity of fruits and also the good remunerative prices

received by this category of growers. The table also indicates that lowest net income received by the growers in the age group of 40 and above years due to the higher operational cost involved in maintaining their gardens.

TABLE 8—COST AND RETURN ANALYSIS OF MANDARIN ORANGE-OVERALL

Blocks	Selling Price (Rs./1000 Fruit)	Operational Cost (Rs./hac)	Productivity (No. of fruit/hac)	Gross Income (Rs./hac)	Net Income (Rs./hac)
1	2	3	4	5	(Col. 5-Col 3)
Kalimpong Block 1	2094	8832	44341	69006	24668
Takdah Block	2500	11310	67030	113800	102493
Bijanbari Block	2062	7765	56444	107200	99437
Total	2218	9302	55940	96668	75532

Source : Field Data.

Cost and return analysis of Mandarin Orange as a whole in the selected blocks of Darjeeling District is delineated in Table 8. A comparative analysis of the cost and return among different blocks revealed that higher net income Rs. 102493 received by the growers in Takdah block due to higher productivity (67030 fruits per hectare) and higher selling price. On the other hand lower net income Rs. 24668 received by the growers in Kalimpong block 1 due to their lower productivity (44341 fruits per hectare). On the other hand overall net income (Rs. 75532) received by the growers and the average productivity is (55940 fruits per hectare). From the above Table we may conclude that cultivation of Mandarin Orange is still a profitable enterprise in Darjeeling District though there are some inheriting problems for cultivation of this fruit in this region.

TABLE 9—PROFITABILITY RATIO OF MANDARIN GROWER IN KALIMPONG BLOCK 1 : (PER HECTARE)

Sr. No.	Particulars	Value
1.	Total (Rs.)	8832
2.	Gross Return (Rs.)	69006
3.	Net Profit (Rs.)	24668
4.	Capital Investment	23750
5.	Ratio of Expenses to Sales (S.N1/S.N2)	0.12
6.	Ratio of Net Profit to Sale (S. N3/S. N2)	0.36
7.	Ratio of Net Profit to Capital Employed (S. N3/S. N4)	1.04
8.	Capital Output Ratio (S. N4/S. N2)	0.33
9.	Maintenance Cost as % to Gross Value of Production (S. N1/S. N2 × 100)	12.08

Source : Field Data.

Table 9 presents profitability ratio of Mandarin Orange in Kalimpong block 1. From the table it shows that ratio of net profit to capital employed by the Mandarin Orange growers in Kalimpong block 1 is 1.06, which is very significant one on the part of the growers.

TABLE 10—PROFITABILITY RATIO OF MANDARIN GROWER IN TAKHDA BLOCK 1 : (PER HECTARE)

Sr. No.	Particulars	Value
1.	Total (Rs.)	11310
2.	Gross Return (Rs.)	113800
3.	Net Profit (Rs.)	102493
4.	Capital Investment	29000
5.	Ratio of Expenses to Sales (S.N1/S.N2)	0.10
6.	Ratio of Net Profit to Sale (S. N3/S. N2)	0.90
7.	Ratio of Net Profit to Capital Employed (S. N3/S. N4)	3.53
8.	Capital Output Ratio (S. N4/S. N2)	0.25
9.	Maintenance Cost as % to Gross Value of Production (S. N1/S. N2 × 100)	10.0

Source : Field Data.

Profitability ratio of Mandarin Orange in Takdah block is furnished in Table 10. The table shows that ratio of net profit to capital employed by the Mandarin Orange growers is 3.58, higher as compared to Kalimpong block I. The table also shows that ratio of capital output is 0.25 which indicates significant one on the part of the growers.

TABLE 11—PROFITABILITY RATIO OF MANDARIN GROWER IN BIJANBARI BLOCK : (PER HECTARE)

Sr. No.	Particulars	Value
1.	Total (Rs.)	7765
2.	Gross Return (Rs.)	107200
3.	Net Profit (Rs.)	99437
4.	Capital Investment	24075
5.	Ratio of Expenses to Sales (S.N1/S.N2)	0.08
6.	Ratio of Net Profit to Sale (S. N3/S. N2)	0.93
7.	Ratio of Net Profit to Capital Employed (S. N3/S. N4)	4.13
8.	Capital Output Ratio (S. N4/S. N2)	0.22
9.	Maintenance Cost as % to Gross Value of Production (S. N1/S. N2 × 100)	7.25

Source : Field Data.

Profitability ratio of Mandarin Orange in Bijanbari block is furnished in Table 11. The table shows that ratio of net profit to capital employed by the Mandarin Orange growers is 4.18, higher as compared to Kalimpong block 1 and Takdah block. The table also shows that ratio of capital output is 0.22 which indicates significant one on the part of the growers.

TABLE 12—PROFITABILITY RATIO OF MANDARIN GROWER-OVERALL : (PER HECTARE)

Sr. No.	Particulars	Value
1.	Total (Rs.)	9302
2.	Gross Return (Rs.)	96668
3.	Net Profit (Rs.)	75532
4.	Capital Investment	25525
5.	Ratio of Expenses to Sales (S.N1/S.N2)	0.10
6.	Ratio of Net Profit to Sale (S. N3/S. N2)	0.73
7.	Ratio of Net Profit to Capital Employed (S. N3/S. N4)	2.96
8.	Capital Output Ratio (S. N4/S. N2)	0.26
9.	Maintenance Cost as % to Gross Value of Production (S. N1/S. N2 × 100)	9.77

Source : Field Data.

The overall profitability ratio of Mandarin Orange in the selected block in our study areas is delineated in Table 12. The table showed that the ratio of net profit to capital employed is 2.94 which is very astonishing findings from the point of capital investment in the Mandarin Orange gardens. From the said table it reveals that net profit is also (Rs.75532) very significant one and capital investment (25525per hectare) made by the growers in the Mandarin Orange gardens which is not so high particularly those group of growers whose occupation are mainly cultivation cum business and cultivation cum service.

Conclusion

Age wise distribution of the orange growers in our selected orchards owner revealed that there is no relation between age of the orchard and the productivity of Mandarin Orange. The overall picture in our studied areas indicated that lower the age, lower will be the productivity of Mandarin orange but there is a significant relationship between the age of an orchard and number of trees planted in the gardens.

One important finding have been emerged during my investigation that growers having the higher age

group, mortality of the existing trees in the garden may also be higher due to fatal diseases and attacked by insect and pests.

Cost and return analysis of Mandarin Orange as a whole in the selected blocks of Darjeeling District revealed that higher net income is received by the growers of Takdah block due to higher productivity and higher selling price of their products. From the above findings we may conclude that cultivation of mandarin Orange is a profitable enterprise in Darjeeling District.

The profitability ratio of Mandarin Orange in the selected block in our study areas examines that the ratio of net profit to capital employed is 2.94 which is very astonishing findings from the point of capital investment in the Mandarin Orange gardens.

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AGRICULTURAL PRICES IN INDIA

It is an old adage that Agricultural prices mirror the economy of a country. It is more true in the case of an agricultural country like India. Viewed from this angle, it is quite an important publication. It gives information on index numbers, farm (Harvest) prices, wholesale and retail prices of various agricultural commodities, etc.

C. Agro-Economic Research

Spread of new varieties of Hybrid Rice and their Impact on the overall production and Productivity in Madhya Pradesh

Rice is the most important cereal crop in India in terms of area occupied, production and consumption as a principal food and occupies a prominent place in Indian agriculture. India produces 98.09 million tonnes of rice (2009-10). It is cultivated over an area of 41.92 million hectares which account for 23.25 per cent of the gross cropped area and 37.08 per cent of the area sown to that food-grain. It is the staple food for more than 60 per cent of Indian population and it accounts for 43 per cent of total food grain production and 46 per cent of total cereal production. To meet out the demand of increasing population and to maintain food self-sufficiency, the present production level of 99.18 million tons needs to be increased up to 120 million tons by the year 2020. This increase in production has to be achieved in the backdrop of declining and deteriorating resources such as land, water, labour and other inputs and without adversely affecting the environment. The erratic monsoon pattern like the one witnessed during 2009 puts additional pressure to fill the food grain deficit (Viraktamath et al., 2010).

Over the last four decades, the country witnessed an impressive growth in rice production due to the adoption of semi dwarf high yielding varieties coupled with the adoption of intensive input based management practices. However, in recent years the growth in production has decelerated from 4 per cent during 1980s' to 1.7 per cent during 1990s'. This deceleration is largely on account of slowing down in the growth of yield from 3.6 per cent during the 1980s to 1.3 per cent during the 1990s. Plateauing trend in the yield of High Yielding Varieties (HYVs), declining and degrading natural resources like land and water and acute shortage of labour make the task of increasing rice production quite challenging. The current situation necessitates looking for some innovative technologies to boost rice production.

The achievements so far in respect of raising yields and reducing variability in the unfavourable agro-climatic regions are not comparable with those realized for the favourable environments. The limited spread of the green revolution can be explained partly by the nature of available technology itself and partly by the uneven development of infrastructure, physical as well as institutional which is pre-requisite for the adoption of improved practices. Against such a background it is necessary to examine the needed changes in agricultural research strategy to boost up

agricultural production in the light of emerging agro-climatic and socio-economic challenges. Redressal of crop regional imbalances in growth, imparting stability to agricultural output and bringing the benefits of agricultural research technology to the resource poor farmers are the three major concerns.

The spread of the newer varieties replacing the older varieties need to be closely monitored to take advantage of the superior characters of these newer varieties released by various research Institutions. This will help to break the yield plateau that has been experiencing in rice crop in the recent past and to increase the production and productivity of the crop. Though a number of steps are being taken by the Government to popularize these varieties like Frontline Demonstration, mini kit supply, organizing training programmes (1-21 days) for farmers, farm women, seed growers, seed production personnel of public and private seed agencies, extension functionaries of state departments of agriculture, officials of state agricultural universities and NGOs, there is no concrete data to prove that the newer varieties of rice are spreading faster and replacing the older ones. Therefore, Present study has been conducted to assess the actual spreading of these newer varieties in terms of area with simultaneous reduction in the area under older varieties for rice crop and the increases in the average yield/ha. This will help the Government to draw a plan for augmenting the spread of the superior newer varieties in place of the age old varieties.

1.1 Objectives of the study

1. To determine the extent of adoption and the level of participation by the different categories of farmers in the cultivation of hybrid rice.
2. To assess the overall impact on rice production and productivity of hybrid rice cultivation.
3. To study the economics of cultivation of hybrid rice varieties vis-a-vis inbred varieties.
4. To identify factors determining the adoption of hybrid rice varieties.
5. To address various constraints and outline the prospects for increasing hybrid rice cultivation and finally.
6. To suggest policy measures for expansion of hybrid rice cultivation.

1.2 Database and methodology

The study is based on both secondary and primary data. Secondary data relating to area, production and productivity of rice obtained from government publications viz. various issued of Madhya Pradesh agriculture statistics, Land Record Office of Gwalior Madhya Pradesh and web sites like www.agricoop.nic.in, www.mpkrishi.org, www.dacnet.nic.in were used to arrive at the trends in area, production and productivity. For the sake of comparison, it is usual to compare the performance of rice in the pre-introduction period of hybrid rice with that in post-introduction period as a whole. Keeping in mind that the first hybrid was developed and released for commercial cultivation in India in 1994, the study period was thus divided into three sub-periods viz. 1984-85 to 1993-94, 1994-95 to 2003-04 and 2004-05 to 2009-10. The period-I viz. 1984-85 to 1993-94 refers to the pre-introduction period of hybrid rice while other two period's viz. period-II & III correspond to post-introduction periods considering the base year (The average of first three years) and the current year (The average of last three years). Besides, official data regarding the activities undertaken by the government to popularize hybrid varieties like Frontline Demonstrations, Mini kit Supply, and Organizing Training Programme etc. were incorporated and analyzed in the study.

Primary survey was confined to the National Food Security Mission (NFSM) districts in Madhya Pradesh. The two districts i.e. Rewa and Mandla having relatively higher concentration of area under rice cultivation within the group of NFSM districts were chosen for the present study. Two representative blocks namely Rewa & Raipur karchuliyan from Rewa district and Mandla & Nainpur blocks from Mandla district were selected for the investigation. Within each block two villages namely Padokher and Atriya, Mehsuva and Gorgaon 164 were selected from Rewa and Raipur Karchuliyan development blocks respectively. In case of Mandla district Semarkhapa and Padami, Tuiapani and Rewada were selected from Mandla and Nainpur development blocks respectively for the study.

In each village a complete list of cultivating households growing hybrid rice varieties and inbred varieties were prepared and stratified according to four standard land size groups such as marginal (less than 1 hectare), small (1 to 2 hectares), medium (2 to 4 hectares) and large (more than 4 hectares) including SC, ST and women farmers. In each district, 40 hybrid rice growers from the list of hybrid rice growing cultivators were drawn at random from different land size groups on the basis of their proportion in the universe. In addition to this sample, 10 inbred variety (traditional HYVs) rice growers but non-adopters of hybrid rice were selected randomly from the different land size groups amongst inbred rice growing cultivators following the same procedure. Thus, altogether,

50 rice growing cultivators were selected from each selected district. In all, 100 rice growing cultivators equally spread over two selected districts constituted the size of the sample in the study.

For the primary survey, the reference years were 2009-10. Accordingly, Kharif seasons for the rice crop covered in the study. Primary data were obtained by administering a structured schedule/questionnaire provided by the Coordinator. Agro-Economic Research Centre Visva-Bharati, Santiniketan West Bengal.

A simple tabular analysis was done to analyze the farm level data in ascertaining the farm level spread and impact of hybrid rice technology. In order to identify the factors affecting the yield of rice, yield response function separately for hybrid and inbred rice was estimated using Log linear models. Eight independent variables (Age, Education, Household size, Size of worker, Land ownership dummy, Farm size, Access to Source of information, Size of irrigated land) were found to be regressed upon the dependent variable yield per hectare of rice. The explanatory variables includes seed (kg/ha), manure (Rs./ha), fertilizer (Rs/ha), irrigation (number of irrigation/ha), human labour (man days/ha), machinery labour (hrs/ha), plant protection Chemicals (Rs./ha). In finding out the determinants of participation in hybrid rice cultivation, Logit Model was used to drawn conclusion. For secondary data obtained from the official publications, the equation of the exponential curve was used to measure the growth in area, production and productivity of the crop. In measuring the instability in crop production, the co-efficient of variation technique was used for interpretation of tabulated data.

1.3 Major findings

The major findings of the study are as under :

The trend of rice in three different periods of the study i.e. period I (1985- 1994), period II (1995-2004) and Period III (2005-2011) in Madhya Pradesh and its composition with comparison to India has been analyzed results showed that the share of Madhya Pradesh to area of rice in India was found to be decreased from 3.76 to 3.61 and 3.91 to 3.78 per cent in period I and period III, respectively, while it increased from 3.69 to 4.01 per cent in period II. The area of rice in M.P. shown increasing trend at the rate of 0.013 and 0.017 million ha per year in period I and II respectively while in Period III it shown decreasing trend at the rate of 0.0143 million ha per year.

The production of rice in M.P. showed increasing at the rate of 0.02, 0.025 and 0.034 million t per year with increase in production from 0.75 to 1.31, 1.42 to 1.87 and 1.29 to 1.77 million t in period I, II and III respectively. Period III performed better as compared to the period I and II because increased production could be achieved from decreasing area in period III.

The productivity of rice in M.P. showed increasing trend at the rate of 17.937, 1.712 and 31.692 kg/ha per year and productivity increased from 493 to 854, 900 to 978 and 804 to 1167 kg/ha in the period I, II and III respectively. The drastic increase in the productivity in period III may be due to the adoption of hybrid rice technology by the farmers in this period showing superiority of hybrid rice over HYVs.

The linear and compound growth rates of area of rice in Madhya Pradesh were worked out as 0.00, 1.05 and -0.86 per cent (linear) and 0.01, 1.06 and -0.87 per cent per year (compound) as against of 0.57, -0.03 and 0.02 per cent (linear) and 0.53, -0.04 and 0.01 per cent per year (compound) in India for the periods I, II and III respectively.

The share of Madhya Pradesh to production of rice in India was found to be increased from 1.67 to 1.75, 1.62 to 1.89 and 1.63 to 1.66 per cent in period I, II and III, respectively. The analysis revealed 10.73, 17.73 and 7.48 per cent of relative change with an annual fluctuation of 18.89, 23.44 and 12.78 per cent in the State as against 24.69, 5.47 and 5.71 per cent of relative change with annual fluctuation of 11.74, 7.49 and 5.76 per cent in India in period I, II and III respectively.

The linear and compound growth rate of Production of rice in Madhya Pradesh were determined as 2.46, 1.87 and 2.28 per cent (linear) and 2.81, 1.21 and 2.27 per cent year (compound) as against of 3.42, 0.68 and 1.43 per cent (linear) and 3.51, 0.62 and 1.48 per cent per year (compound) in India from the periods I, II and III respectively.

The difference in average productivity of rice between India and Madhya Pradesh ranges from 701 to 1129,967 to 1287 and 1057 to 1349 kg/ha in the period I, II and III respectively. Analysis showed 12.50, -1.03 and 11.37 per cent of relative change with an annual fluctuation of 18.07, 17.03 and 13.38 per cent in the State as against 21.23, 55.55 and 5.25 per cent of relative change with annual fluctuation of 9.58, 5.56 and 3.88 per cent in India in period I, II and III respectively.

The annual linear and compound growth rate of productivity of rice in Madhya Pradesh were worked out as 2.44, -0.21 and 3.36 per cent (linear) and 2.80, -0.50 and 3.32 per cent per year (compound) as against of 2.89, 0.69 and 1.44 per cent (linear) and 2.96, 0.65 and 1.47 per cent per year (compound) in India for the periods I, II and III respectively.

The NFSM districts cover only 49.41 percent of total rice area of M.P. The maximum area was found to be in Rewa district (16.17%) and minimum in Panna district (6.79%). The productivity of rice was found to be higher in other districts (1227.15 kg/ha) as compared to State (1010.67 kg/ha) and total NFSM districts (705.37 kg/ha).

The 50 per cent districts of the State (25 districts) contributed 97.47 per cent while remaining 50 per cent districts (25 districts) contributed only 2.53 per cent of

total rice area of Madhya Pradesh. The highest area (15.18%) and production (20.53%) was found in Balaghat district while highest productivity (2330.33 kg/ha) was observed in Gwalior district of Madhya Pradesh. The area and production of rice in Madhya Pradesh was found to be 1641 million ha and 1570.87 million tonnes respectively in the triennium ending of the year 2010.

The following findings were observed on the basis of primary data recorded in the area under study during the year 2009-10 and 2010-11 :

The majority of adopter respondents (80) were male (96.28%), comes under the age group of 16-60 years (90%), educated up to secondary (52.50 %) followed by graduate (15%), primary (12.50%), illiterate (10.0%) and above graduate (6.24%) categories. The majority of non adopters (20) were found to be educated up to secondary level (55%) followed by illiterate (20%), up to graduate level (15%) and up to primary (10%), Hence, it is clear that adopters of hybrid rice technology are more educated than the non adopters.

The majority of adopters 57.5, 16.25, 13.75 and 12.50 per cent and non adopters 60, 25, 10 and 5 per cent belonged to OBC, General, SC and ST categories, respectively.

Self employed farming was found to be main occupation of the head of the family in adopters (73.75%) and non adopters (65%). The 11.25 per cent adopters and 20 per cent non adopters were found to be worked as agricultural labour in the study area.

The average size of operational land holding of adopters and non adopters was found to be 4.73 ha and 4.09 ha, ownership land holding was 4.29 ha and 3.66 ha and land under irrigation was 98.39 & 93.39 per cent was found in the above categories, respectively.

Hybrid rice (37.63%), followed by soybean (28.37%), HYV paddy (27.63%) were found to be main crops cultivated by adopter in Kharif season, while HYV paddy (60.44%), soybean (26.73%) were the major crops grown by the non adopter of hybrid rice farmers in the year 2009-10.

The situation have somewhat changed in the year 2010-11, the area of hybrid rice adapters under hybrid rice increased slightly from 37.63 per cent (2009-10) to 41.03 per cent (2010-11), while the area under soybean (27.58%) decreased slightly. But in case of non adopters the area under HYVs of paddy and soybean increased slightly and area under other crops decreased.

In Rabi season wheat and gram were observe as major crops grown by the adopters and non adopters both in approximately 70 and 20 per cent area during both the years. The slight variation was observed in the area of wheat and gram of adopter farmers. The area under wheat decreased slightly from 72.69% (2009-10) to 69.69% (2010-11) while, area under gram increased from 16.33 per cent (2009-10) to

both the years. It is to observe that adopters prefer cereals followed by pulses crop rotation in place of cereal followed by cereal crop rotation in the area under study. As regards to other Rabi crops slight change in area was noticed in the cultivator's fields.

The area under HYV s of rice was found to be decreased in the year 2010-11 as compared to the year 2009-10 from 0.27 ha to 0.18 ha (marginal), 0.52 ha to 0.53 ha (small), 0.80 ha to 0.80 ha (semi -medium), 1.64 ha to 1.57 ha (medium) and 2.59 ha to 2.93 ha (large). The area under hybrid rice was found to be increased in the year 2010-11 as compared to the year 2009-10 from 0.40 ha to 0.51 ha (marginal), 0.82 ha to 0.86 ha (small), 0.94 ha to 1.06 ha (semi medium), 1.90 ha to 2.52 ha (medium) and 4.26 ha to 4.31 ha (large). At overall level average size of holding was found to be 4.31 ha. The area under hybrid rice increased from 1.66 ha (2009-10) to 1.85 ha (2010-11), while the area under HYVs of rice increased from 1.17 ha to 1.20 ha (2010-11) in area under study.

The majority (85%) of adopters of hybrid rice reported that extension workers of the Department of Farmers Welfare and Agriculture Development were the one of the main source of information on hybrid rice for dissemination of technology followed by Krishi Vigyan Kendra (60%), input dealer (46.25%) and radio (40%). The Front Line Demonstration program conducted by Govt. (33.75%), television (33.75%), news papers (20%) participation in training programme organized by the Govt. (18.75%) and progressive farmers (13.75%), output buyers food processors credit agency, NGO/ private agency were found to be the other sources of information on hybrid rice technology.

The majority (50%) of the respondents reported that extension workers of the State Department of Agriculture worded at satisfactory level in respect dissemination of quality information while 25 and 8 per cent of the respondents reported that information received was of good and poor quality, respectively.

Logit analysis has been performed to analyse the determinants of participations in hybrid rice cultivation and found that none of the independent variables considered in the model has yielded a significant relationship with the dependent variable. However, the signs of Z-statistics are as expected and indicate the direction of relationship between the dependent and independent variables. Age, farm-size, and no. of workers shown negative relationship (i.e. higher is the age/farm-size/workers, the lower is the probability of adopting hybrid varieties of rice). Education, household size and irrigation availability shown positive relationship (i.e. higher the education/HH size/irrigation, the higher is the probability of adopting hybrid rice). On the whole, the model fails to identify factors that influence decision in adopting hybrid rice cultivation. This further pointed out that there might be some other factors

at work influencing a decision regarding adoption of hybrid varieties of rice.

As regards adoption of recommended package of practices in rice cultivation is concerned, it was recorded that hybrid rice adopters reported to adopt recommended package of practices of hybrid rice cultivation after receiving information through various sources such as extension worker of the state department of agriculture, KVKs, participation in training and demonstration programmes organized by the government were found to be 57.5, 45, 22.5 and 15 per cent, respectively, in case of hybrid rice adopters cultivating HYV of rice the percentage of respondents were adopt full package of practices were found to be 47.5, 52.5, 16.25 and 10, respectively and in case of non adopters it was observed as 38.75, 42.5, 26.25 and 20 per cent respectively.

The majority (57.5 & 65%) of adopter depended on private sector in both the years (2009-10) and (2010-11), respectively followed by public sector on partial subsidy and public sector on full subsidy. The mean yield of hybrid rice over the HYV s of rice had been found to be increased by about 40% across all the categories of farmers.

In the adopter of hybrid rice farms, all the factors of production were found to be positive except expenses on bullock labour, which was negative and significant. The expenses on seed (0.152***), chemical fertilizer (0.082***), human labour (0.243***) were positive and highly significant, which reveals that if all things remains constant and at the present level of technological adoption an additional expense of Rs. 1/- each on seed, chemical fertilizer and human labour will be able to increase the yield of hybrid rice up to 0.152, 0.082 and 0.243 kg/ha respectively. The expenses on manures, pesticides, machine labour were found to be positive but non significant, which shows the need to provide extra attention while using these crucial inputs at their farms. There is also a need to provide skill oriented training and demonstration to them at their field. The coefficient of multiple regressions was found to be 0.568. Hence, the fitted function is good fit and able to explain 56.80 per cent variability in the yield of hybrid rice.

As regards to non adopter of hybrid rice growing HYVs of rice, all the factors of production were found to be positive except expenses on bullock (-0.402) and machine (-0.406) labour. The expenses on fertilizer (0.181**), irrigation (0.24*) and human labour (0.440* **) were positive and significant whereas expenses on seed (0.134), manures (0.012), pesticides (0.002) were positive but non significant. Hence, there is need to replace the seed of HYVs by hybrid seed and provide skill oriented training regarding package and practices of hybrid as well as HYVs of rice at farmers' fields as the majority of farmers reported that they had lack of knowledge of recommended package of practices. The fitted function is found to be good fit as it is able to explain 79.7% variability of selected independent variables in the yield of HYVs.

The adopter of hybrid rice over the HYVs of rice cultivators (adopter and non adopter) had been found to use less quantity of seed, manures and bullock labour and more quantity of chemical fertilizer, number of sprays of pesticides, number of irrigations and human labour in cultivation of hybrid rice in the area under study.

The comparison of cost and return between hybrid rice and inbred rice in the year 2009-10 showed that hired human charges was found to be main component of the total cost followed by machine charges, seed chemical fertilizer, manures, insecticide, pesticide and irrigation both in the adopter of hybrid rice as well as inbred rice. In cultivation of hybrid rice, expenses on seed, manures, chemical fertilizer, machine labour, hired labour, etc. were found higher than the inbred rice. The total cost of cultivation of rice (HYVs) was found Rs. 14536.46/ha (in case of adopter of hybrid rice but also cultivated HYVs, hybrid rice adopter) and Rs. 14515.40/ha (non adopter) while in case of hybrid rice it was found Rs. 18339.21/ha which was about 20 per cent higher than the HYVs of rice.

The cost of production of hybrid rice was found 29.24 per cent lower (from Rs. 3.89/-Kg to Rs. 3.01/-Kg) as compared to inbred rice in the farms of hybrid rice adopter 52.41 per cent lower (from Rs. 4.62/-Kg to Rs. 3.01/-Kg) at non adopter of hybrid rice farm in the year 2009-10. This was due to the 43.07 per cent and 52.41 per cent higher production of hybrid rice (49.80q/ha.) as compared to inbred rice respectively in adopter of hybrid rice farm and non adopter of hybrid rice farms, respectively.

The net returns from hybrid rice (Rs. 35631.64) was found to be 48.36 per cent and 58.30 per cent more as compared to inbred rice in the fields of hybrid rice adopter (18400.18/ha) and non adopter farms Rs (14858.59/ha). The benefit cost ratio of hybrid rice cultivation (2.94) was also found higher as compared to inbred rice at hybrid rice adopter (2.27) and non adopter (2.02) farmers' fields.

The cultivation of hybrid rice provided employment to 90.12 human labour days per hectare, out of which 60.44 days were hired labour and 29.68 days were family labour while the cultivation of HYVs provided employment to 83.28 days per hectare, out of which 36.1 days were family labour. The percentages of, female labour used to the total labourers engaged were 49.79 and 47.85 per cent in case of hybrid and HYVs rice, respectively.

In hybrid rice, the highest labour (days/ha) was found to be engaged in transplanting of seedlings (35) followed by harvesting (24.45), weeding (8.27), uprooting of seedlings (7.2), spraying of plant protection chemicals (2.31) and ploughing of land for field preparation (2.37) application of chemical fertilizers (2.24) operations while in HYVs of rice cultivation the highest labour were found to be used in transplanting of seedlings (29.55) followed by harvesting (23.22), weeding (9.30), uprooting of seedlings (6.78), spraying of plant protection chemicals (2.42),

application of chemical fertilizers (2.83) and ploughing of land for field preparation (2.44) operations.

In the year 2009-10, overall average size group 84.80% and 75.22% of Total output (unhusked rice) have been found to be sold in the market and rice growers received a price of Rs. 1014.7/q and 1068.19/q by adopters of hybrid and HYVs rice respectively. Very little variation was found in quantity sold by the farmers for hybrid and HYVs because in the study area Government bodies are active and buy all the portion of rice from the farmers at Minimum Support Price just after the harvest of crop. As regards to different size of farms, not much variation was found in quantity sold by the farmers for hybrid. It ranged between 82.64% (marginal) to 91.49% (semi medium) and price received range from Rs. 988/q (marginal) to Rs. 1066/q (semi medium).

As regard to non adopters are concerned, overall average farmers sold only 68.19% of total output in the market at an average price of Rs. 1098.83/q which ranged between 55.10% (marginal) to 74.95% (large) at the price of Rs. 1040/q (marginal) to Rs.1143.33/q (semi medium).

In the year 2010-11 un husked rice on overall size 87.71% and 75.59% respondents were found to be sold in the market on an average price of Rs. 1075.48/- q and Rs. 1141.91/q by adopters of hybrid rice and HYVs growers respectively, while non adopters sold their 68.97% of total output in the market on an average rate of Rs. 1125.83/q. The quantity sold in different size of farm was found to be similar and ranged from 74.46 % (small) to 91.11 % (semi medium) with respect to hybrid adopter respondents, 68.18 % (marginal) to 81.13 % (small) with respect to adopter cultivated HYVs rice and 47.25 % (small) to 76.73 % (semi medium) with respect to non adopter respondents.

The price of output was also found to be similar in all the categories of farms ranged from Rs. 1036.50/q (marginal) to Rs. 1098/q (large) with respect to adopter of hybrid rice, Rs. 1103.18/q (small) to Rs. 1180/q (semi medium) at hybrid adopter farmers cultivated HYVs rice and Rs. 1051.25/q (marginal) to Rs. 1191.25/q (large) at non adopter farms.

The output and sale of rice (husked) at overall level showed 71.48% and 45.61 % were found to be sold in the market on an average price of R . 1307.02/- and Rs. 1500.00/q by adopters of hybrid rice and HYVs respectively While, non adopters sold their 46.25 % of total output in the market on an average rate of Rs. 1450/q. The quantity sold in different size of farm was found to be similar and ranged from 34.44 % (marginal) to 85.18 % (large) with respect to hybrid adopter respondents, 0.00% (marginal) to 50.97 % (large) with respect to adopters cultivated HYVs rice and 0.00% (marginal and large) to 58.39% (semi medium) with respect to non adopter respondents. The price of output was also found to be similar in all the categories of farms ranged from Rs. 1257.50/q (small) to Rs. 1346.25/q (semi-

medium) with respect to adopter, Rs. 1400.00/q (semi medium) to Rs. 1600/q (medium) at hybrid adopter farmers cultivated HYVs rice and Rs. 1400.00/q (semi medium) to Rs. 1500.00/q (medium) at non adopter farms.

The 69.26 % and 50.59 % output and sale of rice (husked) in different size of farms in the year 2010-11 were found to be sold in the market on an average price of Rs. 1411.00/- and Rs. 1505.56/q by adopter of hybrid rice and HYVs growers respectively, while non adopters sold their 45.38% of total output in the market on an average rate of Rs. 1533.33/-. The quantity sold in different size of farm was found to be similar and ranged from 43.14 % (marginal) to 81.49 % (large) with respect to hybrid adopter respondents, 20.94 % (marginal) to 59.29% (medium) with respect to adopter cultivated HYVs rice and 0.00% (marginal) to 57.78 % (medium) with respect to non adopter respondents. The price of output was also found to be similar in all the categories of farms ranged from Rs. 1317.50/q (small) to Rs. 1500.00/q (large) with respect to adopter, Rs. 1500.00/q (Semi medium) to Rs. 1516.67/q (medium) at hybrid adopter farmers cultivated HYVs rice and Rs. 1450.00/q (semi medium) to Rs. 1650.00/q (medium) at non adopter farms.

The maximum quantity of the hybrid rice has been found to be sold in the months of December (65.67%) following by November (20.54%), January (10.04%) and July (3.76). About 96% of the total hybrid rice has been sold by the adopter hybrid growers just after the harvest of the crop, HYVs rice growers sold their produce of rice in all the months of year, here also the maximum quantity sold in December (23.93) following by November (16.39%), January (14.14%) but only 55% of the rice has been found to be sold in this harvest period. The remained portion (45%) was found to be sold in other months of the year. The same result has been observed for non adopter farmers. Their maximum quantity has been found to be sold in the peak period i.e. just after the harvest of rice. They sold them 56% of marketed surplus in these months and rests were found to be sold in different months of year.

The hulling milling ratio was found to be about 36:64 for adopters and non adopters of hybrid rice or HYVs rice showed that only 64% of the rice whether it is hybrid or inbred processed in mills in the area under study. The head rice recovery ratio was found to almost same hybrid as well as HYVs rice in both the years of the study.

The majority of sample farmers reported that the seed of hybrid rice was easily available to them (78.8%) from the Department of Agriculture and retailer of local market. The majority of them also reported that they were got good quality of hybrid seed (61.3%) at a reasonable price (61.3%) and they were satisfied from the quality of seed. Cent percent farmers reported that hybrid seed gave better results than the inbred seed. The majority of farmers (42.5)

reported that yield increases up to 5-10%, while 32.5% and 25.0% reported yield increased up to 10-15% and 15-20% respectively all the used to purchase seed of hybrid rice every year. All the respondents also reported that the adoption of hybrid seed did not prevent the traditional practice of saving and exchange of seed. The majority of hybrid seed adopter further reported that they replaced the variety of hybrid seed after 3 years or more (67.5%), while 25.5%, 8.7% and 1.3% reported that they replaced it every 3 years every, alternate year and every year respectively.

All the hybrid rice growers of the study area reported that they were used chemical fertilizer in cultivation of hybrid rice, while only 41.25% of them reported that they received information from any source regarding to use and dose of fertilizer, but only 31.25% of sample respondents applied recommended dose of fertilizer in the cultivation of hybrid rice, the remaining (68.75%) were not able to apply it due to non availability of desired fertilizers at the time of application and its higher rate. Cooperative Societies are the main sources of fertilizer followed by market. The 77.5% of sample farmers reported that the cultivation of hybrid rice required more fertilizer as compared to inbred rice.

The majority of hybrid rice adopter reported that the attack of pest and diseases was found less as compared to hybrid rice (63.75%) and only 31.25% of respondent applied pesticide to control pest in their field. The majority of adopter also reported that hybrid rice varieties are more susceptible to pest and diseases but respondent (76.25%) don't know the correct dose of pesticide for these hybrid seed varieties and felt that the cultivation is highly sensitive to crop management practices and use of key inputs and time bound operations (78.75%). The majority (90%) of them also reported that the yield loss was found to be more in hybrid rice as compared to inbred rice.

The majority of respondents reported that hybrid rice cultivation required more credit as compared to HYVs rice (83.75%). They (86.75%) also reported about easy availability of institutional credit from cooperative credit societies and branches of commercial banks, but there is a need for less documentation work for getting crop loan. Government used to buy the entire produce at Minimum Support Price through cooperative societies.

The State Agriculture Department was found to be a primary source of extension of to hybrid rice technology. The majority of farmers (72.5%) reported that Front Line Demonstration programmes were organized in their area by the field workers to create awareness among them and 33.75 per cent of them were found to be participated in that programme. The 42.5 per cent farmers reported that State Department officers also organized training programme for them and 67.6% of them reported that they were participated in these training programme.

The farmers reported that they got better yield gain from cultivation of hybrid rice over inbred rice. The production of hybrid rice was also found profitable over inbred rice even the qualities of grain was found poor (70%), no taste (3.75%), poor cooking quality (15%) and stickers of cooked rice (11.25%). The majority of them (88.75%) also reported that grain was found to be acceptable to traders and retailer. The majorities of them (83.75%) also reported that hybrid rice technology was found to be economically viable in the area and due to high yield as reported by 59 per cent of farmers and price are equal to the HYVs of rice farmers sown their interest to cultivation of hybrid rice in the future also.

The majority of non adopter of hybrid rice reported that they have heard about the new hybrid varieties of hybrid rice (75%) viz. KRH2, 6444, 9090, DRH775, JRH- 5, VS-312 and RHIO and Govt. Hybrid rice promotion programme (80%). The majority of them (75%) reported that they have seen standing Hybrid rice crop in their area. They have reported that the Rural Agricultural Extension Officer (63.64%) and relatives (27.27%) were suggested them to grow Hybrid rice seed at their field and 65% of them were convinced with their suggestions and will grow these varieties in next year.

The 35% of non adopters were not convinced to grow the Hybrid rice seed in this year due to non availability of seed in time (66.67%), non availability of pure hybrid seed (33.33%), low germination of seed provided by Govt. (20%) not convinced that its yield is sufficiently higher than HYVs (25%), higher risk (25%) variety too coarse seed of high quality (20%), high cost of seed (20%), and not heard of Govt. assistance for expansion of hybrid rice seed (20%). It is a good sign for NFSM programme for rice that all of the non adopters are now ready to accept new hybrid rice varieties in future considering superior grain quality and higher yield potential (100%).

1.4 Policy Implications

On the basis of above findings the following policy implications are as under :

1. The advent of new hybrids of rice leads to manifold increase in its production, but the yield gap is still wide as compared to its yield potential. It should be reduced by providing skill oriented training and by conducting more method and result demonstration. (Action: Department of Farmers Welfare and Agriculture Development Madhya Pradesh/KVKs/ and SAUs)
2. Feeding teeming population in declining area sent the caution signal against the complacency in the future food security at national, regional and house hold level. Rice is a choice crop of

the millions of poor and small farmers not only for income but also for house hold food security. This will be done with effective implementation of production programme e.g. NFSM and BGREI (Action: Ministry of Agriculture and Cooperation State/Central Govt)

3. The replacement of HYVs by hybrids is found very low and needs to be given priority as it was found that the cultivation of hybrid rice found to be more profitable as compared to HYVs. This will definitely increase the productivity of the crop, income of the farmers, which bring the desirable changes in the standard of living of the farming community. (Action: Department of Farmers Welfare and Agriculture Development Madhya Pradesh).
4. Programmes like BGREI (Bringing Green Revolution in Eastern India) must be implemented for hybrid rice in the areas where rice is being grown. (Action: Department of Farmers Welfare and Agriculture Development Madhya Pradesh).
5. Efforts should be made to encourage the progressive farmers and officers of KVKs to popularise hybrid rice through training and other incentives. (Action: Department of Farmers Welfare and Agriculture Development Madhya Pradesh).
6. The emphasis should be given to conduct more number of demonstrations on the fields of marginal and small farmers. (Action: Department of Farmers Welfare and Agriculture Development Madhya Pradesh/KVKs/ and SAUs).
7. There is need to replace the seed of HYVs by hybrid seed and provide skill oriented training regarding package and practices of hybrid as well as HYVs of rice at farmers' fields as the majority of farmers reported that they had lack of knowledge of recommended package of practices. (Action: Department of Farmers Welfare and Agriculture Development Madhya Pradesh/KVKs/ and SAUs)
8. Government must provide subsidy to the hybrid rice growers in purchasing inputs and provide incentives in purchasing hybrid rice at MSP. (Action: Ministry of Agriculture and Cooperation State/Central Govt).
9. As the district-wise data related to different parameters of production of hybrid rice has not been available in land record office, Gwalior (M.P.) and in the department of Farmers' Welfare and Agriculture Development, Bhopal. Hence

efforts should be made sure for the availability of the same for the research workers for further research and other activities. (Action: Directorate of Economics & Statistics Madhya Pradesh Bhopal).

10. Access to information must be increased through government agencies or KVKs, as the result of the study shows that the majority of the farmers were found to be dependent on input dealers for their requirement of seed and technical knowhow. Hence, seed developed by government agencies must be in adequate quantity and should be made available at the time of sowing at grass root level on regular basis for its wide adoption. (Action: Department

of Farmers Welfare and Agriculture Development Madhya Pradesh/KVKs/and SAUs)

11. As the result of the study shows that the maximum quantity (96%) of hybrid rice has been sold just after the harvest of the crop in the month of November, December and January at non remunerative prices due to lack of storage facilities at house hold level and unable to fetch the remunerative prices. Hence there is need to provide storage facilities at grass root level. This will not only stop the wastage of precious staple food rice but also stabilises the prices in long run. (Action: Department of Farmers Welfare and Agriculture Development Madhya Pradesh/ KVKs/ and SAUs).

D. Commodity Reviews

(i) Foodgrains

During the month of September, 2013 the Wholesale Price Index (Base 2004-05=100) of pulses, Foodgrains and

cereals increased by 1.53%, 1.43% and 1.42% respectively over the previous month.

ALL INDIA INDEX NUMBER OF WHOLESALE PRICES

(Base : 2004-2005=100)

Commodity	Weight (%)	WPI for the Month of September, 2013	WPI for the Month of August, 2013	WPI A year ago	Percentage change during	
					A month	A year
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Rice	1.793	231.7	229.2	195.1	1.09	18.76
Wheat	1.116	210.1	205.3	198.4	2.34	5.90
Jowar	0.096	241.2	240.7	234.9	0.21	2.68
Bajra	0.115	251.4	252.2	235.6	-0.32	6.71
Maize	0.217	259.8	255.5	234.1	1.68	10.98
Barley	0.017	213.4	210.3	200.8	1.47	6.27
Ragi	0.019	348.9	356.9	269.9	-2.24	29.27
Cereals	3.373	227.9	224.7	201.6	1.42	13.05
Pulses	0.717	225.8	222.4	260.8	1.53	-13.42
Foodgrains	4.09	227.5	224.3	212.0	1.43	7.31

Source : Office of the Economic Adviser, M/o Commerce and Industry.

Behaviour of Wholesale Prices

The following Table indicates the State wise trend

of Wholesale Prices of Cereals during the month of September, 2013.

Commodity	Main Trend	Rising	Falling	Mixed	Steady
Rice	Rising	Jharkhand			
Wheat	Rising	Haryana M.P.		Rajasthan U.P.	Jharkhand Karnataka
Jowar	Falling	Gujarat Rajasthan			Karnataka
Bajra	Steady	Karnataka			
Maize	Rising	Gujarat Karnataka	Falling U.P.		Haryana

Procurement of Rice

0.05 million tonnes of Rice (including paddy converted into rice) was procured during September, 2013, as against 0.11 million tonnes of Rice (including paddy converted into rice) procured during September, 2013. The

total procurement of Rice in the current marketing season i.e 2012-2013, upto 30.09.2013 stood at 34.02 million tonnes, as against 33.97 million tonnes of rice procured, during the corresponding period of last year. The details are given in the following table.

PROCUREMENT OF RICE

(in thousand tonnes)

State	Marketing Season 2012-13 (up to 30-09-2013)		Corresponding Period of last Year 2011-12		Marketing Year (October-September)			
	Procure- ment	Percentage to Total	Procure- ment	Percentage to Total	Procure- ment	Percentage to Total	Procure- ment	Percentage to Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Andhra Pradesh	6457	18.98	7547	21.62	7548	21.53	9609	28.10
Chhatisgarh	4804	14.12	4115	11.79	4115	11.74	3746	10.95
Haryana	2609	7.67	2007	5.75	2007	5.72	1687	4.93
Maharashtra	192	0.56	190	0.54	190	0.54	308	0.90
Punjab	8558	25.16	7731	22.14	7731	22.05	8635	25.25
Tamil Nadu	481	1.41	1596	4.57	1596	4.55	1543	4.51
Uttar Pradesh	2286	6.72	3350	9.60	3357	9.58	2554	7.47
Uttarakhand	497	1.46	368	1.05	378	1.08	422	1.23
Others	8132	23.90	8010	22.94	8138	23.21	5694	16.65
Total	34016	100.00	34914	100.00	35060	100.00	34198	100.00

Source: Department of Food and Public Distribution.

Procurement of Wheat

The total procurement of wheat in the current marketing season i.e 2013-2014 upto September, 2013 is 25.09

million tonnes against a total of 38.11 million tonnes of wheat procured during last year. The details are given in the following table.

PROCUREMENT OF WHEAT

(in thousand tonnes)

State	Marketing Season 2013-14 (upto 01-08-2013)		Corresponding Period of last Year (2012-13)		Marketing Year (April-March)			
	Procure- ment	Percentage to Total	Procure- ment	Percentage to Total	Procure- ment	Percentage to Total	Procure- ment	Percentage to Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Haryana	5873	23.41	8666	22.74	8665	22.71	6928	24.45
Madhya Pradesh	6355	25.33	8507	22.32	8493	22.26	4965	17.52
Punjab	10897	43.43	12836	33.68	12834	33.64	10958	38.67
Rajasthan	1268	5.05	1964	5.15	1964	5.15	1303	4.60
Uttar Pradesh	683	2.72	5063	13.29	5063	13.27	3461	12.21
Others	16	0.06	1071	2.81	1129	2.96	720	2.54
Total	25092	100.00	38107	100.00	38148	100.00	28335	100.00

Source: Department of Food and Public Distribution.

(ii) Commercial Crops

OIL SEEDS AND EDIBLE OILS : The Wholesale Price Index (WPI) of nine major oilseeds as a group stood at 196.4 in September, 2013 showing an increase of 1.3 per cent over the previous month. However, it decreased by 5.1 per cent over the previous year.

The Wholesale Price Index (WPI) of all individual oilseeds showed a mixed trend. The WPI of Copra (6.6 per cent), Cotton Seed (0.2 per cent), Sunflower (2.6 per cent), Soyabean (3.9 per cent) Gingelly seed (3.7 per cent), Niger seed (3.7 per cent), and Rape & Mustard (2.3 per cent) increased over the previous month. However, the WPI of Groundnut seed (3.5 per cent) and Safflower (1.0 per cent) decreased over the previous month. The Wholesale Price Index (WPI) of Edible Oils as a group stood 146.8 in September, 2013 showing an increase of 0.5 per cent over the previous month. However, it decreased by 2.7 per cent over the previous year. The WPI of Copra oil (2.2 per cent), Cottonseed Oil (0.8 per cent), Soyabean Oil (0.2 per cent), Mustard oil (0.4 per cent) and Sunflower Oil (1.6 per cent) increased over the previous month. However, the WPI of Groundnut Oil (0.5 per cent), and Gingelly Oil (0.8 per cent) increased over the previous month.

FRUITS AND VEGETABLE : The Wholesale Price Index (WPI) of Fruits and Vegetable as a group stood at 292.3 in September, 2013 showing an increase of 0.6 per cent and 50.0 per cent over the previous month and over the previous year.

POTATO : The Wholesale Price Index (WPI) of Potato stood at 212.9 in September, 2013 showing a fall of 5.0 per cent and 12.3 per cent over the previous month and year, respectively.

ONION : The Wholesale Price Index (WPI) of Onion stood 845.6 in September, 2013 showing an increase of 16.9 per cent and 335.9 per cent over the previous month and over the previous year.

CONDIMENTS AND SPICES : The Wholesale Price Index (WPI) of Condiments & Spices (Group) stood at 235.8 in September, 2013 showing an increase of 1.7 per cent and 12.2 per cent over the previous month and over the previous year.

The WPI of Black Pepper and Chillies (Dry) increased by 0.6 per cent and 0.4 per cent, over the previous month. However, the WPI of Turmeric decreased by 1.1 per cent over the previous month.

RAW COTTON : The Wholesale Price Index (WPI) of Raw Cotton stood at 254.8 in September, 2013 showing an increase of 1.4 per cent and 20.4 per cent over the previous month and over the previous year.

RAW JUTE : The Wholesale Price Index (WPI) of Raw Jute stood at 244.7 in September, 2013 showing an increase of 0.3 per cent over the previous month. However, it decreased by 4.2 per cent over the previous year.

WHOLESALE PRICE INDEX OF COMMERCIAL CROPS FOR THE MONTH OF SEPTEMBER, 2013

(Base Year : 2004-05=100)

Commodity	Latest	Month	Year	Percentage Variation over a	
	Sept., 2013	August, 2013	Sept., 2012	Month	Year
<i>OIL SEEDS</i>	196.4	193.8	207.0	1.3	-5.1
Groundnut Seed	210.3	217.9	243.0	-3.5	-13.5
Rape & Mustard Seed	189.0	184.7	214.8	2.3	-12.0
Cotton Seed	183.9	183.5	172.8	0.2	6.4
Copra (Coconut)	108.9	102.2	89.9	6.6	21.1
Gingelly Seed (Sesamum)	396.4	382.3	316.6	3.7	25.2
Niger Seed	172.4	166.3	210.9	3.7	-18.3
Safflower (Kardi Seed)	155.1	156.7	154.2	-1.0	0.6
Sunflower	202.7	197.6	179.5	2.6	12.9
Soyabean	211.9	203.9	241.4	3.9	-12.2
<i>EDIBLE OILS</i>	146.8	146.1	150.9	0.5	-2.7
Groundnut Oil	179.3	180.2	192.0	-0.5	-6.6
Cotton Seed Oil	178.2	176.8	188.6	0.8	-5.5
Mustard & Rapeseed Oil	152.9	152.3	157.2	0.4	-2.7
Soyabean Oil	159.3	159.0	168.6	0.2	-5.5
Copra Oil	123.3	120.7	112.5	2.2	9.6
Sunflower Oil	136.5	134.3	138.9	1.6	-1.7
Gingelly Oil	171.4	172.8	165.9	-0.8	3.3
<i>FRUITS AND VEGETABLES</i>	292.3	290.6	194.9	0.6	50.0
Potato	212.9	224.0	242.7	-5.0	-12.3
Onion	845.6	723.1	194.0	16.9	335.9
<i>CONDIMENTS AND SPICES</i>	235.8	231.8	210.2	1.7	12.2
Black Pepper	535.4	532.1	531.1	0.6	0.8
Chillies (Dry)	253.4	252.3	230.4	0.4	10.0
Turmeric	210.2	212.5	171.4	-1.1	22.6
Raw Cotton	254.8	251.2	211.7	1.4	20.4
Raw Jute	244.7	244.0	255.3	0.3	-4.2

Source : Dte. of Eco. and Statistics. Commercial Crops Division.

PART II—Statistical Tables

A. Wages

1. DAILY AGRICULTURAL WAGES IN SOME STATES (CATEGORY-WISE)

(in Rupees)

State/Distt.	Village	Month and Year	Normal Daily Working Hours	Field Labour			Other Agri. Labour			Herdsman			Skilled Labour		
				Man	Wo-man	Non Adult	Man	Wo-man	Non Adult	Man	Wo-man	Non Adult	Car-penter	Black-smith	Cob-ler
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
<i>Andhra Pradesh</i>															
Krishna	Ghantasala	May., 2013	8	250.00	150.05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Guntur	Tadikonda	May., 2013	8	NA	NA	NA	NA	NA	NA	200	NA	NA	NA	NA	NA
Rangareddy	Arutla	May, 2013	8	225.00	175.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
<i>Karnataka</i>															
Bangalore	Harisandra	May to June, 2012	8	200.00	150.00	NA	200.00	150.00	NA	250.00	180.00	NA	300.00	300.00	NA
Tumkur	Gedlahali	May to June, 2012	8	160.00	160.00	NA	180.00	160.00	NA	180.00	160.00	NA	180.00	180.00	NA
<i>Maharashtra</i>															
Nagpur	Mauda	Feb., 2012	8	100.00	100.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ahmednagar	Akole	Feb, 2012	8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
<i>Jharkhand</i>															
Ranchi	Gaintalood	April, 2012	8	100.00	100.00	NA	90.00	90.00	NA	58.00	58.00	NA	170.00	150.00	NA

1.1 DAILY AGRICULTURAL WAGES IN SOME STATES (OPERATION-WISE)

(in Rupees)

State/Distt.	Centre	Month and Year	Type of Labour	Normal Daily Working Hours	Ploughing	Sowing	Weeding	Harvesting	Other Agri. Labour	Herdsman	Skilled Labour		
											Car-penter	Black-smith	Cob-ler
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
<i>Assam</i>													
Barpeta	Loharapara	March, 12	M	8	180.00	180.00	180.00	180	180	180.00	180.00	180.00	180.00
			W	8	NA	NA	160.00	160	160	NA	NA	NA	NA
<i>Bihar</i>													
Muzaffarpur	Bhalui Rasul	April to, June, 2012	M	8	130.00	120.00	80.00	130	150	120	200.00	180.00	250.00
			W	8	NA	NA	NA	NA	NA	NA	NA	NA	NA
Shekhpura	Kutaut	May and June, 2012	M	8	NA	NA	185.00	NA	185.00	NA	245.00	NA	NA
			W	8	NA	NA	NA	NA	NA	NA	NA	NA	NA
<i>Chhattisgarh</i>													
Dhamtari	Sihaba	June, 2013	M	8	400.00	100.00	NA	NA	80	80.00	250	100	100.00
			W	8	NA	80.0	NA	NA	70	80	150	NA	NA
<i>Gujarat</i>													
Rajkot	Rajkot	Jan., 2013	M	8	209.00	225	150.00	170.00	147	150.00	360.00	360.00	240.00
			W	8	NA	169	150.00	179.00	145	142.00	NA	NA	NA
Dahod	Dahod	Jan., 2013	M	8	100.00	100	100.00	100.00	100	NA	200.00	144.00	150
			W	8	NA	100	100.00	100.00	100	NA	NA	NA	NA
<i>Haryana</i>													
Panipat	Ugarakheri	March, 2013	M	8	180.00	180	180.00	200.00	180.00	NA	400.00	400.00	NA
			W	8	NA	150	150.00	180.00	150.00	NA	NA	NA	NA

1.1 DAILY AGRICULTURAL WAGES IN SOME STATES (OPERATION-WISE)—Contd.

(in Rupees)

State/Distt.	Centre	Month and Year	Type of Labour	Normal Daily Work-ing Hours	Plough-ing	Sow-ing	Weed-ing	Harvest-ing	Other Agri. Labour	Herds-man	Skilled Labour		
											Car-penter	Black-smith	Cob-ler
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
<i>Himachal Pradesh</i>													
Mandi	Mandi	Nov., to Dec. 2010	M W		300.00 NA	110.00 110	110.00 110	110.00 110	110.00 110	110.00 110	200.00 NA	200.00 NA	NA NA
<i>Kerala</i>													
Kozhikode	Koduvally	April, 2013	M W	4 to 8 4 to 8	920.00 NA	550.00 NA	NA 450	550.00 450	710.00 500	NA NA	650.00 NA	NA NA	NA NA
Palakkad	Elappally	April, 2013	M W	4 to 8 4 to 8	NA NA	NA NA	NA NA	400.00 300.00	400.00 200.00	NA NA	500.00 NA	NA NA	NA NA
<i>Madhya Pradesh</i>													
Hoshangabad	Sangarkhera	June, 2013	M W	8 8	150.00 NA	100.00 100	100.00 100	160.00 160	100.00 100	100.00 100.00	350.00 NA	350.00 NA	N.A. NA
Satna	Kotar	June, 2013	M W	8 8					—NA—				
Shyampur Kala	Vijaypur	June, 2013	M W	8 8	150.00 NA	NA NA	NA NA	NA NA	NA NA	50.00 NA	200.00 NA	200.00 NA	NA NA
<i>Odisha</i>													
Bhadrak	Chandbali	April, 2013	M W	8 8	150.00 NA	NA NA	NA NA	160.00 120	216.66 175	150.00 140	250.00 NA	180.00 NA	150.00 NA
Ganjam	Aska	April, 2013	M W	8 8	200.00 NA	200.00 100	200.00 150	200 150	203.33 120.00	200 100	350 NA	250 NA	300.00 NA
<i>Punjab</i>													
Ludhiana	Pakhowal	June, 2008	M W	8 8	NA NA	NA NA	90 NA	95 NA	NA NA	99.44 NA	NA NA	NA NA	NA NA
<i>Rajasthan</i>													
Barmer	Vishala	June, 2013	M W	8 8					—NA—				
Jalore	Panwa	June, 2013	M W	8 8	NA NA	NA NA	NA NA	NA NA	NA NA	200.00 NA	350.00 NA	300.00 NA	NA NA
<i>Tamil Nadu</i>													
Thanjavur#	Pulvathnam	May, 2013	M W	6 5	NA NA	300.00 NA	NA 108.33	300.00 104.17	278.54 108.33	NA NA	NA NA	NA NA	NA NA
Tirunelveli#	Malayakulam	May, 2013	M W	8 8	NA NA	NA NA	250 140	200 125	388.31 241.5	NA NA	NA NA	NA NA	NA NA
<i>Tripura</i>													
State average		Apr. 11 to March, 12	M W	8 8	238.00 NA	201.00 154	203 152	209 154	207 154	199.00 149	253.00 NA	235.00 NA	240.00 NA
<i>Uttar Pradesh*</i>													
Meerut	Ganeshpur	Jan., 2013	M W	8 8	205.00 NA	207.00 180	206 180	204 180	206 180.00	NA NA	320.00 NA	NA NA	NA NA
Auraiya	Auraiya	Jan., 2013	M W	8 8	150.00 NA	193.00 160.00	192.00 167	150 120	193 167	NA NA	300.00 NA	NA NA	NA NA
Chandauli	Chandauli	Jan., 2013	M W	8 8	150.00 NA	150.00 150.00	125 125	125.00 125.00	125.00 125.00	NA NA	271 NA	NA NA	NA NA

M-Man

W-Woman

N. A. —Not Available N. R. —Not Reported

*- Uttar Pradesh reports its district-wise average rural wage data rather than from selected centre/village.

- Tamil Nadu reports its district-wise average rural wage data rather than from selected centre/village.

B. PRICES

2. WHOLESALE PRICES OF CERTAIN AGRICULTURAL COMMODITIES AND ANIMAL HUSBANDRY

PRODUCTS AT SELECTED CENTRES IN INDIA

(Month-end Prices in Rupees)

Commodity	Variety	Unit	State	Centre	Sept.-13	Aug.-13	Sept.-12
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Wheat	PBW 343	Quintal	Punjab	Amritsar	1450	1450	1450
Wheat	Dara	Quintal	Uttar Pradesh	Chandausi	1500	1500	1450
Wheat	Lokvan	Quintal	Madhya Pradesh	Bhopal	1525	1514	1585
Jowar	—	Quintal	Maharashtra	Mumbai	2400	2350	2100
Gram	No III	Quintal	Madhya Pradesh	Sehore	3200	3380	3000
Maize	Yellow	Quintal	Uttar Pradesh	Kanpur	1340	—	1200
Gram Split	—	Quintal	Bihar	Patna	4650	4820	5460
Gram Split	—	Quintal	Maharashtra	Mumbai	5700	5700	5800
Arhar Split	—	Quintal	Bihar	Patna	6390	6350	5850
Arhar Split	—	Quintal	Maharashtra	Mumbai	6300	6250	6250
Arhar Split	—	Quintal	NCT of Delhi	Delhi	6150	6350	7000
Arhar Split	Sort II	Quintal	Tamil Nadu	Chennai	6420	6500	6100
Gur	—	Quintal	Maharashtra	Mumbai	3480	3400	3350
Gur	Sort II	Quintal	Tamil Nadu	Coimbatore	—	4000	3100
Gur	Balti	Quintal	Uttar Pradesh	Hapur	3340	3140	3050
Mustard Seed	Black (S)	Quintal	Uttar Pradesh	Kanpur	3200	3160	4190
Mustard Seed	Black	Quintal	West Bengal	Raniganj	3700	3600	4750
Mustard Seed	—	Quintal	West Bengal	Kolkata	3900	3900	4425
Linseed	Bada Dana	Quintal	Uttar Pradesh	Kanpur	4100	4160	4270
Linseed	Small	Quintal	Uttar Pradesh	Varanasi	3685	3640	3425
Cotton Seed	Mixed	Quintal	Tamil Nadu	Virudhunagar	1850	1850	1700
Cotton Seed	MCU5	Quintal	Tamil Nadu	Coimbatore	—	1550	1550
Castor Seed	—	Quintal	Andhra Pradesh	Hyderabad	3050	3300	3350
Sesamum Seed	White	Quintal	Uttar Pradesh	Varanasi	6600	6550	6600
Copra	FAQ	Quintal	Kerala	Alleppey	5825	5425	4050
Groundnut	Pods	Quintal	Tamil Nadu	Coimbatore	—	3800	3850
Groundnut	—	Quintal	Maharashtra	Mumbai	7000	7100	7900
Mustard Oil	—	15 Kg.	Uttar Pradesh	Kanpur	1164	1170	1328
Mustard Oil	Ordinary	15 Kg.	West Benaal	Kolkata	1215	1215	1395
Groundnut Oil	—	15 Kg.	Maharashtra	Mumbai	1350	1425	1688
Groundnut Oil	Ordinary	15 Kg.	Tamil Nadu	Chennai	1350	1380	1650
Linseed Oil	—	15 Kg.	Uttar Pradesh	Kanpur	1208	1245	1455
Castor Oil	—	15 Kg.	Andhra Pradesh	Hyderabad	1073	1133	1170
Sesamum Oil	—	15 Kg.	NCT of Delhi	Delhi	1400	1480	1450
Sesamum Oil	Ordinary	15 Kg.	Tamil Nadu	Chennai	2460	2400	2100
Coconut Oil	—	15 Kg.	Kerala	Cochin	1260	1185	885
Mustard Cake	—	Quintal	Uttar Pradesh	Kanpur	1650	1660	2150
Groundnut Cake	—	Quintal	Andhra Pradesh	Hyderabad	2929	3071	3893
Cotton/Kapas	NH44	Quintal	Andhra Pradesh	Nandyal	4700	4700	3700
Cotton/Kapas	LRA	Quintal	Tamil Nadu	Virudhunagar	—	—	—
Jute Raw	TD5	Quintal	West Benaal	Kolkata	2620	2450	2500
Jute Raw	W5	Quintal	West Benaal	Kolkata	2570	2430	2500

2. WHOLESALE PRICES OF CERTAIN AGRICULTURAL COMMODITIES AND ANIMAL HUSBANDRY
PRODUCTS AT SELECTED CENTRES IN INDIA—*Contd.*

(Month-end Prices in Rupees)

Commodity	Variety	Unit	State	Centre	Sep.-13	Aug.-13	Sep.-12
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Oranges	—	100 No	NCT of Delhi	Delhi	—	—	—
Oranges	Big	100 No	Tamil Nadu	Chennai	640	650	540
Oranges	Nagpuri	100 No	West Benaal	Kolkata	—	—	—
Banana	—	100 No.	NCT of Delhi	Delhi	208	208	167
Banana	Medium	100 No.	Tamil Nadu	Kodaikkanal	415	410	324
Cashewnuts	Raw	Quintal	Maharashtra	Mumbai	55000	53000	52500
Almonds	—	Quintal	Maharashtra	Mumbai	53000	48000	45000
Walnuts	—	Quintal	Maharashtra	Mumbai	66250	66000	52500
Kishmish	—	Quintal	Maharashtra	Mumbai	13100	12800	11000
Peas Green	—	Quintal	Maharashtra	Mumbai	4300	4100	3750
Tomatoes	Ripe	Quintal	Uttar Pradesh	Kanpur	1950	2240	890
Ladyfinger	—	Quintal	Tamil Nadu	Chennai	2300	2500	2000
Cauliflower	—	100 No.	Tamil Nadu	Chennai	1700	1600	1100
Potatoes	Red	Quintal	Bihar	Patna	980	990	1230
Potatoes	Desi	Quintal	West Bengal	Kolkata	800	810	1060
Potatoes	Sort I	Quintal	Tamil Nadu	Mettupalayam	—	2511	—
Onions	Pole	Quintal	Maharashtra	Nashik	4250	3500	500
Turmeric	Nadan	Quintal	Kerala	Cochin	100.00	9500	7850
Turmeric	Salam	Quintal	Tamil Nadu	Chennai	9400	9600	7300
Chillies	—	Quintal	Bihar	Patna	8000	7800	6800
Black Pepper	Nadan	Quintal	Kerala	Kozhikode	38500	39000	38500
Ginger	Dry	Quintal	Kerala	Cochin	15500	15500	11100
Cardamom	Major	Quintal	NCT of Delhi	Delhi	113000	112000	72500
Cardamom	Small	Quintal	West Bengal	Kolkata	95000	85000	100000
Milk	Cow	100 Liters	NCT of Delhi	Delhi	—	—	3600
Milk	Buffalo	100 Liters	West Bengal	Kolkata	3600	3600	3200
Ghee Deshi	Deshi No 1	Quintal	NCT of Delhi	Delhi	28681	29015	26947
Ghee Deshi	—	Quintal	Maharashtra	Mumbai	30500	30500	25250
Ghee Deshi	Desi	Quintal	Uttar Pradesh	Kanpur	30250	29400	28400
Fish	Rohu	Quintal	NCT of Delhi	Delhi	7000	9500	9000
Fish	Pomphrets	Quintal	Tamil Nadu	Chennai	28000	29500	23000
Eggs	Madras	1000 No,	West Bengal	Kolkata	3800	3750	4000
Tea	—	Quintal	Bihar	Patna	20000	20000	19675
Tea	Atti Kunna	Quintal	Tamil Nadu	Coimbatore	—	9000	—
Coffee	Plant-A	Quintal	Tamil Nadu	Coimbatore	—	26000	26000
Coffee	Rubusta	Quintal	Tamil Nadu	Coimbatore	—	14000	14000
Tobacco	Kampila	Quintal	Uttar Pradesh	Farukhabad	2825	2780	2500
Tobacco	Raisa	Quintal	Uttar Pradesh	Farukhabad	2700	2725	2400
Tobacco	Bidi Tobacco	Quintal	West Benaal	Kolkata	3700	3600	4000
Rubber	—	Quintal	Kerala	Kottayam	16200	17600	18200
Arecanut	Pheton	Quintal	Tamil Nadu	Chennai	29000	28900	28000

3. MONTH-END WHOLESALE PRICES OF SOME IMPORTANT AGRICULTURAL COMMODITIES IN INTERNATIONAL
MARKETS DURING YEAR, 2013

Commodity	Variety	Country	Centre	Unit	Jan.	Feb.	Mar.	Apr.	May	June	Jul.	Aug.	Sep.
Cardamom	Guatemala Bold Green	U.K.	—	Dollar/M.T.	16500.00	16500.00	16500.00	17000.00	14250.00	14250.00	14250.00	14250.00	14250.00
				Rs./Qtl.	88572.00	89875.50	89743.50	92174.00	80341.50	85770.75	84018.00	96030.75	87965.25
Cashew Kernels	Spot U.K. 320s	U.K.	—	Dollar/lbs	3.60	3.60	3.66	3.64	3.55	3.56	3.55	3.50	3.47
				Rs./Qtl.	42591.86	43218.68	43874.45	43498.32	44112.84	47226.52	46131.48	51984.65	47210.36
	Spot U.K. 320s	U.K.	—	Dollar/M.T.	7915.09	7898.35	8056.22	8024.08	7861.23	7844.30	7869.32	7719.15	7633.83
				Rs./Qtl.	42488.20	43022.31	43817.78	43506.56	44321.61	47214.84	46397.51	52019.35	47123.63
Castor Oil	Any Origin ex tank Rotterdam	Netherlands	—	Dollar/M.T.	1690.00	1650.00	1650.00	1600.00	1500.00	1510.00	1480.00	1420.00	1440.00
				Rs./Qtl.	9071.92	8987.55	8974.35	8675.20	8457.00	9088.69	8726.08	9569.38	8889.12
Celery Seed	ASTA cif	India	—	Dollar/M.T.	1500.00	1500.00	1500.00	1500.00	1500.00	1500.00	1500.00	1500.00	1500.00
				Rs./Qtl.	8052.00	8170.50	8158.50	8133.00	8457.00	9028.50	8844.00	10108.50	9259.50
Chillies	Birds eye 2005 crop	Africa	—	Dollar/M.T.	5500.00	4250.00	4250.00	4100.00	4100.00	4100.00	4100.00	4100.00	4100.00
				Rs./Qtl.	26840.00	23149.75	23115.75	22230.20	23115.80	24677.90	24173.60	27629.90	25309.30
Cinnamon Bark		Madagascar	—	Dollar/M.T.	1100.00	1100.00	1100.00	1100.00	1100.00	1100.00	1100.00	1100.00	1100.00
				Rs./Qtl.	5904.80	5991.70	5982.90	5964.20	6201.80	6620.90	6485.60	7412.90	6790.30
Cloves	Singapore	Madagascar	—	Dollar/M.T.	9500.00	9500.00	9500.00	12000.00	12000.00	11850.00	13500.00	13500.00	12800.00
				Rs./Qtl.	50996.00	51746.50	51670.50	65064.00	67656.00	71325.15	79596.00	90976.50	79014.40
Coconut Oil	Crude Phillipine/Indonesia	Netherlands	—	Dollar/M.T.	815.00	850.00	805.00	800.00	850.00	890.00	850.00	930.00	990.00
				Rs./Qtl.	4374.92	4629.95	4378.40	4337.60	4792.30	5356.91	5011.60	6267.27	6111.27
Copra	Phillipines cif Rotterdam	Phillipine	—	Dollar/M.T.	538.00	530.00	505.00	476.00	527.00	559.00	546.00	578.00	616.00
				Rs./Qtl.	2887.98	2886.91	2746.70	2580.87	2971.23	3364.62	3219.22	3895.14	3802.57
Corriander		India	—	Dollar/M.T.	1150.00	1150.00	1150.00	1150.00	1150.00	1150.00	1150.00	1150.00	1150.00
				Rs./Qtl.	6173.20	6264.05	6254.85	6235.30	6483.70	6921.85	6780.40	7749.85	7098.95
Cummin Seed		India	—	Dollar/M.T.	2889.00	2889.00	2889.00	289.00	2889.00	2889.00	2889.00	2889.00	2889.00
				Rs./Qtl.	15508.15	15736.38	15713.27	15664.16	16288.18	17388.89	17033.54	19468.97	17833.80
Fennel seed		India	—	Dollar/M.T.	2600.00	2600.00	2600.00	2600.00	2600.00	2600.00	2600.00	2600.00	2600.00
				Rs./Qtl.	13956.80	14162.20	14141.40	14097.20	14658.80	15649.40	15329.60	17521.40	16049.80
Ginger	Split	Nigeria	—	Dollar/M.T.	2400.00	2400.00	2400.00	2400.00	1810.00	2005.00	2300.00	2300.00	2300.00
				Rs./Qtl.	12883.20	13072.80	13053.60	13012.80	10204.78	12068.10	13560.80	15499.70	14197.90
Groundnut kernels	US 2005, 40/50	European Ports	—	Dollar/M.T.	1275.00	1350.00			1350.00	1380.00	1400.00	1310.00	1350.00
				Rs./Qtl.	6844.20	7353.45	—	—	7611.30	8306.22	8254.40	8828.09	8333.55
Groundnut Oil	Crude Any Origin cif Rotterdam	U.K.	—	Dollar/M.T.	2200.00						1700.00	1700.00	1700.00
				Rs./Qtl.	11809.60	—	—	—	—	—	10023.20	11456.30	10494.10
Lentils	Turkish Red Split Crop 1+1 water	U.K.	—	Pound/M.T.	522.72	655.20	660.98	647.80	656.64	655.38	650.12	644.89	623.54
				Rs./Qtl.	4428.48	5446.68	5438.54	5422.09	6537.91	6019.01	5895.94	6739.10	6173.05
Maize		U.S.A	Chicago	C/56 lbs.	720.75	700.50	735.25	639.50	665.00	664.50	508.25	504.25	454.75
				Rs./Qtl.	1520.51	1499.54	1571.62	1362.68	1473.46	1571.85	1177.68	1335.47	1103.22
Oats		Canada	Winnipeg	Dollar/M.T.	359.83	384.62	406.44	401.94	366.25	405.76	362.84	389.94	319.38
				Rs./Qtl.	1931.57	2095.03	2210.63	2179.32	2064.92	2442.27	2139.30	2027.81	1971.53
Palm Kernal Oil	Crude Malaysia/Indonesia	Netherlands	—	Dollar/M.T.	795.00	855.00	815.00	840.00	840.00	840.00	830.00	905.00	895.00
				Rs./Qtl.	4267.56	4657.19	4432.79	4554.48	4735.92	5055.96	4893.68	6098.80	5524.84
Palm Oil	Crude Malaysian/Sumatra	Netherlands	—	Dollar/M.T.	855.00	860.00	850.00	830.00	860.00	855.00	825.00	850.00	820.00
				Rs./Qtl.	4589.64	4684.42	4623.15	4500.26	4848.68	5146.25	4864.20	5728.15	5061.86

3. MONTH-END WHOLESALE PRICES OF SOME IMPORTANT AGRICULTURAL COMMODITIES IN INTERNATIONAL
MARKETS DURING YEAR, 2013—Contd.

Commodity	Variety	Country	Centre	Unit	Jan.	Feb.	Mar.	Apr.	May	June	Jul.	Aug.	Sept.
Pepper (Black)	Sarawak Black label	Malaysia	—	Dollar/M.T Rs./Qtl.	— —	7300.00 39763.10	—	—	—	—	—	—	—
Rapeseed	Canola	Canada	Winni- peg	Can Dollar/M.T	605.80 3244.06	644.20 3448.40	638.00 3415.21	637.60 3388.84	640.50 3505.46	613.10 3521.65	505.20 2895.81	527.40 3372.20	484.90 2903.10
	U.K. delivered rapeseed, delivered	U.K.	—	Pound/M.T. Rs./Qtl.	339.00 3210.89	389.00 3233.76	393.00 3233.60	394.00 3297.78	375.00 3219.75	330.00 3030.72	318.00 2883.94	320.00 3344.00	290.00 2871.00
Rapeseed Oil	Refined bleached and deodorised	U.K.	—	Pound/M.T. Rs./Qtl.	871.00 7379.11	908.00 7548.20	867.00 7133.68	819.00 6855.03	855.00 7341.03	826.00 7585.98	731.00 6629.44	752.00 7858.40	693.00 6860.70
Soyabean Meal	U.K. produced 49% oil & protein	U.K.	—	Pound/M.T. Rs./Qtl.	351.99 2973.67	379.00 3150.63	376.00 3093.73	—	409.00 3511.67	395.00 3627.68	422.00 3827.12	426.99 4451.70	393.00 3890.70
Soyabean Oil		U.S.A.	—	C/lbs Rs./Qtl.	52.03 6155.71	52.07 6251.10	50.82 6092.08	49.18 5877.05	48.63 6042.84	46.63 6185.88	44.26 5751.49	44.31 6581.26	41.82 6589.73
	Refined bleached and deodorised	U.K.	—	Pound/M.T. Rs./Qtl.	826.00 6997.87	849.00 7057.74	839.00 6903.29	768.00 6428.16	774.00 6645.56	716.00 6575.74	720.00 6259.68	758.00 7921.10	704.00 6969.60
Soyabeans	U.S. No. 2 yellow	Nether- lands	Chicago	Dollar/M.T. Rs./Qtl	596.70 3203.09	594.10 3236.06	580.10 3155.16	569.20 3086.20	510.10 2875.94	513.00 3087.75	511.50 3015.80	561.70 3785.30	573.70 3541.45
		U.S.A.	—	C/60 labs Rs./Qtl	1437.00 2830.97	148.275 2964.09	1453.75 2901.85	1345.25 2676.88	1501.75 3107.34	1534.25 3389.12	1392.50 3013.14	1433.00 3544.11	1321.75 2994.41
Sunflower Seed Oil	Refined bleached and deodorised	U.K.	—	Pound/M.T. Rs./Qtl	983.00 8327.98	1018.00 8462.63	963.00 7923.56	934.00 7817.58	845.00 7255.17	787.00 7227.81	843.00 7645.17	829.00 8663.05	731.00 7236.90
Tallow	High grade delivered	U.K.	Lon- don	Pound/M.T. Rs./Qtl	550.00 4659.60	460.00 3823.98	440.00 3620.32	440.00 3682.80	440.00 3777.84	440.00 4049.96	445.00 4035.71	445.00 4650.25	445.00 4405.50
Turmeric	Madras finger spot/cif	India	—	Dollar/M.T. Rs./Qtl	850.00 4562.80	850.00 4629.95	850.00 4623.15	850.00 4608.70	850.00 4792.30	850.00 5116.15	850.00 5011.60	850.00 5728.15	850.00 5247.05
Walnuts	Indian light halves	U.K.	—	Pound/M.T. Rs./Qtl	7500.00 63540.00	7500.00 62347.50	7950.00 65412.60	7750.00 64867.50	7980.00 68516.28	7980.00 73288.32	7800.00 70738.20	7800.00 81510.00	7800.00 77220.00
Wheat		U.S.A.	Chic- ago	C/60 lbs Rs./Qtl	774.75 1526.30	738.50 1476.30	736.75 1470.64	691.75 1376.50	702.75 1454.09	667.00 1473.38	653.20 1413.52	646.50 1598.93	670.50 1519.01

Source : Public Ledger.

Exchange Rate

	Jan.	Feb.	Mar.	Apr.	May	June	Jul	Aug.	Sep.
US Dollar	53.68	54.47	54.39	54.22	56.38	60.19	58.96	67.39	61.73
CAN Dollar	53.55	53.53	53.53	53.15	54.73	57.44	57.32	63.94	59.87
UK Pound	84.72	83.13	82.28	83.70	85.86	91.84	90.69	104.50	99.00

C. CROP PRODUCTION

4. SOWING AND HARVESTING OPERATIONS NORMALLY IN PROGRESS DURING THE MONTH OF NOVEMBER, 2013

State	Sowing	Harvesting
(1)	(2)	(3)
Andhra Pradesh	Paddy, Jowar, (in some areas), Bengal, gram, horsegram, condiment and spices and potato.	Kharif paddy, ragi, other kharif cereals, ginger and groundnut.
Assam	Rabi paddy, gram, mustard, winter vegetables and potato.	Kharif paddy, jute, tea and winter potato.
Bihar	Wheat, barley, gram, rapeseed & mustard, sweet Potato.	Kharif paddy and potato.
Gujarat	Paddy, Wheat, Gram, Pulses and Potato.	Paddy, Kharif, Jowar, groundnut, bajra and Cotton.
Himachal Pradesh	Wheat, barley and gram.	Winter paddy, rabi kharif, sugarcane, ginger (dry), chillies (dry), tobacco, cotton, turmeric and sannhemp.
Jammu & Kashmir	Wheat (in Kashmir) barley, linseed and rapeseed and mustard.	Maize (in Jammu).
Karnataka	Bengal gram; potato and Rabi paddy.	Kharif paddy, jowar, bajra, ragi, groundnut and sweet potato.
Kerala	Paddy, Pulses and sweet potato.	Kharif paddy, sugarcane, ginger and tapioca.
Madhya Pradesh	Wheat, barley, gram, rabi pulses, potato, rapeseed & mustard and castorseed.	Kharif paddy, jowar, bajra, ragi, kharif, pulses, potato, chillies, tobacco, cotton, sweet potato and turmeric.
Maharashtra	Wheat, gram, barley, jowar and pulses.	Kharif Paddy, jowar, groundnut, bajra, cotton and sugarcane.
Manipur		Winter paddy, tur, groundnut, sesamum, sweet potato and turmeric.
Orissa	Wheat, sugarcane, tobacco, mustard, gram and linseed.	Kharif paddy, groundnut, sugarcane, cotton and sannhemp.
Punjab	Wheat, barley, gram and linseed.	Jowar, bajra, maize, cotton and sugar cane.
Rajasthan	Wheat, barley, gram, potato, tobacco, rapeseed and mustard and linseed.	Paddy, jowar, bajra, sugarcane and cotton.
Tamil Nadu	Rabi paddy, jowar, cotton, tobacco, horsegram, chillies and rapeseed and mustard.	Kharif paddy, kharif jowar, cumbu ragi, maize, groundnut (un irrigated), cotton, varagu, samai, tapioca and ginger.
Tripura	Pulses, potato and rapeseed and mustard.	Winter rice.
Uttar Pradesh	Wheat, barley, gram, linseed and cotton.	Kharif paddy, jowar, bajra, sugarcane, groundnut, cotton, tobacco and sannhemp.
West Bengal	Wheat paddy, wheat, barley, linseed, rapeseed and mustard and potato.	Winter paddy, sugarcane, sesamum and cotton.
Delhi	Wheat, barley, gram, pulses, tobacco, linseed and rapeseed and mustard.	Jowar, kharif pulses, sugarcane and sweet potato.

METRIC WEIGHTS AND MEASURES

SIMPLE CONVERSION TABLES

I. WEIGHTS

**Tons to metric
Tonnes**

Tons	..	..	1	2	3	4	5	6	7	8	9	10
Metric tonnes	..	..	1.02	2.03	3.05	4.07	5.08	6.10	7.11	8.13	9.14	10.16

**Pounds (av.) to
Kilograms**

Pounds	..	..	1	2	3	4	5	6	7	8	9	10
Kilograms	..	..	0.45	0.91	1.36	1.81	2.27	2.72	3.18	3.63	4.08	4.54

Tolas to grams

Tolas	..	..	1	2	3	4	5	6	7	8	9	10
Grams	..	..	11.66	23.33	34.99	46.66	58.32	69.98	81.65	93.31	104.97	116.64

Seers to Kilograms

Seers	..	..	1	2	3	4	5	6	7	8	9	10
Kilograms	..	..	0.93	1.87	2.80	3.73	4.67	5.60	6.53	7.46	8.40	9.33

Maunds to Quintals

Maunds	..	..	1	2	3	4	5	6	7	8	9	10
Quintals	..	..	0.37	0.75	1.12	1.49	1.87	2.24	2.61	2.99	3.36	3.73

II. LENGTHS

Miles to Kilometres

Miles	..	..	1	2	3	4	5	6	7	8	9	10
Kilometres	..	..	1.61	3.22	4.83	6.44	8.05	9.66	11.27	12.87	14.47	16.09

Yards to Metres

Yards	..	..	1	2	3	4	5	6	7	8	9	10
Metres	..	..	0.91	1.83	2.74	3.66	4.57	5.49	6.40	7.32	8.23	9.14

Inches to Millimetres

Inches	..	..	1	2	3	4	5	6	7	8	9	10	11	12
Millimetres	..	..	25.40	50.80	76.20	101.60	127.00	152.40	177.80	203.20	228.60	254.00	279.40	304.80

III. AREA

Acres to Hectares

Acres	..	..	1	2	3	4	5	6	7	8	9	10
Hectares	..	..	0.40	0.81	1.21	1.61	2.02	2.43	2.83	3.24	3.64	4.04

**Square Yards to
Square Metres**

Square Yards	..	..	1	2	3	4	5	6	7	8	9	10
Square Metres	..	..	0.84	1.67	2.51	3.34	4.18	5.02	5.85	6.69	7.53	8.36

IV. CAPACITY

**Gallons (Imperial)
to Litres**

Gallons	..	..	1	2	3	4	5	6	7	8	9	10
Litres	..	..	4.55	9.09	13.64	15.14	22.73	27.28	31.82	36.37	40.91	45.44

LIST OF PUBLICATIONS

Journal

Agricultural Situation in India (Monthly)

Periodicals

Agricultural Prices in India

District-wise Area and Production of Principal Crops in India

Agricultural Wages in India

Cost of Cultivation of Principal Crops

Year Book of Agro-Economic Research Studies

Land Use Statistics at a Glance

Farm Harvest Prices in Principal Crops in India

Agricultural Statistics at a Glance

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