AGRICULTURAL SITUATION IN INDIA

AUGUST, 2012

PUBLICATION DIVISION
DIRECTORATE OF ECONOMICS AND STATISTICS
DEPARTMENT OF AGRICULTURE AND CO-OPERATION
MINISTRY OF AGRICULTURE
GOVERNMENT OF INDIA

Publication Division

DIRECTORATE OF ECONOMICS AND STATISTICS
DEPARTMENT OF AGRICULTURE AND CO-OPERATION
MINISTRY OF AGRICULTURE
GOVERNMENT OF INDIA
C-1, HUTMENTS, DALHAUSIE ROAD,
NEW DELHI-110001
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	Inland	Foreign
Single Copy	**: ₹ 40.00**	**£ 2.9 or $ 4.5**
Annual	**: ₹ 400.00**	**£ 29 or $ 45**

Available from :

The Controller of Publications,
Ministry of Urban Development,
Deptt. of Publications,
Publications Complex (Behind Old Secretariat),
Civil Lines, Delhi-110 054.
Phone : 23817823, 23817640, 23819689

Agricultural Situation in India

VOL. LXIX **AUGUST 2012** **No. 5**

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PART I

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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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Articles on the State of Indian Agriculture and allied sectors are accepted for publication in the Directorate of Economics & Statistics, Department of Agriculture & Cooperation's monthly Journal "Agricultural Situation in India". The Journal intends to provide a forum for scholarly work and also to promote technical competence for research in agricultural and allied subjects. The articles, not exceeding five thousand words, may be sent in duplicate, typed in double space on one side of fullscape paper in Times New Roman font size 12, addressed to the Economic & Statistical Adviser, Room No.145, Krishi Bhawan, New Delhi-11 0001, alongwith a declaration by the author(s) that the article has neither been published nor submitted for publication elsewhere. The author(s) should furnish their e-mail address, Phone No. and their permanent address only on the forwarding letter so as to maintain anonymity of the author while seeking comments of the referees on the suitability of the article for publication.

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PART II

STATISTICAL TABLES

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.

ISSN 0002—167
Regn. No. : 840

P. Agri. 21-8-2012
600

LIST OF PUBLICATIONS

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Agricultural Situation in India (Monthly)

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Land Use Statistics at a Glance

District-wise Area and Production of Principal Crops in India

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Farm Harvest Prices of Principal Crops in India

Agricultural Statistics at a Glance

Copies are available from : The Controller of Publications, Civil Lines, Delhi-110054. (Phone 23817640)

PRINTED BY THE MANAGER, GOVERNMENT OF INDIA PRESS, RING ROAD, MAYAPURI, NEW DELHI-110064
AND PUBLISHED BY THE CONTROLLER OF PUBLICATIONS, DELHI-110054—2013.

A. General Survey

(i) Trends in Foodgrain Prices

During the month of July, 2012 the All India Index Number of Wholesale Price (2004-05=100) of Foodgrains increased by 9.72 per cent from 193.4 in June, 2012 to 212.2 in July, 2012.

Similarly, the Wholesale Price Index Number of Cereals showed an increase of 2.31 per cent from 186.4 to 190.7 and Pulses showed an increase of 8.10 per cent from 225.9 to 244.2.

The Wholesale Price Index Number of Wheat and Rice increased by 1.11 per cent and 3.03 per cent respectively during the same period.

(ii) Weather, Rainfall and Reservoir situation during August, 2012

- Cumulative Monsoon Rainfall for the country as a whole during the period 1st June to 30th August. 2012 is 12per cent less than LP A. Rainfall in the four broad geographical divisions of the country during the above period was (-) 14 per cent in North West India, (-) 10 per cent in Central India, 12per cent in South Peninsula and (-) 15per cent in East & North East India.
- Out of a total of 36 meteorological subdivisions, 22 subdivisions constituting 68 per cent of the total area of the country received excess/normal rainfall and the remaining 14 subdivisions constituting 32per cent of the total area of the country received deficient/scanty rainfall.
- Central Water Commission monitors 84 major reservoirs in the country which have a total live capacity of 154.42 BCM at Full Reservoir Level (FRL). Current live storage in these reservoirs as on 30th August, 2012 was 94.04 BCM as against 114.08 BCM on 30.08.2011(1ast year) and 93.91 BCM of normal storage (average storage of the last 10 years). Current year's storage is 82 per cent of the last year's and 100 per cent of the normal storage. Major States reporting lower than normal storage are Himachal Pradesh, Punjab, Jharkhand, West Bengal, Tripura, Andhra Pradesh, Karnataka, Kerala, Maharashtra and Tamil Nadu.
- 954.31 lakh ha. area had been sown under various Kharif crops upto 31.08.2012 as compared to average sown area of 960.92 lakh ha. upto the corresponding period of previous years. Area coverage is higher by 15.3 lakh ha. in Rice, 12.4 lakh ha. in Soyabean, 5.6 lakh ha. in Cotton, 6.2 lakh ha. in Sugarcane and 1.8 lakh ha. in Urad. Major decline (compared to average area) has been reported under Bajra (-18.9 lakh ha.), Jowar (-5.5 lakh ha.), Pulses (-3.6 lakh ha.), Groundnut (-9.7Iakh ha.), Sunflower (-2.6 lakh ha.) and Sesamum (-1.2 lakh ha.).
- A statement indicating comparative position of area coverage under major Kharif crops during 2012-13 (upto 31.08.2012) and the corresponding period of last year is enclosed.

ALL INDIA CROP SITUATION - KHARIF (2012-13) AS ON 31-08-2012

(in lakh hectares)

Crop Name	Average Area for whole Kharif Season	Average Area as on date	Area sown reported % of Average for			Absolute Change.over (+/–)	
			This Year 2012	whole season	Last Year 2011	Average as on date	Last Year
Rice	391.10	331.85	347.10	319.2	364.61	15.3	–17.5
Jowar	32.88	29.02	23.54	71.6	25.85	–5.5	–2.3
Bajra	92.10	77.47	58.59	63.2	78.60	–18.9	–20.0
Maize	70.64	71.91	71.91	101.8	72.69	0.0	–0.8
Total Coarse Cereals	218.58	196.77	167.87	76.8	193.37	–28.9	–25.5
Total Cereals	609.68	528.62	514.97	84.5	557.98	–13.7	–43.0
Tur	37.00	37.67	36.13	97.7	37.40	–1.5	–1.3
Urad	23.11	21.25	23.02	99.6	21.49	1.8	1.5

ALL INDIA CROP SITUATION - KHARIF (2012-13) AS ON 31-08-2012

(in lakh hectares)

Crop Name	Average Area for whole Kharif Season	Average Area as on date	Area sown reported			Absolute Change over (+/–)	
				% of Average for			
			This Year 2012	whole season	Last Year 2011	Average as on date	Last Year
Moong	26.29	23.40	19.35	9.2	22.11	–4.1	–2.8
Others	23.36	18.99	19.20	82.2	23.18	0.2	–4.0
Total Pulses	109.75	101.31	97.70	89.0	104.18	–3.6	–6.5
Total Foodgrains	719.43	629.93	612.67	85.2	662.16	–17.3	–49.5
Groundnut	49.94	46.63	36.97	74.0	42.12	–9.7	–5.1
Soyabean	92.11	94.56	106.94	116.1	103.12	12.4	3.8
Sunflower	6.33	4.26	1.68	26.5	2.39	–2.6	–0.7
Sesamum	18.67	14.16	12.92	69..2	14.63	–1.2	–1.7
Niger	4.03	1.83	1.59	39.3	1.46	–0.2	0.1
Castor	7.79	6.93	7.06	90.5	11.13	0.1	–4.1
Total Oilseed	178.89	168.36	167.15	93.4	174.86	–1.2	–7.7
Cotton	98.66	106.91	112.83	114.4	118.37	5.9	–5.5
Sugarcane	47.36	46.72	52.88	111.7	50.63	6.2	2.3
Jute	7.96	9.00	8.78	110.3	9.19	–0.2	–0.4
All.-Crops	1052.30	960.92	954.31	90.7	1015.21	–6.6	–60.9

Source: Crops and TMOP Divisions DAC.

All India production of foodgrains : As per the 4th advance estimates released by Ministry of Agriculture on 17-7-2012, production of foodgrains during 2011-12 is estimated at 257.44 million tonnes compared to 244.78 million tonnes in 2010-11.

Procurement: Procurement of rice as on 2nd July, 2012 (Kharif Marketing Season 2011-12) at 34.28 million tonnes represents an increase of 11.44 per cent compared to the corresponding date last year. Wheat procurement during Rabi Marketing Season 2012-13 is 37.85 million tonnes as compared to 27.85 million tonnes during the corresponding period last year.

TABLE 1— PROCUREMENT IN MILLION TONNES

	2009-10	2010-11	2011-12	2012-13
Rice (Oct.-Sept.)	32.03	34.20	34.57*	N.A.
Wheat (Apr.-Mar.)	25.38	22.51	28.34	38.11*
Total	**57.41**	**56.71**	**62.91**	**38.11**

* Position as on, 25-7-2012.

Off-take: Off-take of rice during the month of June, 2012 was 26.271akh tonnes. This comprises 21.90 lakh tonnes under TPDS and 4.37 lakh tonnes under other schemes. In respect of wheat, the total off take was 22.96 lakh tonnes comprising-of 20.11lakh tonnes under TPDS and 2.85 lakh tonnes under other schemes.

Stocks: Stocks of food-grains (rice and wheat) held by FCI as on July 1, 2012 were 80.52 million tonnes, which is higher by 25.8 per cent over the level of 64.01 million tonnes as on July 1, 2011.

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

	Off-take			Stocks	
	2010-11	2011-12	2012-13(P)	July, 2011	July 2012
Rice	29.93	32.12	7.50	26.86	30.71
Wheat	23.07	24.26	5.95	37.15	49.81
Total	**53.00**	**56.38**	**13.45**	**64.01**	**80.52**

P=Provisional figures up to June, 2012.

Growth of Economy

As per the latest estimates of the Central Statistics Office (CSO), the growth in real Gross Domestic Product (GDP) is placed at 5.5 per cent in the first quarter of 2012-13 with agriculture, industry and services registering growth rates of 2.9 per cent, 3.6 per cent and 6.9 per cent respectively. As per the Revised Estimates (RE), the growth in GDP at factor cost at constant (2004-05) prices was estimated at 6.5 per cent in 2011-12 as compared to 8.4 per cent in 2010-11 (Quick Estimate). At disaggregated level, this (RE 2011-12) comprises growth of 2.8 per cent in agriculture and allied activities, 3.4 per cent in industry and 8.9 per cent in services as compared to a growth of 7.0 per cent, 7.2 per cent and 9.3 per cent respectively during 2010-11.

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

(at 2004-05 Prices)

Industry	Growth			Percentage Share in GDP		
	2009-10	2010-11 QE	2011-12 RE	2009-10	2010-11 QE	2011-12 RE
1. Agriculture, forestry and fishing	1.0	7.0	2.8	14.7	14.5	14.0
2. Industry	**8.4**	**7.2**	**3.4**	**28.1**	**27.8**	**27.0**
a. Mining and quarrying	6.3	5.0	–0.9	2.3	2.2	2.1
b. Manufacturing	9.7	7.6	2.5	16.0	15.8	15.3
c. Electricity, gas and water supply	6.3	3.0	7.9	2.0	1.9	1.9
d. Construction	7.0	8.0	5.3	7.9	7.9	7.8
3. Services	**10.5**	**9.3**	**8.9**	**57.2**	**57.7**	**59.0**
a. Trade, hotels, transport and communication	10.3	11.1	9.9	26.6	27.2	28.1
b. Financing, insurance, real estate and business services	9.4	10.4	9.6	17.1	17.4	17.9
c. Community, social and personal services	12.0	4.5	5.8	13.5	13.1	13.0
4. GDP at factor cost	**8.4**	**8.4**	**6.5**	**100.0**	**100.0**	**100.0**

(QE): Quick Estimates; (RE): Revised Estimates

TABLE 4—QUARTERLY ESTIMATE OF GDP

(Year-on-year in per cent)

	2010-11				2011-12			2012-13	
Industry	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
1. **Agriculture, forestry & fishing**	3.1	4.9	11.0	7.5	3.7	3.1	2.8	1.7	2.9
Industry	8.3	5.7	7.6	7.0	5.6	3.7	2.5	1.9	3.6
2. Mining & quarrying	6.9	7.3	6.1	0.6	–0.2	–5.4	–2.8	4.3	0.1
3. Manufacturing	9.1	6.1	7.8	7.3	7.3	2.9	0.6	-0.3	0.2
4. Electricity, gas & water supply	2.9	0.3	3.8	5.1	8.0	9.8	9.0	4.9	6.3
5. Construction	8.4	6.0	8.7	8.9	3.5	6.3	6.6	4.8	10.9
Services	10.0	9.1	7.7	10.6	10.2	8.8	8.9	7.9	6.9
6. Trade, hotels, transport & communication	12.6	10.6	9.7	11.6	13.8	9.5	10.0	7.0	4.0
7. Financing, insurance, real estate & bus. Services	10.0	10.4	11.2	10.0	9.4	9.9	9.1	10.0	10.8
8. Community, social & personal services	4.4	4.5	-0.8	9.5	3.2	6.1	6.4	7.1	7.9
9. CDP at factor cost (total 1 to 8)	8.5	7.6	8.2	9.2	8.0	6.7	6.1	5.3	5.5

Source: CSO

B. Articles

Identification of Predominant Farming Systems and their Economics in Telangana Region of Andhra Pradesh

V. Rajendra Prasad, M. Malla Reddy And M. V. Ramana*

Introduction

Telangana is one of the important geopolitical regions in Andhra Pradesh (A.P.). There are ten districts in Telangana region. They are Khammam, Nalgonda, Mahabubnagar, Medak, Nizamabad, Adilabad, Karimnagar and Warangal. Telangana was divided into three agro climatic zones. The details about the geographical area, cropped area, irrigation facility and important crops grown in each zone (www.angrau.net) are furnished here under.

A. Northern Telangana Zone

This zone has a total geographical area of 7.43 m. ha. covering the districts of Adilabad, Karimnagar and Nizamabad. The climate is typically tropical rainy. The mean annual precipitation ranges from 900 to 1150 mm with 82 per cent of rainfall from south west monsoon. The net sown area is 2.21 m. ha. of which 0.67 m. ha. is irrigated representing 30.3 per cent of the net sown area. The major crops grown in the zone are rice, sugarcane, jowar, pulses, maize, cotton, groundnut, turmeric and chillies and others. Cropping intensity is 110 per cent. Wells are the main source of irrigation followed by canals. Red chalka soils are predominant.

II. Southern Telangana Zone

The zone comprises of the districts of Rangareddy, Mahabubnagar (except the southern border), Nalgonda (except south east border), north western part of Warangal and southern part of Medak districts. The zone covers an area of 4.0 m. ha. The soils of the zone are mainly red sandy, red earths and medium black soils. The zone receives an annual normal rainfall of 809 (700—900) mm. About 77 per cent of total rainfall is received during south west monsoon only. 14.35 per cent of the 1.68 m. ha. of net sown area is under irrigation. The principal crops grown in the zone are jowar, castor, rice, groundnut, bajra, redgram, horsegram, ragi, greengram, maize and seasmum. It is the castor belt of A.P.

III. Central Telangana Zone

The zone comprises of the districts of Medak, Warangal and Khammam. The zone covers an area of 3.86 m. ha. The soils of the zone are mainly red sandy loams, very red soils and deep black soils. The zone receives an annual normal rainfall of 996 (868—1124) mm. About 88.03 per cent of total rainfall is received during south west monsoon only. The net sown area is 1.25 m. ha. of which 0.51 m. ha. is irrigated representing 40.68 per cent of the net sown area. The principal crops grown in the zone are Paddy, Cotton, Red gram, Maize, Sugarcane, Black gram and Green gram. It is the important Cotton growing zone of Telangana.

The government of Andhra Pradesh aimed at increasing crop productivity by developing farming situation based production plans, implementation of crop diversification programme and assist the farmers in the event of natural calamities like droughts, floods and cyclones for providing relief and inputs for alternate cropping programme. Knowledge of the methodologies to evaluate alternate cropping systems in various conditions and also review of such work is very much essential as it serves as a ready reckoner for decision making under different situations and implementation of strategies in future. (Socio economic survey of Andhra Pradesh, 2008-09).

To meet the multiple objectives of poverty reduction, food security, competitiveness and sustainability, several researchers have recommended the farming systems approach to research and development. A farming system is the result of complex interactions among a number of inter-dependent components, where an individual farmer allocates certain quantities and qualities of four factors of production, namely land, labour, capital and management to which he has access (Mahapatra, 1994). Farming systems research is considered a powerful tool for natural and human resource management in developing countries such as India. This is a multidisciplinary whole-farm approach and very effective in solving the problems of small and marginal farmers. The approach aims at increasing income and employment from small-holdings by integrating various farm enterprises and recycling crop residues and by-products within the farm itself (Behera and Mahapatra, 1999; Singh *et al*., 2006). As a first step identification of the existing farming systems and their components under practice in the region is necessary. Hence a study has been undertaken to identify the predominant farming systems in Telangana region of Andhra Pradesh.

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DATA AND METHODOLOGY

All Agro climatic zones (NARP) of the Telangana region of Andhra Pradesh were formed the basis of the study. 30 per cent of the districts from each Agro climatic zone i.e., one district from each zone was selected for the quick survey of farming systems of Telangana region of Andhra Pradesh. The details are given below :

S. No.	Name of the agro climatic zone	Sampled districts
1.	Southern Telangana Zone (STZ)	Nalgonda
2.	Central Telangana Zone (CTZ)	Warangal
3.	Northern Telangana Zone (NTZ)	Karimnagar

From every district four representative mandals and three village Panchayat from each mandaI were selected by adopting stratified four stage random sampling. Six farmers from each village panchayat consisting two each marginal, small and two farmers from among medium and large size category were interviewed on random basis to fill up the pre-tested and designed questionnaire. Farming systems were identified based on corresponding higher gross return from the different activities. Zone wise results of the quick survey were presented below.

RESULTS AND DISCUSSION

Identification of Farming Systems in Southern Telangana Zone (STZ)

Four types of farming systems followed in the area based on a major system were (i) Cereal based farming systems (ii) Cotton based farming systems (iii) Livestock based farming systems and (iv) Horticulture based farming systems. The data were collected based on the above four farming systems and are depicted in Table 1.1. In all 17 sub-farming systems were identified. The maximum number of sub-farming systems were under cereal based farming systems (8), followed by cotton based farming system (5), horticulture based farming systems (3) and livestock based farming systems (1). Based on the adoption of sub-farming systems by more number of households, the most preferred farming systems were Paddy+Paddy+Livestock (19 Households) and Paddy+Paddy (8 Households).

Since the study area is known for its principal crops rice and cotton, the maximum sub-farming systems were either paddy or cotton based or involved paddy or cotton in the farming system. The number of farm households following paddy or cotton based system was also found to be more in the study area.

Different activities of farming systems were presented size category-wise and also their per cent in the descending order. Cereal based farming system was predominant in terms of area occupied in Nalgonda district. Cotton based farming systems were next to cereal based in the district. Horticulture based activity was major for marginal farmers where as cereal based farming systems are dominating in case of small farmers.

TABLE 1.1—IDENTIFICATION OF FARMING SYSTEMS OF SAMPLEHOUSE HOLD IN NALGONDA

S. No	Farming systems	Marginal	Small	Medium	Large	All farms
	Cereal based farming system					
1.	Paddy+ Paddy+ Livestock	3	13		3	19
2.	Paddy+Paddy+Cattle+Goat		3			3
3.	Paddy+Redgram+Cattle			2		2
4.	Paddy+Redgram		2			2
5.	Paddy+Paddy			3	5	8
6.	Paddy+Paddy+Sheep			3		3
7.	Paddy+Cattle+Sheep				2	2
8.	Paddy+Sunflower+Livestock			3		3
	SUB-TOTAL	**8**	**4**	**1**	**1**	**14**
	Cotton based farming system					
9.	Cotton	4	1	0		5
10.	Cotton+Ground nut+Livestock		1			1
11.	Cotton+Maize		1			1
12.	Cotton+Livestock	4	1		0	5
13.	Cotton+Bengal gram		0	1	1	2
	SUB-TOTAL	**8**	**4**	**1**	**1**	**14**

TABLE 1.1—IDENTIFICATION OF FARMING SYSTEMS OF SAMPLE HOUSEHOLD IN NALGONDA—*Contd.*

S. No	Farming systems	Marginal	Small	Medium	Large	All farms
	Livestock based farming system					
14.	Livestock+Rice+Maize	2		0		2
	SUB-TOTAL	**2**		**0**		**2**
	Horticulture based farming system					
15.	Horticulture+Paddy++Livestock	6	2		1	9
16.	Chillie+ Groundnut	2				2
17.	Vegetables+livestock+pulses	3				3
	SUB TOTAL	**11**	**2**	**0**	**1**	**14**
	GRAND-TOTAL	**24**	**24**	**12**	**12**	**72**

TABLE 1.2 —FARM SIZE—WISE NUMBER OF FARMERS IN DIFFERENT FARMING SYSTEMS IN THE STUDY AREA

Farming system	Marginal	Small	Medium	Large	All farms
Cereal based	3	18	11	10	42
	(12.50)	(75.00)	(91.67)	(83.34)	(58.33)
Livestock based	2	0	0	0	2
	(8.33)	(0.00)	(0.00)	(0.00)	(2.78)
Cotton based	8	4	1	1	14
	(33.33)	(16.67)	(8.33)	(8.33)	(19.44)
Horticulture based	11	2	0	1	14
	(45.80)	(8.33)		(8.33)	(19.44)
	24	24	12	12	72

Details of farm size wise share in gross income of different farming systems in the study area were presented in the table 1.3 'Horticulture +Cereal+Livestock' System was found most important in terms of contribution to farm income in the area. Its share is more than 72 per cent. However cereals were dominating in all size group incomes except in the case of small farmers. Spices were contributing more than thirty per cent income in case of small farmers of STZ.

TABLE 1.3—FARM SIZE WISE SHARE IN GROSS INCOME OF DIFFERENT FARMING SYSTEMS

(per cent)

Particulars	Marginal farms	Small farms	Medium farms	Large farms	All farms
Cereal based farming systems	3.00	18.00	11.00	10.00	42.00
Size of holding	0.43	1.21	2.72	1.27	0.65
Cereal crops	58.04	59.40	78.60	60.04	67.57
Cotton crop	22.10	6.73	16.59	20.10	8.10
Fruit crops	0.00	0.00	0.00	0.00	0.00
Spices crops	8.32	12.21	8.16	8.32	10.07
Livestock production	10.39	17.58	9.73	10.39	13.43
Poultry production	1.15	1.68	0.22	1.15	0.93
Gross income	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**

TABLE 1.3—FARM SIZE WISE SHARE IN GROSS INCOME OF DIFFERENT FARMING SYSTEMS—*Contd.*

(Per cent)

Particulars	Marginal farms	Small farms	Medium farms	Large farms	All farms
Cotton based farming systems	8.00	4.00	1.00	1.00	14.00
Size of holding	0.53	1.11	2.02	5.07	2.11
Cereal crops	5.61	27.88	10.69	29.49	23.31
Cotton crop	92.30	57.80	76.08	38.30	61.90
Vegetable crops	0.00	1.33	6.00	24.40	4.50
Livestock production	2.09	11.50	9.55	7.67	9.54
Gross income	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
Livestock based farming systems	2.00		0.00		2.00
Size of holding	0.55	1.51	2.62	4.69	1.72
Cereal crops	24.02	25.07	25.47	35.85	41.75
Cotton crop	0.00	19.26	19.26	0.00	19.78
Vegetable crops	1.10	2.28	2.28	0.00	2.52
Fruit crops	0.00	0.00	0.00	0.00	0.00
Spices crops	1.03	0.00	0.00	0.00	3.62
Livestock production	54.43	41.19	40.79	58.32	41.48
Others (Specify)	19.42	12.22	12.20	5.83	18.05
Gross income	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
Horticulture based farming systems	11.00	2.00	0.00	1.00	14.00
Size of holding	0.54	1.33	2.55	4.76	1.65
Cereal crops	20.11	15.79	23.9	3.74	18.79
Cotton crop	0.00	33.47	11.83	13.62	1.16
Vegetable crops	6.35	1.93	8.33	1.63	4.63
Fruit crops	0.00	0.00	7.83	81.01	6.87
Spices crops	68.38	57.87	34.18		64.40
Livestock production	4.71	5.30	4.12		3.91
Others (Specify)	0.45	1.04	9.82		0.24
Gross income	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
All farm based farming systems					
Size of holding	0.45	1.44	2.52	14.51	1.73
Cereal crops	24.46	27.86	25.62	35.82	25.84
Cotton crop	17.20	7.84	25.16	28.06	15.65
Vegetable crops	2.43	3.70	2.27	0.00	2.83
Spices crops	20.93	38.07	23.06	0.00	27.15
Livestock production	22.05	17.44	17.20	15.40	19.51
Poultry production	0.12	0.04	0.30	0.29	0.13
Fisheries	0.52	0.00	0.00	0.00	0.23
Others (Specify)	12.30	5.05	6.38	20.43	8.65
Gross income	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**

Note: NA - Information was not available.

Identification of Farming Systems in Central Telangana Zone

Four types of farming systems followed in the area based on a major system were (i) Cereal based farming systems, (ii) Cotton based farming systems, (iii) Livestock based farming systems and (iv) Horticulture based farming systems. The data were collected based on the above four farming systems and are depicted in Table 1.4. In all 15 sub farming systems were identified. The maximum number of sub-farming systems were of cereal based farming systems (5) and cotton based farming system (5) followed by livestock based farming systems (3) and Horticulture based farming systems (2). Based on the adoption of sub-farming systems by more number of households, the most preferred farming systems were Paddy-fallow (10 Households) and Paddy+Black gram+ Livestock (4 Households).

Since the study area is known for its principal crops rice and cotton, the maximum sub-farming systems were either paddy or cotton based or involved paddy or cotton in the farming system. The number of farm households following paddy or cotton based system was also found to be more in the study area. Different activities of farming systems were presented size category wise and also their per cent wise in the descending order. Cereal based farming system and cotton based farming systems were predominant in Warangal district.

TABLE 1.4—IDENTIFICATION OF FARMING SYSTEMS OF SAMPLE HOUSE HOLD IN WARANGAL

S. No.	Cereal based farming systems	Household Categories				
		Marginal	Small	Medium	Large	All farms
1.	Rice+Fallow	10	—	—	—	10
2.	Rice+Livestock+Maize	—	1	—	—	1
3.	Rice+Green gram+Livestock	—	3	1	—	4
4.	Rice+Fallow+Livestock	—	1	—	—	1
5.	Maize+Groundnut+Livestock	—	1	—	—	1
	SUB TOTAL	**10**	**5**	**1**	**0**	**16**
	Cotton based farming systems					
6.	Cotton	9	3	1	—	13
7.	Cotton+Ground nut+Livestock	—	3	—	—	3
8.	Cotton—Maize	—	3	—	—	3
9.	Cotton+Livestock	8	6	—	1	15
10.	Cotton+Bengal gram	—	1	3	5	9
	SUB TOTAL	**17**	**16**	**4**	**6**	**43**
	Horticulture based farming systems					
11.	Chillie+Groundnut+Livestock	—	1	1	3	5
12.	Chillie+Groundnut	—	1	1	—	2
	SUB TOTAL	**0**	**2**	**2**	**3**	**7**
	Livestock based farming systems					
13.	Livestock+Cotton	—	2	—	—	2.
14.	Livestock+Rice+Maize	—	1	—	—	1
15.	Diary+Cotton+Bengal gram	—	1	2	—	3
	SUB TOTAL	**0**	**4**	**2**	**0**	**6**
	GRAND TOTAL	**27**	**27**	**9**	**9**	**72**

Livestock and horticulture based farming systems were next to cereal based and cotton based in Warangal district. Cotton based farming systems are dominating in case of marginal farmers in the district. Cotton based along with horticulture gardens and cash crops are the predominant activity in Warangal district.

Details of farm size-wise share in gross income of different farming systems in the study area were presented in the Table 1.6 'Cotton+Cereal+Livestock' system was found most important in terms of contribution to farm income in the area. This cropping system was prevalent across the size classes of holding in the district.

TABLE 1.5—FARM SIZE-WISE NUMBER OF FARMERS IN DIFFERENT FARMING SYSTEMS IN WARANGAL

Farming Systems	Marginal	Small	Medium	Large	All farms
			Warangal District		
Cereal based	10	5	1	0	16
	(37.04)	(18.52)	(11.11)	(0.00)	(22.22)
Livestock based		4	2	0	6
		(14.81)	(22.22)	(0.00)	(8.33)
Cotton based	17	16	4	6	43
	(62.96)	(59.26)	(44.44)	(66.67)	(59.72)
Horticulture based		2	2	3	7
		(7.41)	(22.22)	(33.33)	(9.72)
	27	27	9	9	72
	100.00	100.00	100.00	100.00	100.00

*Figures in parenthesis are percentage.

A perusal of the Table 1.6 revealed that the contribution of cotton based farming system in the gross income was decreasing with increasing size of holding in the district. Cotton crop was contributed about 67 and 51 per cent of the gross income of the small and marginal farmers, respectively. Small and marginal farmers following cereal based farming system earned gross income of about 65 and 81 per cent from cereals, respectively.

TABLE 1.6— FARM SIZE-WISE SHARE IN GROSS INCOME OF DIFFERENT FARMING SYSTEMS (PER CENT) IN WARANGAL

Particulars	Marginal farms	Small farms	Medium farms	Large farms	All farms
Cereal based farming systems					
	10	5	1	0	16
Size of holding	0.71	2.00	NA	NA	1.36
Cereal crops (Paddy)	65.48	81.40	NA	NA	63.45
Pulse crops (Black gram)	0.00	0.00	NA	NA	2.78
Cotton crop	27.97	18.60	NA	NA	6.35
Livestock production	6.55	0.00	NA	NA	27.42
Gross income	100.00	100.00	NA	NA	100.00
Cotton based farming systems					
	17	16	4	6	43
Size of holding	0.88	1.69	2.80	NA	2.31
Cereal crops	25.33	30.28	0	NA	18.03
Pulse crops	0	3.36	0	NA	2.00
Oilseeds crops	0	0.00	0	NA	0
Cotton crop	67.07	50.63	94.74	NA	67.66
Spices crops	0	7.01	0	NA	9.15
Livestock production	7.60	9.82	5.26	NA	3.16
Poultry production	0	0	0	NA	0
Gross income	100.00	100.00	100.00	NA	100.00

TABLE 1.6— FARM SIZE-WISE SHARE IN GROSS INCOME OF DIFFERENT FARMING SYSTEMS (PER CENT) IN WARANGAL—*Contd.*

Particulars	Marginal farms	Small farms	Medium farms	Large farms	All farms
Livestock based farming systems					
		4	2	0	6
Size of holding	0.70	1.37	3.00		1.69
Cereal crops	0.00	38.30	0.00	NA	12.09
Pulse crops	0.00	0.00	13.18	NA	13.08
Cotton crop	0.00	33.86	37.54	NA	34.39
Livestock production	100.00	27.84	50.28	NA	40.44
Gross income	100.00	100.00	100.00	NA	100.00
Horticulture based farming systems					
		2	2	3	7
Size of holding	NA	NA	3.20	NA	3.20
Cereal crops	NA	NA	20.41	NA	20.41
Spices crops	NA	NA	77.55	NA	77.55
Livestock production	NA	NA	2.04	NA	2.04
Gross income	NA	NA	100.00	NA	100.00
All farm based farming systems					
	27	27	9	9	72
Size of holding	0.80	1.69	3.00	NA	1.83
Cereal crops	37.43	42.97	40.45	NA	32.99
Pulse crops	0.00	0.00	2.59	NA	0.00
Cotton crop	54.36	52.78	45.18	NA	45.88
Vegetable crops	0.00	0.00	0	NA	0.00
Spices crops	0.00	0.00	—	NA	0.00
Livestock production	8.21	4.25	6.03	NA	10.63
Others (Specify)	0.00	—	5.75	NA	10.50
Gross income	100.00	100.00	100.00	NA	100.00

Note: NA - Information was not available.

Identification of Farming Systems in Northern Telangana Zone

Four types of farming systems followed in the area based on a major system were (i) Cereal based farming systems (ii) Spice based farming systems (iii) Pulse and oilseed based farming systems and (iv) Horticulture based farming systems. The data were collected based on the above four farming systems and are depicted in Table 1.7

TABLE 1.7—IDENTIFICATION OF FARMING SYSTEMS OF SAMPLE HOUSEHOLD IN WARANGAL

Farming Systems	Marginal	Small	Medium	Large	Total
Cereal based	88.24	54.84	48.39	70.83	62.14
Horticulture based	0.00	6.45	0.00	8.33	3.88
Sugarcane based	0.00	3.23	6.45	4.17	3.88
Pulse oil seed based	0.00	9.68	9.68	0.00	5.83
Spice based	11.76	25.81	35.48	16.67	24.27
Total	**100**	**100**	**100**	**100**	**100**
Sample Size	**17**	**31**	**31**	**24**	**103**

based on the adoption of sub farming systems by more number of households, the most preferred farming systems were Paddy+Paddy+Livestock and Paddy+Paddy.

Since the study area is known for its principal crops Rice and Chillies the maximum sub farming systems were either Paddy or Hort based or involved paddy or Horticultural crops in the farming system. The number of farm house holds following Paddy or Horticulture based system was also found to be more in the study area.

Different activities of farming systems were presented size category wise and also their percent in the descending order. Cereal based farming system was predominant in terms of area occupied in Karimnagar district. These results are in coincidence with the results obtained by the earlier studies conducted by Chowdry *et al* (1996) where in the progress towards specialization in agriculture was reported in Nizambad district during the study period i.e 1993-95. Similarly Joshi *et al* (2004) reported reduced indices of Simpson's crop diversity in cereal and sorghum growing areas of the Telangana region. Horticulture crops such as Chillies and vegetable based farming systems were next to Cereal based in the district. Cereal based followed by Spice based activity was major for marginal farmers where as Cereal and spices were in equal proportion in case of Medium farmers.

TABLE 1.8—FARM SIZE WISE SHARE IN GROSS INCOME OF DIFFERENT FARMING SYSTEMS (IN PER CENT)

Farming Systems	Source of income							
	PO	LS	CT	CL	Spices	VF	SC	Total
Cereal based	5.17	15.01	7.59	34.80	16.85	11.40	9.16	100.00
Horticulture based	0.00	2.90	0.00	44.77	37.21	15.12	0.00	100.00
Spice based	1.18	6.27	63.98	23.35	5.22	0.00	0.00	100.00
Pulses and oilseeds based	100	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Sugarcane based	3.23	2.87		13.89	17.91		62.10	100.00

NOTE : CL denotes Cereal, PO denotes Pulses and oilseeds, LS denotes Livestock, VF denotes Vegetables and Fruits, SC denotes Sugarcane and Others denote Coffee and Income from other occupation.

Details of farm size wise share in gross income of different farming systems in the study area were presented in the Table 1.8 Sugarcane and Spices are contributing more in terms of income in the farming system among the farming systems studied in the northern Telangana zone.

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Yield Gap Analysis of Rabi Foodgrain Crops in Solapur District of Maharashtra

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Abstract

Rabi crops play a major role to meet the foodgrains requirement of ever growing population. In India, out of total foodgrain production, rabi crop production is nearly half. Rabi jowar, wheat and gram are the major rabi crops. Though there is significant increase in area and production of rabi crops, the productivity showed decreasing trend in last two decades. In general, most of the farmers are not using the recommended levels of inputs. Therefore, there exists a gap between the recommended and actual use levels of input mix. This leads to a gap in the potential yield and the actual yield of the rabi crops (Jowar, wheat and gram), which is called yield gap. The present investigation was attempted to examine the input use and output levels, to estimate the yield alongwith factors responsible for the yield gap and the constraints in cultivation of jowar, wheat and gram. Jowar, wheat and gram are the major rabi crops of Maharashtra. Solapur is one of the important district rabi jowar, wheat and gram. Hence, the present study was purposively conducted in Solapur district of Maharashtra.

The Madha, Malshiras and Barshi tahsils were selected purposively. Three villages from each tahsil with probability proportion to area under rabi crops were selected randomly 15 cultivators, i.e. 5 each from small (below 2 ha), medium (2.1 to 4.0 ha) and large (above 4.0 ha) size classes were selected randomly from each of the village. The total sample size of 135 rabi crop cultivators comprised of 45 each from small, medium and large size categories of farms. The yield gaps were estimated by using the methodology developed by International Rice research Institute (IRRI), Manila, Philippines.

The inputs used for rabi jowar were far below than the recommendation. In the case of wheat except seeds other inputs were used below the recommendation. But in the case of gram all the inputs were used in excess. This lead to gap between the potential farm yield and actual farm yield. The highest yield gap was observed in the case of gram among all the selected rabi crops. There existed a great variability in the production elasticities of different inputs used in the production of rabi jowar, wheat and gram. Human labour, bullock labour, nitrogenous, phosphorous and potash fertilizers, number of irrigations and expenditure on seed and plant protection measures were the major factors responsible for the yield gap. Lack of credit availability, lack of irrigation facilities, labour management, low availability of improved varieties, high costs of fertilizers, irregular power supply, inadequacy of labour at required time and unavailability of biofertilizers were the major constraints faced by the rabi crop growers.

With the ever growing population food security has become a major issue. As rabi crops have a significant contribution in the food basket, their production needs to be increased by increasing the area under rabi crops or bringing the improvement in productivity. However, the expansion in the area is quite difficult due to restricted area, hence; the alternative way is to increase productivity of the rabi crops. In view, the farmers should be encouraged for judicious use of the inputs. The use of important variables has to be carefully extended by the rabi crop farmers to minimize the yield gap. Besides, the input supply system should ensure quality improved seed, regular supply of water, adequate and uninterrupted power supply and technical know-how to the growers for scientific cultivation of the rabi crops. In India, rabi crops play a major role to meet the foodgrains requirement of ever growing population. Out of total foodgrain production (230.8 million tonnes), rabi crop production is nearly half (109.8 million tonnes). Rabi jowar, wheat and gram are the major rabi crops (Source: Economic survey, 2009-10).

Jowar/Sorghum is a staple food in North Karnataka, Maharashtra, Andhra Pradesh, Gujarat", Madhya Pradesh and Rajasthan. India ranks, first in rabi jowar production in the world. It is native of India and being grown over 30 lakh hectares of land. Maharashtra accounted for the maximum area under jowar of 50.94 lakh hectares followed by Karnataka (17.81 lakh hectares) and Rajasthan (6.74 lakh hectares).In Maharashtra, jowar is cultivated in Solapur, Satara, Ahmednagar, Osmanabad and Latur districts. (*Source: Economic survey of Maharashtra, 2009-10*).

Wheat (*Triticum sp.*) is one of the most important cereal crop in world on which half of the world's population survive. In India, it is being grown over 28 million hectares and which harvests 78.6 MT with productivity of 2802 kg/ha. In Maharashtra, Solapur is one of the important districts which covers 50891 hectare of area under wheat cultivation. (*Source: Economic survey o Maharashtra, 2009-10*).

Gram is a major pulse crop grown in rabi season in Maharashtra. The major gram producing countries are India

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(68.13 per cent) followed by Turkey (7.56 per cent), Pakistan (4.64 per cent), Iran (3.20 per cent) and Mexico (3.07 per cent). The world production was around 7.8 million tonnes during 2002. (*Source: www fao.org*). The major producing states are Madhya Pradesh, Uttar Pradesh, Rajasthan, Maharashtra, Andhra Pradesh and Karnataka. During 2001-2002, in Maharashtra, it covered 1143 thousand hectares of land with production of 774 thousand tonnes and productivity of 677 Kg/ha. In Maharashtra, Solapur is one of the major districts that covers 31643 hactors under this crop. (Source: Economic Survey, 2008-09).

Though there is significant increase in area and production of rabi crops, the productivity showed decreasing trend in last two decades. In general, most of the farmers are not using the recommended levels of inputs. Therefore, there exists a gap between the recommended and actual use levels of input mix. This leads to a gap in the potential yield and the actual yield of the rabi crops (jowar, wheat and gram), which is called yield gap. The present investigation was attempted to examine the input use and output levels, to estimate the yield alongwith factors responsible for the yield gap and the constraints in cultivation of jowar, wheat and gram.

Methodology

Jowar, wheat and gram are the major rabi crops of Maharashtra. Solapur is one of the important district which covers 712897 ha, 53665 ha and 31580 ha of area under rabi jowar, wheat and gram, respectively (*Source: Social and Economic survey of Solapur district*, 2009). Hence, the present study was purposively conducted in Solapur , district of Maharashtra.

The more acreage under rabi jowar, wheat and gram cultivation is found in Madha, Malshiras and Barshi tahsils of Solapur district.Therefore, Madha, Malshiras and Barshi tahsils were selected purposively for the present study. Three villages from each tahsil with probability proportion to area under rabi crops were selected randomly. On the basis of operational land holdings, 15 cultivators, i.e. 5 each from small (below 2 ha), medium (2.1 to 4.0 ha) and large (above 4.0 ha) size classes were selected randomly from each of the village. The total sample size of 135 rabi crop cultivators comprised of 45 each from small, medium and large size categories of farms.

The yield gaps were estimated by using the methodology developed by International Rice research Institute (IRRI), Manila, Philippines as follows :

Total Yield Gap =	Potential yield Yp (Yield realized at research station)	—	Actual yield Ya (Yield realized on farmers field)
Yield gap I =	Potential yield Yp	—	Potential farm yield Yd (Yield realized on demonstration plots)
Yield gap II =	Potential farm yield Y P	—	Actual yield Ya
Yield gap III =	Maximum yield on farmers field Ym	—	Actual yield Ya

The following from of function was used for estimating the numerical values of parameters of various independent variables influencing the yield gap

$$Yg = aX_1^{b1} X_2^{b2} .....X_8^{b8} e^u$$

Where,

Yg = Per farm yield gap (Qu) (Potential farm yield - Actual yield)

a = Constant

X_1 = Area under crop (ha.)

X_2 = Human labour (man days) per farm

X_3 = Bullock labour (pair days) per farm

X_4 = N (kg) per farm

X_5 = P (kg) per farm

X_6 = K (kg) per farm

X_7 = Expenditure on seed and plant protection (Rs.) per farm

X_8 = No. of irrigations per farm

e^u = Error term

Results

I. Resource use and productivity

a. Rabi Jowar

The size class wise information regarding per hectare resource structure use and productivity of rabi jowar on sample farms is given in Table 1.

TABLE 1—RESOURCE USE AND PRODUCTIVITY OF RABI JOWAR

(Per ha.)

Sr. No.	Particulars	Size group			
		Small N*=15 A* = 9.32	Medium N* = 15 A* = 21.59	Large N* = 15 A* = 23.40	Overall N* = 45 A* = 26.23
1.	Total Human labour (man days)	65.45	53.47	42.57	53.82
	a Male	23.21	23.39	20.07	22.22
	b Female	42.24	30.08	22.50	31.60
2.	Bullock (pair days)	6.88	3.26	2.20	4.11
3.	Machine (hrs.)	7.25	9.68	7.36	8.09
4.	Seed (kg .)	10.35	10.19	10.90	10.48
5.	Manure (qtl.)	21.34	6.66	2.14	10.05
6.	Fertilizer (kg.)	62.06	32.53	14.88	36.49
	a Nitrogen	43.38	21.20	12.98	25.85
	b Phosphorous	11.79	9.56	1.21	7.52
	c Potassium	6.89	1.77	0.69	3.12
7.	Productivity (qtls.)	10.76	9.26	11.70	10.57

(N*- Number of sample farms, A *- Area under rabi jowar in ha.)

The small farms were found to use larger amount of almost all the inputs for rabi jowar followed by medium and large farms. But, the yield of large farms was the highest with relatively less amount of inputs. This may be because of overutilization of some of the inputs by the medium and small farms.

b. Wheat

TABLE 2—RESOURCE USE AND PRODUCTIVITY OF WHEAT

(Per ha.)

Sr. No.	Particulars	Size group			
		Small N*=15 A* = 6.28	Medium N* = 15 A* = 10.47	Large N* = 15 A* = 12.040	Overall N* = 45 A* = 9.59
1.	Total Human labour (man days)	58.99	55.98	69.27	61.41
	a Male	22.67	28.43	27.00	26.03
	b Female	36.32	27.55	42.27	35.38
2.	Bullock (pair days)	4.00	5.78	3.27	4.35
3.	Machine (hrs.)	18.15	7.07	13.37	12.86
4.	Seed (kg.)	102.70	107.45	106.56	105.57
5.	Manure (qtl.)	13.54	9.07	11.46	11.36
6.	Fertilizers (kg.)	184.08	111.45	151.33	148.95
	a Nitrogen	99.84	63.17	80.81	81.27
	b Phosphorous	69.27	41.01	59.79	56.69
	c Potassium	14.97	7.27	10.73	10.99
7.	Productivity (qtls.)	25.61	23.99	24.68	24.76

(N*- Number of sample farms, A *- Area under wheat in ha.)

It can be observed from above that the medium farms had low productivity compared to other farm size, this may be because of less use of manures and fertilizers as compared to large and small farmers. Small farms had the highest yield, because the inputs have been efficiently used due to its small size.

c. Gram

TABLE 3—RESOURCE USE AND PRODUCTIVITY OF GRAM

(Per ha.)

Sr. No.	Particulars	Size group			
		Small N*=15 A* = 5.61	Medium N* = 15 A* = 7.14	Large N* = 15 A* = 7.7740	Overall N* = 45 A* = 6.84
1.	Total Human labour (man days)	53.71	54.00	43.81	50.50
	a Male	16.46	17.10	9.97	14.51
	b Female	37.25	36.90	33.84	35.99
2.	Bullock (pair days)	3.12	1.99	2.78	2.63
3.	Machine (hrs.)	8.91	15.68	10.55	11.71
4.	Seed (kg.)	68.28	77.45	84.55	76.76
5.	Manure (qtl.)	25.49	58.82	32.56	38.96
6.	Fertilizer (kg.)	90.20	127.86	150.18	122.75
	a Nitrogen	47.68	69.53	86.55	67.95
	b Phosphorous	41.21	50.49	58.40	50.03
	c Potassium	1.31	7.84	5.23	4.79
7.	Productivity (qtls.)	13.48	16.61	13.42	14.50

(N*- Number of sample farms, A *- Area under gram)

Any crop will yield high at the optimum dose of all its inputs. Similar is the case herewith the gram. The small and large farms have either over utilized or underutilized the resource leading to less yield than the medium farms. It may be because medium farms might have used the resources optimally.

II. Gaps in Recommended and Actual use Levels

On the basis of size of holding, per hectare gaps in the recommended and actual use levels of inputs and output for rabi jowar is presented in Table 4. The per hectare use of inputs at the overall level for rabi jowar were far below than the recommendation.

TABLE 4—INPUTS AND YIELD GAP OF RABI JOWAR

(Per ha.)

Sr. No.	Particulars	Size groups				
		Resource use	Small N*=15	Medium N* = 15	Large N* = 15	Overall N* = 45
1.	Seed (kg.)	Recommended	50.00	50.00	50.00	50.00
		Actual use	10.35	10.19	10.90	10.48
		Gap	39.65	39.81	39.10	39.52
		Per cent gap	79.30	79.62	78.20	79.04
2.	Nitrogen (kg.)	Recommended	80.00	80.00	80.00	80.00
		Actual use	43.38	21.20	12.98	25.85
		Gap	36.62	58.80	67.02	54.15
		Per cent gap	45.77	73.50	83.77	67.68

TABLE 4—INPUTS AND YIELD GAP OF RABI JOWAR—*Contd.*

(Per ha.)

Sr. No.	Particulars	Resource use	Size groups Small N*=15	Medium N* = 15	Large N* = 15	Overall N* = 45
3.	Phosphorous (kg.)	Recommended	40.00	40.00	40.00	40.00
		Actual use	11.79	9.56	1.21	7.52
		Gap	25.21	30.44	38.79	32.48
		Per cent gap	70.52	76.10	96.97	81.20
4.	Potash (kg.)	Recommended	40.00	40.00	40.00	40.00
		Actual use	6.89	1.77	0.69	3.12
		Gap	33.11	38.23	39.31	36.88
		Per cent gap	82.77	95.57	98.27	92.20
5.	Total yield gap (yield gap-I) (kg.)	Recommended	25.00	25.00	25.00	25.00
		Actual use	10.76	9.26	11.7	10.57
		Gap	14.24	15.74	13.3	14.43
		Per cent gap	56.96	62.96	53.2	57.72
6.	Yield gap-II (kg.)	Recommended	25.00	25.00	25.00	25.00
		Actual use	22.52	22.52	22.52	22.52
		Gap	2.48	2.48	2.48	2.48
		Per cent gap	9.92	9.92	9.92	9.92
7.	Yield gap-III (kg.)	Recommended	22.52	22.52	22.52	22.52
		Actual use	10.76	9.26	11.70	10.57
		Gap	11.76	13.26	10.82	11.95
		Per cent gap	52.22	58.88	48.05	53.06
8.	Yield gap-IV	Recommended	23.00	23.00	23.00	23.00
		Actual use	10.76	9.26	11.70	10.57
		Gap	12.24	13.74	11.30	12.43
		Per cent gap	53.22	59.74	49.13	54.04

TABLE 5—INPUTS AND YIELD GAP OF WHEAT

(Per ha.)

Sr. No.	Particulars	Resource use	Size groups Small N*=15	Medium N* = 15	Large N* = 15	Overall N* = 45
1.	Seeds (kg.)	Recommended	100.00	100.00	100.00	100.00
		Actual use	102.70	107.45	106.56	105.57
		Gap	–2.70	–7.45	–6.56	–5.57
		Per cent gap	–2.70	–7.45	–6.56	–5.57
2.	Nitrogen (kg.)	Recommended	120.00	120.00	120.00	120.00
		Actual use	99.84	63.17	80.81	81.27
		Gap	20.16	56.83	39.19	38.73
		Per cent gap	16.80	47.36	32.66	32.28
3.	Phosphorous (kg.)	Recommended	60.00	60.00	–60.00	60.00
		Actual use	69.27	41.01	59.79	56.69
		Gap	–9.27	18.99	0.21	3.31
		Per cent gap	–15.45	31.65	0.35	5.52

TABLE 5—INPUTS AND YIELD GAP OF WHEAT—*Contd.*

(Per ha.)

Sr. No.	Particulars	Resource use	Size groups: Small N*=15	Medium N* = 15	Large N* = 15	Overall N* = 45
4.	Potash (kg.)	Recommended	40.00	40.00	40.00	40.00
		Actual use	14.97	7.27	10.73	10.99
		Gap	25.03	32.73	29.27	29.01
		Per cent gap	62.58	81.83	73.18	72.53
5.	Total yield gap (yield gap-I) (kg.)	Recommended	45.00	45.00	45.00	45.00
		Actual use	25.61	23.99	24.68	24.76
		Gap	19.39	21.01	20.32	20.24
		Per cent gap	43.09	46.69	45.16	44.98
6.	Yield gap-II (kg.)	Recommended	45.00	45.00	45.00	45.00
		Actual use	40.75	40.75	40.75	40.75
		Gap	4.25	4.25	4.25	4.25
		Per cent gap	9.44	9.44	9.44	9.44
7.	Yield gap-III (kg.)	Recommended	40.75	40.75	40.75	40.75
		Actual use	25.61	23.99	24.68	24.76
		Gap	15.14	16.76	16.07	15.99
		Per cent gap	37.15	41.13	39.44	39.24
8.	Yield gap-IV	Recommended	48.00	48.00	48.00	48.00
		Actual use	25.61	23.99	24.68	24.76
		Gap	22.39	24.01	23.32	23.24
		Per cent gap	46.65	50.02	48.58	48.42

There is a large gap between the recommendation and actual use level of rabi jowar seed, which must be the major reason for high yield gap. In the case of nutrients, potash is observed to have high use gap compared to others. It is observed that the use gap was less in nitrogen followed by phosphorous, as farmers have developed tendency to use easily available and cheap straight fertilizers such as urea, inhibiting the use of 'K' fertilizers. The per hectare gaps in the recommendation and actual use levels of inputs and output on wheat farms are depicted in Table 5.

At the overall level, the per hectare use of all the nutrients for wheat were below the level of recommendation. At the overall, level the gap for nitrogen, phosphorous and potash was found to be 32.28 per cent, 5.52 per cent and 72.53 per cent, respectively.

In the case of wheat, it can be observed that the seed was overused and fertilizers were underutilized and unbalanced. This might have lead to decreased productivity. The size class wise per hectare gaps in the recommended and actual use levels of inputs and output of gram are presented in Table 6.

TABLE 6—INPUTS AND YIELD GAP OF GRAM

(Per ha.)

Sr. No.	Particulars	Resource use	Size groups: Small N*=15	Medium N* = 15	Large N* = 15	Overall N* = 45
1.	Seeds (kg.)	Recommended	50.00	50.00	50.00	50.00
		Actual use	68.8	77.45	84.55	76.76
		Gap	–18.28	–27.45	–34.55	–26.76
		Per cent gap	–36.56	–54.90	–69.10	–53.52

TABLE 6—INPUTS AND YIELD GAP OF GRAM—*Contd.*

(Per ha.)

Sr. No.	Particulars	Resource use	Size groups: Small N=15	Medium N = 15	Large N = 15	Overall N = 45
2.	Nitrogen (kg.)	Recommended	12.50	12.50	12.50	12.50
		Actual use	47.68	69.53	86.55	76.76
		Gap	–35.18	–57.03	–74.05	–55.42
		Per cent gap	–281.4	–456.2	–592.4	–443.3
3.	Phosphorous (kg.)	Recommended	25.00	25.00	25.00	25.00
		Actual use	41.21	50.49	58.40	50.03
		Gap	–16.21	–25.49	–33.40	–25.03
		Per cent gap	–64.84	–101.9	–133.6	–100.1
4.	Potash (kg.)	Recommended	0.00	0.00	0.00	0.00
		Actual use	1.31	7.84	5.23	4.79
		Gap	– 1.31	–7.84	–5.23	– 4.79
		Per cent gap	—	—	—	—
5.	Total yield gap (yield gap–I) (kg.)	Recommended	35.00	35.00	35.00	35.00
		Actual use	13.48	16.61	13.42	14.50
		Gap	21.52	18.39	21.58	20.50
		Per cent gap	61.49	52.54	61.66	58.57
6.	Yield gap–II (kg.)	Recommended	35.00	35.00	35.00	35.00
		Actual use	22.00	22.00	22.00	22.00
		Gap	13.00	13.00	13.00	13.00
		Per cent gap	37.14	37.14	37.14	37.14
7.	Yield gap–III (kg.)	Recommended	22.00	22.00	22.00	22.00
		Actual use	13.48	16.61	13.42	14.50
		Gap	8.52	5.39	8.58	7.50
		Per cent gap	38.73	24.50	39.00	34.09
8.	Yield gap–IV	Recommended	25.00	25.00	25.00	25.00
		Actual use	13.48	16.61	13.42	14.50
		Gap	11.52	8.39	11.58	10.50
		Per cent gap	46.08	49.94	68.93	62.50

In the case of gram all the inputs viz., seed, nitrogen, phosphorous and potash were found to excessively used against the recommended level. Amongst which nitrogen was extensively used to the tune of -443.3 per cent at the overall level, followed by phosphorous (-100.1 per cent).

The overuse of the inputs will lead to less profitability by reducing yield. This condition is found with gram. We can observe very high overuse of almost all the inputs considered in this topic. The overuse of fertilizers might have negatively affected the gram leading to low yield. The excess use of seeds simply adds to the cost and reduces yield due to high plant density.

Factors Affecting Yield Gap of Rabi Crops

The estimated parameters of production functions of the selected three rabi crops are represented in the Table 7.

TABLE 7—RESULTS OF ESTIMATED REGRESSION ANALYSIS OF RABI CROPS

Sr. No.	Particulars	Crop: Rabi Jowar (N = 45)	Wheat (N = 45)	Gram (N = 45)
1.	Const.	0.198	0.785	0.113
2.	Area under crop (ha) (X_1)	–0.183* **	O.078^{NS}	–0.125^{NS}
		(0.103)	(0.165)	(0.086)

TABLE 7—RESULTS OF ESTIMATED REGRESSION ANALYSIS OF RABI CROPS—*Contd.*

Sr. No.	Particulars	Crop: Rabi Jowar (N = 45)	Wheat (N = 45)	Gram (N = 45)
3.	Human labour (man days) (X_2)	0.336** (0.125)	–0.468*** (0.265)	–0.301 ** (0.124)
4.	Bullock labour (Pair days) (X_3)	0.610* (0.250)	0.064*** (0.035)	0.347*** (0.183)
5.	N (kg) (X_4)	–0.455*** (0.265)	–0.109** (0.046)	0.375** (0.146)
6.	P (kg) (X_5)	–0.025^{NS} (0.125)	0.008 (0.002)	0.191^{NS} (0.179)
7.	K (kg) (X_6)	0.056^{NS} (0.125)	–0.048"** (0.026)	0.165* (0.045)
8.	Expenditure on seed and plant protection (X_7)	–0.256 ** (0.115)	0.154** (0.065)	0.039^{NS} (0.381)
9.	No. of irrigation (X_8)	–0.189^{NS} (0.275)	–0.746** (0.356)	–0. 114 ^{NS} (0.098)
10	R^2	0.87	0.78	0.85

The study reveals that the huge gap in the yield gap can be reduced by increasing the use of seed and plant protection measures and fertilizers especially nitrogen in the case of rabi jowar. There is enough opportunity to increase the levels of nitrogen, potash and the number of irrigations through proper management to reduce the yield gap in wheat. The yield might have been low due to inefficient water management and low supply of crucial nutrients. The variables contributing to the yield gap of gram were fertilizers, plant protection measures, seed and seed.

Constraints in the adoption of crop production technologies

Lack of credit availability, lack of irrigation facilities, labour management, low availability of improved varieties, high cost of fertilizers, irregular power supply, inadequacy of labour at required time, unavailability of biofertilizers have been reported as the major problems or constraints in the adoption of production technologies of all the rabi crops. The constraints made the farmers seldom use such technologies and hence ultimately leading to the yield gap of the rabi crops.

Conclusions

1. The inputs used for rabi jowar were far below than the recommendation. In the case of wheat except seeds other inputs were used below the recommendation. But in the case of gram all the inputs were used in excess. This lead to gap between the potential farm yield and actual farm yield. The highest yield gap was observed in the case of gram among all the selected rabi crops.
2. There existed a great variability in the production elasticities of different inputs used in the production of rabi jowar, wheat and gram. Human labour, bullock labour, nitrogenous, phosphorous and potash fertilizers, number of irrigations and expenditure on seed and plant protection measures were the major factors responsible for the yield gap.
3. Lack of credit availability, lack of irrigation facilities, labour management, low availability of improved varieties, high costs of fertilizers, irregular power supply, inadequacy of labour at required time and unavailability of biofertilizers were the major constraints faced by the rabi crop growers.

Policy implications

With the ever growing population food security has become a major issue. As rabi crops have a significant contribution in the food basket, their production needs to be increased by increasing the area under rabi crops or bringing the improvement in productivity. However, the expansion in the area is quite difficult due to restricted area, hence, the alternative way is to increase productivity of the rabi crops. In view, the farmers should be encouraged for

judicious use of the inputs. The use of important variables has to be carefully extended by the rabi crop farmers to minimize the yield gap. Besides, the input supply system should ensure quality improved seed, regular supply of water, adequate and uninterrupted power supply and technical know-how to the growers for scientific cultivation of the rabi crops.

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Global Competitiveness in Dairy Sector

Dr. Ramphul*

Abstract: *The study has measured the extent of competition in the global dairy sector. Based on global competition, time series analysis has been carried out to find the past trend and future direction. The position of India has been examined and compared along with of a few other leading milk producers. The analysis indicates that over the past two decades the global competition for milk production has witnessed a downward trend. Whereas, the market share of milk production of India is increasing. This indicates that over the years the competitiveness of the Indian dairy sector has been improving. In this context, cost of milk production, farm size, infrastructure for milk collection, milk processing capacity, quality of dairy products, etc. have been highlighted to gain global competitive advantage. In addition, there is a need to manage the Indian dairy industry in a manner to enhance the production of dairy products and upgrade milk processing using innovative technologies.*

Introduction

The world dairy market has undergone significant structural changes over the last two decades as the milk production has expanded by an annual average compound growth rate of almost 2 per cent. More than half of the world's total milk production has been originated in the developing countries. Rapid economic growth in many developing countries and cured oil-exporting countries has stimulated demand for and production of dairy products. In addition, population growth, increased urbanisation and adoption of Western eating habits have also boosted demand. Furthermore, dairying is important for food security in many developing countries including India because it is a chief source of incomes and food for the majority of the rural poor (FAO, 2011).

In India, dairying has been considered as one of the activities aimed at alleviating the poverty and unemployment especially in the rural areas in the rain-fed and drought-prone regions. Moreover, this sector is crucial for reducing income inequalities. Dairy is the best insurance against the vagaries of nature like drought, famine and other natural calamities (Ramphul, 2011). Thus, the dairy sector rearing has vast scope for improving economic and in turn, the nutritional status of such people mainly coming from rural area. The progress in this sector results in a more balanced development of the rural economy (FAO, 2009).

The importance of milk in the human diet especially for children and expectant and nursing matter is vital. Given milk's nutritional quality, there is growing evidence of the role of dairy foods in reducing risk of numerous medical disorders. The nutritional value of milk is high and of particular value when it is included in the diets of growing infants and lactating mothers. Besides, to measure the socioeconomic development and standard of living in many developing countries, the level of per capita availability of milk has been treated as one of the important indices.

The FAO database indicates that the most significant milk producers are: India, USA, and China. Milk production is an integral component of Indian agriculture supporting the livelihood of more than two-thirds of the rural population. In the recent years, demand for dairy products has increased considerably across all household groups: rural, urban, rich and poor.

The increasing importance of dairy to the Indian economy means that the international competitiveness of the economy is very important. More importantly, globalization and trade liberalization coupled with the easy flow of information and advancement in transportation and communication technology have resulted in an unprecedented intensification of market competition worldwide. The analysis of global scenarios of the dairy sector may help us to know the position of the Indian dairy sector with respect to its global competitors. If the degree of global competition increases, then it may become a threat to an uncompetitive economy. On the other hand, if it decreases and even if the market share of the country under consideration is static, it may be an opportunity.

It may be added here that without competition it is impossible for the market to be guided by an invisible hand and the economy will ultimately falter, with both consumers and manufacturers suffering. For example, the failure of the planned economies of the USSR and Eastern Europe to produce the goods and services their people wanted emphasises the strengths of a market economy, and of decentralised markets. Therefore, competition ensures consumers have a variety of goods and services to choose from. New products will regularly be introduced, further adding to choice, and a better standard of living. Competition can also help foster lower prices. Against this backdrop, the study measures the degree of global competition among the leading milk producing countries. The specific objectives of our study are:

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a) To measure the extent of competition in the global dairy sector.
b) To assess the performance of the Indian dairy sector in the context of globalization.

Methodology

The present study is based on secondary sources of data. The data on milk production are taken from the official website of Food and Agriculture Organisation (i.e., http://faostat.fao.org). The information on cost of milk production is culled out from *International Farm Comparison Network Report* (2007). The data are annual. In the present study, we have considered ten leading milk producers. These are: India, USA, China, Pakistan, Russian Federation, Brazil, Germany, France, New Zealand, and United Kingdom. These top ten producers are accounted for about 60 per cent of the world's total milk production in 2010-11. Similarly, the cost of milk production is examined for seven lowest and seven highest cost countries. The lowest-cost producers consist of: Argentina, Belarus, Chile, Pakistan, Ukraine, India, and Bangladesh. The highest cost nations included in the study are: Switzerland, Finland, Austria, Norway, Turkey, Canada, and Germany.

The study covers a period of 19 years from 1992 to 2010. The sample period is selected by satisfying data availability constraint. As Russian Federation is the world's fifth largest milk producer and before 1992 data on its milk production are not available in the required form.

The world milk market has been examined in terms of the degree of competition, production shares, annual average compound growth rate of milk production, the cost of milk production, and trend in the degree of competition in milk production. A brief introduction of the methods of analysis used in the study is in order.

Annual Average Compound Growth Rate

The movements in milk production are analyzed in terms of annual compound growth rate. The compound annual growth rate (CAGR) has been computed by fitting the exponential function:

$$Y = ab^t$$

Logarithmic form of the exponential equation:

$$\text{Log } Y = \log a + \log b\, t$$

where

Y: Dependent variable,
b : 1+g; g = compound growth rate,
a : Intercept,
t : Time.

The parameters a and b in the model are estimated using Ordinary Least Square (OLS) method.

The compound growth rate is estimated applying following formula:

$$CAGR = [\text{Antilog } (\log b)-1]100 \quad ...(1)$$

Degree of Competition

Given the fact that the world dairy market is very thin, as about 87 per cent of the global milk production does not enter into international trade (Ramphul, 2012), the degree of competition has been measured on the basis of the market shares of the nations competing in global milk production. In order to find the degree of competition, we collect the market shares of nations competing in global milk production. The degree of global competition is defined as:

$$C = \left(1 - \sqrt{\sum m_i^2}\right) \quad ...(2)$$

where C = degree of competition, m_i is the market share of the each individual i^{th} nation in the global milk production, i ranges from 1 to k. For each year we may calculate one such measure, generating thereby a time series data. One can next carryout trend analysis. An increase in the value of C indicates the increase in global competition and vice-versa.

Results and Discussion

Tables 1 and 2 below present the time profile of milk production of leading producers and world at large in terms of volume, annual compound growth rate and share in the world's total milk production. It may be seen from Table 1 that India is the world's largest milk producer. Its gross output of milk has increased consistently from 56.41 million tonnes in 1992-93 to 117 million tonnes in 2010-11, growing at annual average compound growth rate of 4 per cent.

TABLE 1—TIME PROFILE OF GLOBAL MILK PRODUCTION OF TOP TEN PRODUCING COUNTRIES (IN MILLION TONNES)

Time	India	USA	China	Pakistan	Russian Federation	Brazil	Germany	France	New Zealand	United Kingdom	Rest of world	World
1992	56.41	68.42	8.07	16.28	47.23	16.42	28.02	26.39	8.05	14.78	235.84	525.91
1993	58.86	68.33	8.15	17.12	46.52	16.22	28.12	25.97	9.00	14.83	234.89	528.01

Table 1—Time Profile Of Global Milk Production Of Top Ten Producing Countries (In Million Tonnes)-*Contd*

Time	India	USA	China	Pakistan	Russian Federation	Brazil	Germany	France	New Zealand	United Kingdom	Rest of world	World
1994	61.40	69.67	8.68	18.01	42.17	16.42	27.89	25.95	9.81	14.99	237.59	532.58
1995	65.37	70.44	9.48	19.01	39.31	17.13	28.63	26.09	9.29	14.84	240.59	540.16
1996	68.36	69.86	10.19	22.97	35.82	19.20	28.80	25.82	10.01	14.81	241.19	547.02
1997	70.88	70.80	10.09	23.58	34.13	19.36	28.72	25.65	11.06	14.84	241.65	550.77
1998	74.10	71.41	10.52	24.22	33.25	19.39	28.40	25.57	11.38	14.63	246.62	559.49
1999	78.24	73.80	11.24	24.88	32.30	19.78	28.36	25.63	10.88	15.01	250.31	570.44
2000	79.66	76.02	12.37	25.57	32.28	20.53	28.35	25.74	12.24	14.49	251.64	578.88
2001	83.42	74.99	14.52	26.28	32.90	21.28	28.21	25.67	13.12	14.71	254.61	589.72
2002	84.76	77.14	17.34	27.03	33.50	22.46	27.90	25.99	13.87	14.87	259.74	604.59
2003	86.66	77.29	21.88	27.81	33.37	23.08	28.56	25.42	14.35	15.01	262.22	615.66
2004	91.06	77.54	27.81	28.62	32.17	24.34	28.28	25.27	15.03	14.56	264.61	629.29
2005	95.62	80.25	32.02	29.44	31.15	25.53	28.49	25.71	14.64	14.47	270.78	648.11
2006	99.35	82.46	36.47	31.21	31.44	26.33	28.03	25.03	15.17	14.32	276.29	666.11
2007	104.78	84.19	39.82	32.22	32.18	26.27	28.44	25.21	15.62	14.02	279.24	681.99
2008	108.54	86.18	40.20	33.26	32.36	28.58	28.69	24.38	15.22	13.72	284.43	695.54
2009	110.94	85.88	40.39	34.36	32.57	30.15	29.23	23.54	15.67	13.24	286.22	702.18
2010	117.00	87.46	41.15	35.49	32.14	31.82	29.67	24.21	17.01	13.96	290.97	720.87
CAGR (%)	4*	1.5*	11.6*	4.2*	-16.9*	3.8*	0.1*	-0.40*	3.9*	-0.5*	1.3*	1.9*

Note: * indicates that the growth rate is statistically significant at 1 per cent level.

Source: Authors' own calculation based on data available in FAO database.

In absolute terms, its growth in milk production over the medium terms is expected to sizeably exceed that of any other major milk producer. India's milk production has been increasing faster than the world's total milk. It has resulted in steady improvements in India's share in the global total milk production, jumped up from 10.7 per cent in 1992 to 14.1 per cent in 2001-02 and further to 16.2 per cent in 2010-11 as shown in Table 2. It may be attributable to successful completion of the Operation Flood Program (OFP) in India during last three decades. It has transformed India from a country of acute milk shortage to the world's top producer.

TABLE 2—TIME PROFILE OF MARKET SHARE OF TOP TEN PRODUCERS OF GLOBAL MILK PRODUCTION (%)

Time	India	USA	China	Pakistan	Russian Federation	Brazil	Germany	France	New Zealand	United Kingdom	Total of top ten	Rest of world
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1992	10.7	13.0	1.5	3.1	9.0	3.1	5.3	5.0	1.5	2.8	55.2	44.8
1993	11.1	12.9	1.5	3.2	8.8	3.1	5.3	4.9	1.7	2.8	55.5	44.5
1994	11.5	13.1	1.6	3.4	7.9	3.1	5.2	4.9	1.8	2.8	55.4	44.6
1995	12.1	13.0	1.8	3.5	7.3	3.2	5.3	4.8	1.7	2.7	55.5	44.5
1996	12.5	12.8	1.9	4.2	6.5	3.5	5.3	4.7	1.8	2.7	55.9	44.1
1997	12.9	12.9	1.8	4.3	6.2	3.5	5.2	4.7	2.0	2.7	56.1	43.9
1998	13.2	12.8	1.9	4.3	5.9	3.5	5.1	4.6	2.0	2.6	55.9	44.1
1999	13.7	12.9	2.0	4.4	5.7	3.5	5.0	4.5	1.9	2.6	56.1	43.9
2000	13.8	13.1	2.1	4.4	5.6	3.5	4.9	4.4	2.1	2.5	56.5	43.5
2001	14.1	12.7	2.5	4.5	5.6	3.6	4.8	4.4	2.2	2.5	56.8	43.2
2002	14.0	12.8	2.9	4.5	5.5	3.7	4.6	4.3	2.3	2.5	57.0	43.0
2003	14.1	12.6	3.6	4.5	5.4	3.7	4.6	4.1	2.3	2.4	57.4	42.6
2004	14.5	12.3	4.4	4.5	5.1	3.9	4.5	4.0	2.4	2.3	58.0	42.0
2005	14.8	12.4	4.9	4.5	4.8	3.9	4.4	4.0	2.3	2.2	58.2	41.8
2006	14.9	12.4	5.5	4.7	4.7	4.0	4.2	3.8	2.3	2.1	58.5	41.5
2007	15.4	12.3	5.8	4.7	4.7	3.9	4.2	3.7	2.3	2.1	59.1	40.9
2008	15.6	12.4	5.8	4.8	4.7	4.1	4.1	3.5	2.2	2.0	59.1	40.9
2009	15.8	12.2	5.8	4.9	4.6	4.3	4.2	3.4	2.2	1.9	59.2	40.8
2010	16.2	12.1	5.7	4.9	4.5	4.4	4.1	3.4	2.4	1.9	59.6	40.4

Note: Countries in first row are listed in descending order of their rank in the world's total milk production in 2010.

Source: Derived using data available in Table 1.

The USA is the 2nd largest producer of milk in the world accounting for 12.1 per cent of the world's total production in 2010-11, with a production of 87.46 million tonnes in 2010-11. China is the third largest milk producer, producing over 41 million tonnes in 2010-11. The expansion of China's milk production over last two decades has been extremely rapid. But because of low base China is accounted for only 5.7 per cent of global milk production. Here it may be noted that expansion in milk production in China has not matched the pace of growth in domestic consumption. It has meant that only some of the growth in Chain's dairy consumption has stimulated increased imports of dairy products. Pakistan is also an important producer of milk, accounts for 4.9 per cent of global milk production in 2010-11. The growth of milk production in Pakistan has been impressive, reported at more than 4 per cent per annum.

The Russian Federation is the 5th largest producer in the world producing over 32 million tonnes and accounting for 4.5 per cent of the world's total milk production during the same period. Other major milk producers are: Brazil (4.4 per cent), Germany (4.1 per cent), France (3.4 per cent), New Zeeland (2.4 per cent) and UK (1.9 per cent). These top ten producing countries accounted for 59.6 per cent of the world's total milk production in 2010-11. It is very much clear from Table 2 that for others countries market share of milk production has declined from 44.8 per cent in 1992-93 to 40.4 per cent in 2010-11.

The global milk production has been registered an annual average compound growth rate of 1.9 per cent during 1992-2010 which is statistically significant at 1 per cent level. It may be seen from Table 1 that during 1992-93 to 2010-11 the world's total milk production has exhibited an uninterrupted expansion. It has been increased from 525.91 million tonnes in 1992-93 to its peak of 720.87 million tonnes in 2010-11, representing 37.07 per cent expansion.

A glance at the last row of Table 1 makes it clear that during the period under analysis growth in milk production has been varied widely among countries. During 1992-93 to 2010-11, milk production in some leading producers developed nations, viz. France, UK and Russian Federation

has been decreased at an annual average compound rate of 0.40, 0.5 and 16.9, respectively. Conversely, USA, China, Pakistan, Brazil, Germany and New Zeeland have gained in output.

During the whole period under investigation, the highest annual compound growth in milk production is reported for China (11.6 per cent), followed by Pakistan (4.2 per cent), India (4 per cent), New Zeeland (3.9 per cent), Brazil (3.8 per cent) and USA (1.5 per cent).

It may be seen from the results presented in Table 2 that the USA, Russian Federation, Germany, France and United Kingdom have confronted with losing market share in the global milk production. The highest decline in market share is reported for the Russian Federation, decreases from 9 per cent in 1992-93 to 4.5 per cent in 2010-11. It is followed by France, 1.6 percentage points decline in market share during the same period. Conversely, India, China, Pakistan, Brazil and New Zeeland have increased their market shares. It may be seen from the results presented in Column 12 of Table 2 that the share of top ten milk producers has exhibited a rising trend. It provides informal evidence that competition in the global milk market is decreasing over the years.

Table 3 presents the trend in the degree of the global competition in the dairy sector, derived using Equation 2.

Table 3—Trends In Degree Of Global Competition In Dairy Sector

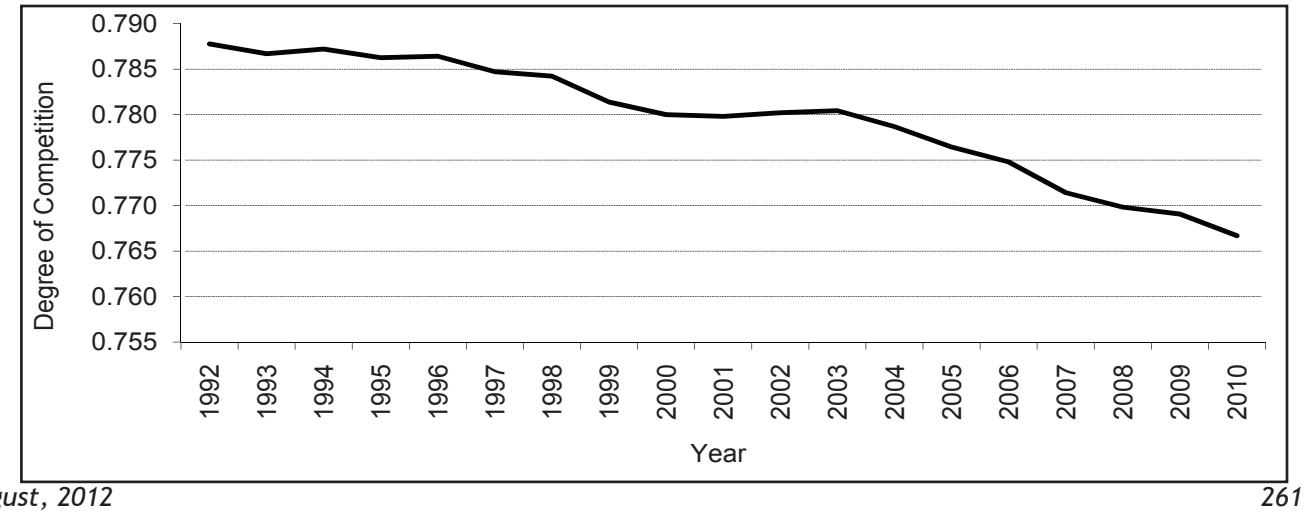
Year	$\sum m_i^2$	$\sqrt{\sum m_i^2}$	$1-\sqrt{\sum m_i^2}$
(1)	(2)	(3)	(4)
1992	0.045	0.212	0.788
1993	0.046	0.213	0.787
1994	0.045	0.213	0.787
1995	0.046	0.214	0.786
1996	0.046	0.214	0.786
1997	0.046	0.215	0.785
1998	0.047	0.216	0.784
1999	0.048	0.219	0.781
2000	0.048	0.220	0.780
2001	0.048	0.220	0.780
2002	0.048	0.220	0.780
2003	0.048	0.220	0.780
2004	0.049	0.221	0.779
2005	0.050	0.224	0.776
2006	0.051	0.225	0.775
2007	0.052	0.229	0.771
2008	0.053	0.230	0.770
2009	0.053	0.231	0.769
2010	0.054	0.233	0.767

Source: Derived using data available in Table 2.

A look at Column 2 of Table 3 reveals that over the years the control of top ten milk producers in the global milk production has been increasing. It may be seen from Column 4 of Table 3 that the degree of competition in global milk production has exhibited a steady downward trend. It declined from 0.788 in 1992-93 to 0.780 in 2000-01 and further to 0.767 in 2010-11.

In order to examine the trend in global competition over the years for detecting any change in the degree of competition in global milk production, we would like to plot the values of $1-\sqrt{\sum m_i^2}$ over the years, which may be observed in Table 3. Figure 1 more conspicuously presents the downward trend in the degree of competition in the global milk production.

Figure 1: Trend in Degree of Competition in Global Dairy Market



In view of results displayed in Figure 1, we propose to go for linear regression analysis to examine the trend. We consider the null hypothesis (H_0) that there is no change in the degree of global competition in milk production over the years against the alternative hypothesis (H_1) that there is an increase or decrease in same over the years.

Let the linear trend equation of Global Competition in milk production is represented by:

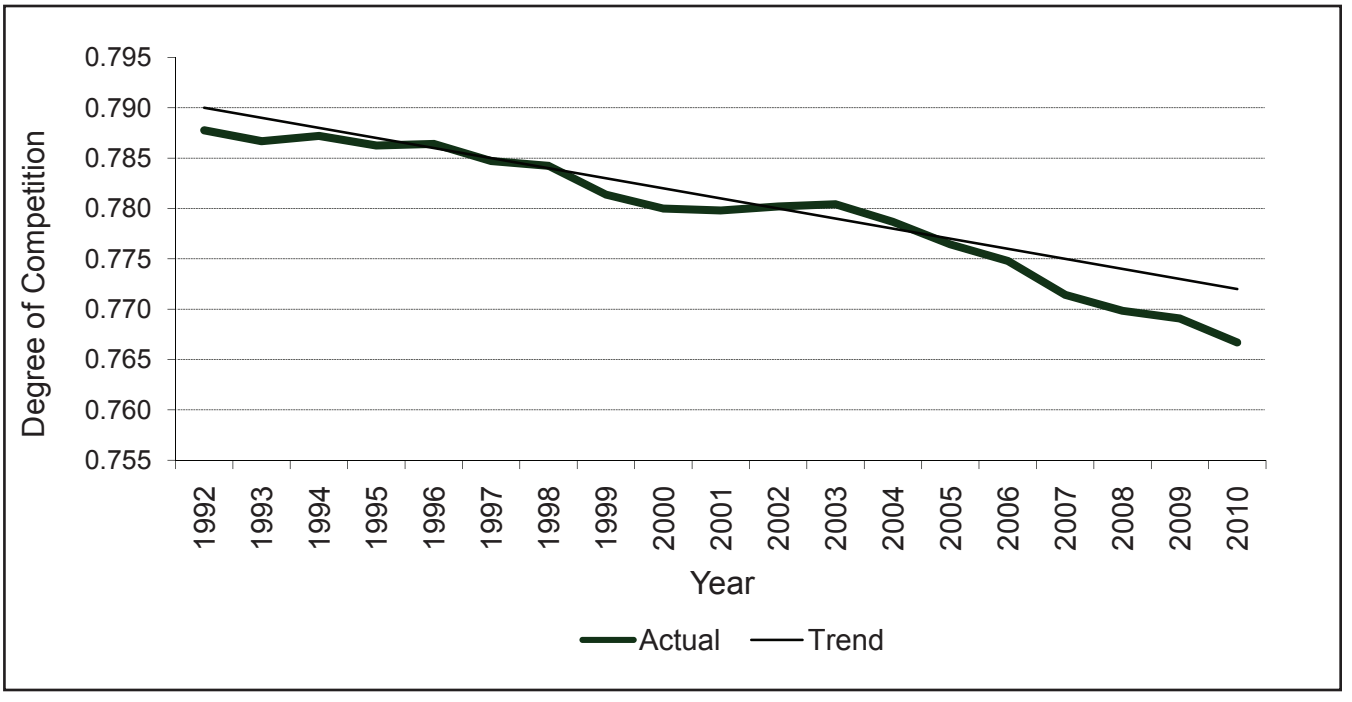
$$C_t = a + b\,t + \mu_t \quad \ldots(4)$$

where C is global competition, t is time, a and b are the regression parameters, and μ is error term assumed to satisfy all the basic assumptions of the classical linear regression model. The values of parameters a and b are estimated applying the least square method on the data presented in Column 4 of Table 3. The estimated value of a is 0.791 and that of b is -0.001. More specifically:

$$C_t = 0.791 - 0.001\,t$$

To examine the significance of b value, the regression coefficient of this linear regression curve, we like to test the H_0: b = 0 against the H_1: b ≠ 0. The student 't' test is used for the purpose. Number of observations is 18. The observed value of 't' test is -16.2 which is statistically significant at 1 per cent level. The value of R^2 is 0.939 which indicates that our model fits the data well, i.e., the linear decreasing trend equation is a good fit for the said problem. The corresponding analysis of variance provides that value of 'F' test is 262.45 which is significant at 1 per cent level. Hence we reject the H_0: b = 0. We conclude that global competition in milk sector is statistically significantly decreasing over time as the coefficient of time is negative. The trend line (Eq. 4) in the graph for the degree of competition may be seen from the Figure 2. Next, we compare the cost of milk production for the world's lowest and highest cost producers.

Figure 2: Actual and Trend Values of Degree of Competition in Global Dairy Market



Cost of Milk Production

Among the major milk producing countries milk production cost may provide a picture of each nation's comparative advantage. A general idea about India's comparative advantage in milk production may be obtained by comparing its milk production cost with that of other countries. Table 4 gives an indication about the average cost of milk production for top seven lowest and highest cost countries in 2006-07. It is evident from Table 4 that the cost of milk production differs among countries. The lowest-cost producers are located in developing and least-developed regions, *viz*. South America, South Asia and Eastern Europe. Argentina (16$) is the lowest-cost producing country, followed closely by Belarus (18$). The next 5 low cost milk producers countries are: (i) Chile (19 US-$), (ii) Pakistan (20$), (iii) Ukraine (21$), (iv) India (23$), and (v) Bangladesh (24$).

Table 4—Average Cost Of Milk Production, 2006

Low Cost Country			High Cost Country		
Country	**Cost (US-$/ 100 kg milk)**	**Cow farm type**	**Country**	**Cost (US-$/ 100 kg milk)**	**Cow farm type**
Argentina	16	170	Switzerland	86	20
Belarus	18	650	Finland	72	24
Chile	19	355	Austria	69	12
Pakistan	20	1	Norway	61	19
Ukraine	21	443	Turkey	57	4
India	23	2	Canada	55	57
Bangladesh	24	2	Germany	51	30

Source: Based on data available in International Farm Comparison Network Report (2007).

The highest cost milk producers are mainly found in the developed world with relatively high milk prices and government support via direct payments. Turkey seems to be an exception in this case. The top 7 highest milk production cost countries are: Switzerland (86$), Finland (72$), Austria (69$), Norway (61$), Turkey (57$), Canada (55$), and Germany (51$). The cost levels range from $16 in Argentina to $87 per 100 kg milk in Switzerland. In fact, milk production cost in Switzerland is 5.4 times higher than in Argentina.

India ranks sixth in low cost milk producers. Its average cost of milk production, for a farm of two cows in Panjab state, is reported US$ 23 per tonne. It may partially be attributable to the feeding system, technology and management skills. On the basis of inter-country comparison of milk production cost, it may be concluded that India has the comparative advantage in production of milk.

Table 4 also demonstrates that average farm types show a significant range in size. Belarus has the world's largest size cow farms. India's representative farm size is found with two cows. It is the second-lowest farm size after Pakistan. We now present a comparison of local conditions in Indian dairy industry vis-à-vis European Ones.

India's Dairy Sector vis-à-vis European Ones

In terms of cost of milk production, India is a competitive producer. Indian dairy farming is basically a smallholder production system. Indian farmers maintain, on an average, a herd (cow and buffalo) of two to three dairy species. More than 40 per cent of Indian farming households are engaged in milk production as this is a livestock enterprise in which they can engage with relative ease to improve their livelihoods. Growth of the dairy sector in India is demand-driven, inclusive and pro-poor.

On the other hand, the Europe has an average farm size of more than 31 cows (European Commission, 2011). And the main aim of dairying is to generate expected returns on investment. Dairy farmers own the majority of processing capacity in the Europe. In India, there exists a long chain of intermediaries in milk processing system which adversely affects the quality of milk marketed and increases the cost of dairy products. However, quality and safety standards in domestic and export value chains are managed through a number of regulations and implementing authorities like Agricultural and Processed Food Products Export Development Authority.

Given India's herd size at extremely low level, considerable economies of size may be gained. The European dairy industry is very dominating in the world market and is leading exporter of many dairy products, most notably cheese. Contrary, despite the world's largest producer of milk, India is not a significant exporter of dairy products. The European dairy industry has been transforming yearly about 77 per cent of its total raw milk into a broad range of dairy products, both for consumption and for application in the production of many foods, feed and Pharma products. While in India milk is consumed mainly in raw form and only 35 per cent of total milk production is processed, a large proportion is converted into traditional products in the unorganized sector such as cottage cheese, ghee, cottage butter, khoya, curd, malai, etc. European countries provide high export subsidies to their dairy producers, whereas Government of India (GoI) often bans exports of dairy products. For example, in February

2011, GoI has imposed ban on exports of milk powder and its derivative casein to rein in rising prices in the domestic market.

European dairy farms are generally large specialist commercial farms. Contracts and commercial relationships in the supply chain are highly developed and milk producers' organisations utilize the collective bargaining power. In India, the unorganized sector still dominates in milk production, processing and distribution. Markets for dairy products are, by and large, unorganised, traditional and fragmented. The infrastructural facilities for collection and transportation of milk are quite poor. Milk procurement price is either on fat basis or on fat-and-SNF (solids-not-fat) basis.

In the Europe, cow is the major species for milk production while in India 53 per cent of total milk is produced solely by buffaloes. Seasonality in milk production is well-known in the Indian dairy sector and is more pronounced for buffaloes. The average milk yield of Indian cow is only about 3.4 kilogram a day against the Europe's average of 18 kilogram a day. It may be added here that Finland has achieved cow yield as high as 23 kilogram a day. There appears to be considerable scope for improving India's dairy farm performance by increasing the yield of dairy animals.

Indian dairy farming has been adversely affected by high prevalence of various animal diseases like foot and mouth disease, brucellosis, classical swine fever. To foster the dairy development in the country, adequate veterinary disease diagnosis, epidemiology, hospitals infrastructure and technical manpower need to be developed. It may be noted here that the European dairy industry is characterized by an oligopolistic market whereas Indian dairy industry is moving towards the perfect competitive market. Dairy products marketing in India is mainly through door to door sale which needs to be changed to supermarkets sale in large quantity as in case of Europe, since large numbers of urban and rural households have refrigeration facilities at home. From our foregoing analysis, it may be concluded that the European model may be used as a benchmark in strengthening milk farmers for increasing farm size and building own processing capacity.

Summary, Main Findings and Policy Implications

The study has measured the extent of competition in the global dairy sector. Based on global competition, time series analysis has been carried out to find past trend and future direction. The position of India has been examined along with of a few other leading milk producers. The analysis indicates that over the past two decades the global competition for milk production has witnessed a downward trend. Whereas, India has maintained a steady rise in milk production market share. This indicates an opportunity for Indian dairy industry. The market shares of milk production of USA, Russian Federation, Germany, France and United Kingdom have decreased. China, Pakistan, Brazil and New Zealand have gained in market share. In this context, the cost of milk production, farm size, infrastructure for milk collection, milk processing capacity, quality of dairy products, etc. have been highlighted to gain global competitive advantage. In terms of cost of milk production, India is a competitive producer. To meet the demand of the increasing population milk production in India has to be increased. In addition, there is a need to manage Indian dairy industry in a manner to enhance the production of dairy products and upgrade milk processing using innovative technologies.

Our results confirm that the Indian dairy sector is competitive and has achieved a remarkable progress during the last two decades. The policy implication of this finding is that to spur the production of dairy products the further liberalization of dairy products export policy is highly desirable.

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A Note on Agrarian Structure and Crop Holiday Movement in Konaseema Region of Andhra Pradesh

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I. Introduction

It was for the first time in the country's agricultural history! The farmers in the Konaseema Region of East Godavari District-which tops the development index in State of Andhra Pradesh- declared for themselves, a crop holiday in nearly one lakh acres of land, during the Kharif season, in 2011. The main reason for this crop holiday was that there is huge difference between the cost of cultivation and the returns; it means the cost of cultivation is more than the returns and the amount risk involved has increased. There are, however two additional reasons: first, the farmers are facing region-specific problems such as mono-crop cultivation, high usage of chemical fertilizers, cyclones, floods and irrigation is not under the control of the farmer. Second, farmers of all regions are facing common problems such as frequent increase in input prices, lack of access to institutional credit, low Minimum Support Price (MSP), etc.

In recent years, the cost of cultivation has increased; for example, for one acre of paddy the cost of cultivation is Rs. 21050, while the return is only Rs.19575. Hence, the farmers end up with huge losses. There are many reasons for the increase in the cost of cultivation: rising input prices, increased rates of interest, high labor wages and shortage of labor because the agricultural laborers are involved in two or three different occupations, including wage labor, tenancy, non-agricultural activities, and MGNREGS works; as well as lack of procurement facilities. These are the major causes that led to the crop holiday. Though these are general problems faced by all the farmers, those who cultivate in dry land areas are facing more problems than in the coastal region. Hence, one wonders why the farmers in the dry region have not declared a crop holiday, and why those in the Konaseema Region, who are much better off than the farmers in the other regions in Andhra Pradesh, did. The present study will answer the above questions with the help of the existing agrarian structure in the region.

II. Who Declared Crop Holiday and Why?

The nature of ownership on land and agrarian structure is a more relevant reason for the declared crop holiday in Konaseema. Some studies show that though the big landowners have moved to urban regions, they have not left their ownership rights on agricultural lands. They invest the agricultural income in the non-agricultural sector for better earnings, and for their children's education. Some farmers have expressed that agriculture is not remunerative and the yield has become stagnant; hence, they are forced to move towards the non-agricultural sector.

In Konaseema, the majority of the cultivable lands are operated by small, marginal and tenant farmers. Earlier, the large landowners in the village hired wage labor or permanent labor. Hence, most of the landless, small and marginal farmers had employment. Recently, however, the majority of the rich peasants have shifted towards non-agricultural activities in urban areas; and agricultural laborers lease-in their lands for cultivation as tenants. Now, these farmers' main livelihood is tenant cultivation, rather than wage labor. How can these sections, cultivating more than 92 per cent of the total landholdings, go for a crop holiday? Furthermore, if they decide to go for a crop holiday, how they can survive, because cultivation is their main source of livelihood? And what about the tenants who cannot declare crop holiday because they do not have right over the land?

The present study focuses on some of the relevant reasons for crop holiday

Absentee or non-resident landowners are increasing over the years (Vijay, 2012). Majority of the cultivable lands are now under the non-resident landowners. They are leasing-out lands to the landless, marginal and small farmers, who get easy access of leased land without any household resource except labor power. Their major occupation is tenancy rather than agriculture labor. Non-resident landowners can afford to go for a crop holiday because cultivation is not their main source of income. In fact, they earn more from non-agricultural activities than their agriculture rental income. Besides, the resident large landowners can also live without paddy cultivation because they also have income from their coconut fields or some other non-agricultural activities in which they invest. But how can the small/marginal and tenant farmers sustain without cultivation in the region? Who does the crop holiday impact ?

The marginal, small and tenant farmers are suffering more for their livelihood. There is evidence that the landowners are willing to give up cultivation, but they do

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not prefer to lease-out their land to tenants after the Government issued credit cards. The non-resident landowners wish to increase the rental value of their lands, and they are afraid that they might permanently forego their rights on their land if the Government provides benefits such as a credit card and subsidies to the tenants, besides granting them the status of a cultivator in the Government records. However, the non- resident landowners, input traders, moneylenders, millers, and marketing intermediaries have benefited through supply credit, and inputs for higher interest rate to the poor peasants and tenants.

The Krishna-Godavari Delta Region has many specific problems, as discussed above, though it has achieved better development in terms of agriculture compared to the other regions in Andhra Pradesh. These farmers cultivate for three seasons and their productivity is much higher compared to Rayalaseema or Telangana. Hence, the farmers of this region are better of compared to the farmers in the other regions; especially those from the dry regions, who cultivate only for one season. Moreover, the farmers in the dry regions depend on the rainfall-if there is not adequate rainfall, they do not sow; hence, the yield extensively depends on rains, and there is high risk involved; however, if there is assured irrigation, the expected returns might be constant. Though the Government has been investing more on irrigation projects, these allocations are biased-a big part of allocations goes to the agriculturally rich areas only in Andhra Pradesh.

III. Agrarian Trends in East Godavari

In 1961, about 11.3 per cent cultivators were provided with employment for 17.1 per cent of the agricultural holdings in the district. However, the proportion of the cultivators has been declining over the years, from 11.3 per cent in 1961 to 4 per cent in 2001; while the proportion of the total agricultural holdings has been increasing over the period, from 17.1 per cent in 1961 to 20 per cent in , 2001. The big landowners were a major labor-demanding segment in the agrarian economy. The data from the Hand Book of Statistics of 2005-006 shows that there are 92.15 per cent small and marginal farmers cultivating 62.4 per cent of the land in East Godavari. The rest of the land (38.6 per cent) is owned by medium and large farmers, i.e., about 7 per cent of the households. In the mandals in Konaseema where the crop holiday was declared, more than 95 per cent of the farmers have marginal or smallholdings; and 75 per cent of the cultivated land is under them. In these mandals, medium and large farmers are less than 2 per cent, but own 20 per cent of the total cultivated land. Though the proportion of big landowners is very small, they own more amount of land. Between the 1950s and 60s, all farmers received permanent rights on lands, after the abolishing of the Zamindari system in India. Further, after the Green Revolution in the 70s; which might be the result of technological reforms in the region, the farmers used the new technologies to enhance productivity, and agriculture became more profitable. During this period, land under tenancy was very less. This resulted in traditional inputs being replaced by the modern inputs such as HYV seeds, bio-technically engineered seeds, fertilizers, pesticides, and agricultural implements such as harvesters, etc. Adoption of new technology increases self-cultivation, and as productivity increases, the average farm income increases significantly. As a result, the proportion of absentee landowners as well as tenants decreased in the region. Hence, the subsistence economy, which starts producing for the market, and agriculture, became more profitable.

However, after the 90s, productivity became stagnant, and agriculture was no more remunerative. Hence, farmers shifted to non-agricultural sectors, and after 2000, the farmers decided to search for other alternatives because agriculture was not at all remunerative. In this process, many farmers shifted to urban areas. As Vamsi, et, al (2011) observe in their study, there was a significant shift of capital into Hyderabad towards various urban enterprises. However, the landowners who moved to non-agriculture did not lose their permanent rights on agricultural lands. This is the main reason for the generation of more leased-in land in this region.

Moreover, the implementation of land reforms in the district turned out to be a major failure. For example, 45 per cent of the landless still exist in the district. In other words, during sub-division of landholdings among class, the number of self-cultivators was reduced and the landless got access to land in the form of land lease. However, this was not reported in any data, but some micro-evidence shows that tenant holdings constitute about 75 per cent of the land to the total landholdings in the region (Vamsi, et, al 2011; Land Committee Report, 2006; Mohan Kanda Report, 2011). In 2005-06, about 71 per cent of the Dalit households in the rural areas of East Godavari did not own any land other than their homesteads.

Another important issue regarding absentee landowners is that their percentage was high and increasing continuously over the years as agriculture was not remunerative. However, about 95 per cent of the land is under the control of small and marginal farmers, and their dependence on agriculture for livelihood has neither fallen nor shifted to the non-agricultural sector over the years. This is the main reason for the sharp fall in the state's income from agriculture. They might not be in favor of market-oriented production. A majority of the produce is used for self-consumption rather than for being sold in the market. They are supported by.informal institutions in all agricultural operations.

IV. Absentee Landlordism

The number of non-cultivating landowners is high in the Konaseema Region-residents as well as non-residents. The majority of the cultivable lands under non-

resident owners are big owners who own land in many villages, while some are traders/commission agents who live in neighbouring towns (market centers), and some live in cities for the purpose of their children's education and are actively involved in non-agricultural activities such as real estate, film industry, and other serving sectors. These people collect rent (in kind) during the harvesting time. Though absentee landlordism does not contribute to agricultural productivity, most of the tenants lease-in land from non-residents. This indicates that there is no risk-sharing between the tenants and the landowners; and if any, the risk is faced only by the tenant as the landowner is absent.

In the canal-irrigated areas, ownership of land is restricted to less than 50 per cent of the households (Parthasarathy and Prasada Rao, 1969). This means that more than 80 per cent of the households are landless agricultural labor (non-land owners). Such unequal distribution of ownership is found to generate a demand for land among the large number of landless and small farmers. As ownership is concentrated among a few non-residents, it leads to more number of tenants in this situation, the proportion of non-residents leasing-out land is high, and it is bigger in size (60 per cent of the total cultivatable land)-this information is informal and not reported. The report of the state level committee to study the problems of farmers in the crop holiday mandals of East Godavari District, AP (2011), under the chairmanship of Mohan Kanda stated that an informal tenancy system is predominant in these areas and it accounts for nearly 50-60 per cent of the sown area. Similarly, the Land Committee Report (2006) under the chairmanship of Koneru Ranga - Rao also stated that about 55-60 per cent of the cultivated lands are leased-in; they studied the villages in East Godavari, Krishna and Guntur districts.

V. Poor Peasant Economy

India is now an agrarian society where 63 per cent of its producers own holdings of less than one hectare of land. The structure of landholdings is pear shaped (Barbara Harris White and Alpashah, 2011). Moreover, the NSS (2003-04) data analysis reveals that only a little over 5 per cent of the producers own more than three hectares, while only 0.52 per cent own more than 10 hectares of land. Thus in many parts of the country, agricultural bondage and attached labor have significantly declined, if not disappeared, while casual wage labor has increased. Tenancy has declined, according to NSSO 2003-04 - only 6.5 per cent of the operated land was found to be under tenancy. Tenancy can be part and parcel of the capitalist-social relations, where people who have risen up against the class hierarchy no longer wish to till their land themselves.

It is observed that multiple livelihood options are necessary for the sustenance of rural households. Thus, the rural economy has developed in complex ways. What are the means by which rural households reproduce themselves, and what kinds of differentiation might result. Mostly the petty commodity producers are extremely vulnerable, struggling to survive/sustain themselves in conditions where they cannot grow, and any surplus is accidental. "Challenges for Revival of Indian Agriculture", by Mahendhra Dev (2008) pointed out that most of the fertilizer, irrigation and power subsidies go to the developed regions and to the large farmers; the small and marginal farmers are not among the beneficiaries of these development schemes. Furthermore, rural banking is not in favor of the small and marginal farmers, tenant farmers, and other vulnerable groups. Narasimha Rao and K C Suri (2006) studied the dimensions of agricultural distress and found that about 70 per cent of the farmers have borrowed from the fertilizer/pesticide traders at 24 per cent interest rate during the cropping period. The small and marginal farmers are forced into the wage market because of their insufficient holding size (Rao, 2007). A few years back, a NSS survey highlighted that over 60 per cent of the farmers prefer to opt out of agriculture if they had an alternative. The Book, *Five Big Questions about Five Hundred Million Small Farms*, by Peter Hazel (2011), has pointed out that smallholding development is one of the main ways to reduce poverty. The present challenge is to improve the working of markets for output, input, land and financial services, and to overcome market failures that discriminate small farmers.

Structurally, in Konaseema, agriculture is known to be essentially poor peasant and tenant farmer based. The poor peasants account for 92.15 per cent of the total farm households, with 62.4 per cent area operated in contrast, large farmers comprise only 0.15 per cent of the total households, with 3.6 per cent of the operated land in Konaseema. Tenants account for 75 per cent of the total farm households, and around 45 per cent of the area of total cultivable land, which was not reported in the official records.

According to the Agricultural Censuses, there is a huge increase in marginal holdings, with small units of land, i.e., below 1 hectare, in East Godavari District of Andhra Pradesh. In 1976-77, there were 60.8 per cent marginal holdings, which increased to 78.9 per cent in 2005-06. Family division is one of the reasons for sub-divided lands, while another reason, not reported is that the big landowners leased-out land to the landless and small farmers. The Land holding data shows that large holdings declined from 1.6 per cent in 1976-77 to 0.15 per cent in 2005~06; while medium holdings declined from 7.6 per cent to 1.8 per cent; semi-medium holdings declined from 12.7 per cent to 5.8 per cent; and small holdings declined from 17.3 to 13.7 per cent in the Konaseema Region. We observe that there is a marginal decline in smallholdings, compared to other size holdings.

The Hand Book of Statistics, East Godavari, shows that marginal holdings accounted for more than 80 per cent; while large holdings accounted for less than 0.3 per cent, and the marginal and small holdings put together, accounted for more than 94 per cent in all Konaseema mandals. Among all categories of holdings, only the poor peasants and tenants operate more than 92 per cent of the land - this is a significant amount of area. The nature and ownership of land is determined by the pattern of tenancy. When there is more land owned by absentee landowners, there is a high possibility to generate an informal pattern of tenancy. The share of leased-in land to the total land is very high [constitutes about 55 per cent; see Land Committee Report, (2006); this can also be reported in the other studies conducted in the region]. The high proportion of informal tenancy system is one of the major causes for the crop holiday movement in the Konaseema Region. This is due to the predominance of poor peasants and tenant households, as well as the area operated in the region, which is far more dominant in the coastal region in the state as well as in the rest of the country. The land distribution is highly skewed and uneven; and the bottom 92.15 per cent of the households account for 62 per cent of the total operated area.

The average size of marginal and small holding farms is very low and cannot generate adequate employment and for their sustenance, if they depend only on crop cultivation (Haque, 1992). Hence, they are willing to take available land on lease for cultivation, as they do not undertake other farm or off-farm activities. The farmers, particularly small and marginal farmers,'.do not have the ability to invest in agriculture; due to this there is high investment and labor input: According to VS Vyas (2007), there is stagnation in agricultural productivity and production. At the same time, there is also stagnation in the prices of output, and rise in the prices of the agricultural inputs over a period. This has seriously affected the economy of a large number of marginal, small and tenant farmers, and so some landowners have shifted to non-agricultural activities. All landless agricultural laborers, female laborers, small, marginal and tenant farmers depend on agriculture for their livelihood. There are a number of small, marginal and tenant farmers committing suicides even in agriculturally progressed areas such as in Andhra Pradesh. This section of peasants has low income, lower capacity, and weak assets. They cannot bear sudden shocks in agriculture and their capacity to participate in the development process is very low.

Land is one of the proxies for the asset base of rural households, and a very important factor to transmit the rural economy. In the Konaseema Region, the landless easily access land through the land lease market on the basis of fixed rent. In this region, such transactions are very common, giving the landless labor access to lease land. Majority of the landless, small and marginal farmers have leased-in land from absentee landlords. However, purchase and sale of land is very limited. The poor peasants use family labor in all operations, though exchange of labor or reciprocal labor also takes place among the cultivators. All these categories more or less depend on labor power for their livelihood rather than cultivation. Such sections were affected in two ways during the crop holiday: One, they could neither cultivate their own land nor lease-in land. Second, there was no employment available in the village. Hence, implementation of the Community Managed Sustainable Agriculture (CMSA) model is recommended for a sustainable poor peasant economy in the long run.

V. CMSA for Long-Term Sustainable Agriculture

Two things are mandatory for sustainable agriculture: first, long-term protection of land rights for small, marginal and tenant farmers; and second, to ensure sustainable agricultural practices in order to reduce huge difference between cost and returns, as well as risk in cultivation. For this, it is necessary to regulate supporting institutions such as micro-credit, marketing, and labor adjustment; and reduce the use of pesticides and fertilizers. Furthermore, informal institutions must be controlled, and the small farmers' institutional set up must be strengthened.

Long-term initiatives are needed for sustainable agriculture in Konaseema .as well as in India. If small and marginal farmers are sustained in the state, it leads to sustainable agriculture in the state because more than 82 per cent of the farmers are either poor peasants or tenants. Hence, it is important to provide long-term measures to solve the problems in agriculture, leading to sustainability in agriculture. Extension should be provided to farmers at the village level through community support. It is observed that community managed sustainable agriculture is getting good response from the local small farmers. Hence, by implementing the CMSA, landless people also get employment opportunities at the village level (preparing the organic methods).

Helping the poorest of poor is also a main component in the CMSA. Through this scheme, half-acre land, one cow and one weeding machine are provided to the landless families, which are encouraged to cultivate using the CMSA practices. This helps increase the net income and to improve and sustain the agriculture-based livelihoods. Any Government policy should be in favor of small farmers who are dominant in agriculture in the Konaseema Region.

In order to reduce the risk in cultivation, and to sustain the incomes of the rural poor as well as soil fertility, the following measures should be taken:

- Identification of small/marginal farmers, tenancies: for this, these farmers are formed into a unit—the SMTFU (Small, Marginal and Tenancy Farmers Unions) at the Panchayat level, complete with its chosen president, vice president, and secretaries.

- The Government should engage one 'Resource Person' to each unit at the Panchayat level.
- MandaI level agriculture officers should work in association with this union. This is a must in the Konaseema Region.
- In the villages, farmer SHGs must be formed for credit and for other benefits; this makes it easy to hire agricultural machinery from custom hiring centers.

VI. Conclusions

In this study, we found that cost of cultivation and the value of rent have been increasing due to informal systems around the farmers, such as absentee landowners, moneylenders, input traders, and millers. The following might be the reasons that led to the crop holiday in the Konaseema Region of Andhra Pradesh:

- The proportion of non-resident landowners is high, and more than 60 per cent of the cultivable land is controlled by them. They played a major role in the declaration of crop holiday in this region, as well as in the increase of land rent and the MSP.
- As a result, the landless labor population increased, leading to greater unrest, and a sense of public injustice, in the rural areas such as the Konaseema Region.
- The big landowners' proportion has declined and poor peasant economy has risen in agriculture.

Our opinion is that the Government should implement effective and equitable land tenure systems, along with creating more transparent systems for registration, tracking and protecting land rights, in particular for the small, marginal, women and tenant farmers—these are vulnerable groups that depend on small plots of land for their livelihood. The Government must protect the tenant's land rights, tenure, etc., and should ensure optimum use of resources, and that the farmers strive towards improvement of their productivity as well as conservation. The tenants must be encouraged to manage land for long-term advantages rather than short-term expediency. Furthermore, land and water should be provided to the marginal and tenant farmers in a sustainable and equitable manner.

CMSA is a Government initiative, which would lead to sustainable income for the rural poor, while the sustainability of soil fertility and agriculture will be positively impacted in the long run in favor of small farmers and tenants. Such measures should be initiated in the Konaseema Region, so that the agricultural scenario is dominated by the poor peasants. In CMSA, the farmers use locally available resources as inputs, instead of the high price chemical fertilizers. In villages practising CMSA/ NPM, it is observed that the farmers' net income as well as the productivity has improved. CMSA implements the poorest of poor strategy, due to which the landless people are particularly benefited. Agriculturally viable measures should be initiated by the Government through the CMSA in all villages in Konaseema as well as in Andhra Pradesh. This will have long-term benefits, and would result in sustainable agriculture.

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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.

Impact of NREGA on Wage Rates, Food Security and Rural Urban Migration in Uttar Pradesh

Introduction

India is basically an agrarian country. More than 80% population of the country resides in rural areas and their livelihood is agriculture. The availability of cultivated land has been reducing year by year due to expansion of urbanization and industrialization Since, the commencement of mechanization in agriculture, the opportunity of employment in agriculture is also coming down year by year. The disguised employment is also found very much in agriculture sector. The employment opportunity in agriculture is also seasonal. It does not provide the employment to rural work forces through out the year. On account of this, the migration of rural workforces from rural areas to cities was common phenomena. Also even after more than 60 years of independence in India almost 80% of its population suffers from malnutrition and availability of food grains per capita has reduced as compared to same during 1950s. More than 80% of total farmers of the country are small and marginal. Apart from this, a large of chunk of rural households are also landless and their economic condition is very deplorable.

The elimination of poverty from rural workforces to provide gainful employment was main agenda of Government of India. In the light of above Government of India has launched a landmark National Rural Employment Guarantee Act (NREGA) on 7th September 2005 across the country. This Act has been renamed as the Mahatma Gandhi National Rural Employment Guarantee Act in December 2009. The aims of NREGA was to enhance livelihood security of households in rural areas of the country by providing at least 100 days of guaranteed wage employment in a financial year to every households whose adult members volunteer to do unskilled manual work at a statutory minimum wage rate. The NREGA was implemented in phased manners in India. In 1st phase, i.e. 2006, 200 most backward districts of India were covered. In 2nd phase, i.e. 2007-08, 130 more districts were covered under NREGA. In 3rd phase i.e. 2008-09, all the remaining districts of country have been taken under preview of NREGA. As per record of 2010-11, 1.45 billion days of employment to 41 million rural households of India were benefited under NREGA. Of total employment of rural population under NREGA, the share of females accounted for 50.3 per cent. The share of SC and ST households was about 50 per cent. Past studies show that impact of NREGA was very positive on different fronts in rural areas of India. It has increased the bargaining capacity of the poorest of poor at every stage from demanding a job cards to ensuring legitimate wage for work. It is also fruitful in stopping the migration of rural workforces. However, the wage employment programmes in different names had been launched in different years since 1 960s in India, which could not yield good result in providing sufficient employment to rural.masses. Among the wage employment programmes the NREGA has been found more successful to increase the level of social security to villagers and creation of productive assets. Even then there was a need to evaluate the performance of programme on the basis of different provisions of the NREGA Act. The present study is a modest attempt to asses the impact of NREGA on wage rates, food security and rural urban migration in the selected districts of Uttar Pradesh.

Main Objectives of the Study

The present study on **"Impact of NREGA on Wage Rates, Food Security and Rural Urban Migration in U.P."** has been conducted with the following objectives :—

1. To measure the extent of manpower employment generated under NREGA, their various socio-economic characteristics and gender variation in the sample districts of U.P.
2. To compare wage differentials between NREGA activities and other wage employment activities.
3. To study the effect of NREGA on the pattern of migration from rural to urban areas.
4. To find out the nature of assets created under NREGA and their durability.
5. To identify factors determining the participation of people in NREGA Scheme and whether NREGA has been successful in ensuring better food security to the beneficiaries.
6. To assess the implementation of NREGA, its functioning and to suggest suitable policy measures to further strengthen the programme.

Data and Research Methodology

The present study is based on both primary and secondary data. The sampling design given by the co-ordinator Centre of the study (ADRT Banglore) has been totally adopted for the selection of districts, villages and respondents. The primary and secondary data has been

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gathered from different sources. For collecting the primary data, multi stage random sampling method was followed for the study, NREGA has been implemented in three phases in the state of U.P. as well as whole country. In Uttar Pradesh, 22 districts in first phase, 30 districts in second phase and 20 districts in third phase have been taken for the implementation of NREGA. For the present study five districts namely Saharanpur, Etah, Barabanki, Allahabad and Kushi Nagar belonging to different phases and located at north, west, central, south and east part of the state have been selected. These five districts are selected in such a manner that they could represent whole state to the maximum possible extent. From each selected district after consulting with the concerned government officials two villages were selected by keeping account, that one village is located around 5 Km from the distance of district head quarter or main city/ town and another village is in farther location of 20 Km. or more from the distance of district head quarter or main city town. From each selected village 20 beneficiaries (working as NREGA worker) and 5 non-beneficiaries (working as wage employee other than NREGA) have been selected. For the selection of respondents a complete list of the households having job card and working in NREGA and other than NREGA work was prepared for each selected village alongwith the caste wise information of the workers. Aftcr the prepared list of workers stratified random sampling method was adopted for selection of the respondents giving proportional representation to the caste i.e schedule caste, schedule tribe, other backward caste and forward caste. A due representation was also given to the women respondents.

The primary data for the study were collected through personal interview method. Information regarding demographic profile, main occupation, income structure: consumption pattern, mobile and immobile property etc. were gathered together. Secondary data for the study was collected from the website of the National Rural Employment Guarantee Act 2005 of the Ministry of Rural Development, Government of India.

Thus, in all 5 districts 10 villages, 200 beneficiaries and 50 non-beneficiary's samples were the basis of the present study. Table-1.1 presents information about the sampling design.

TABLE 1—SAMPLING DESIGN

Districts	Phase	Location in the state	V illage-I Name	NREGA	Non-Nrega	Name	Village-II NREGA	Non-Nrega	Total
Saharanpur	III	North	Kakarhui	20	5	Kularkikhard	20	5	50
Etah	II	West	Nagala Pawal	20	5	Ram Nagar Jalalpur	20	5	50
Barabanki	I	Central	Barauli	20	5	Semari	20	5	50
Allahabad	II	East	Dhobahat	20	5	Kaundi	20	5	50
Kushinagar	I	East	Khirkiya Dubey	20	5	Danda	20	5	50
Total				100	25		100	25	250

Reference Period—The reference period of the study was 2009.

Major Findings of the study

The major findings of the study have been discussed as follows :—

Man power Employment Generated under NREGA in Uttar Pradesh and its Socio Economic Characteristics

The perfonnance of NREGA in the state is analysed for the years 2008-09.2009-10 and 2010-11.The total expenditure on NREGA was Rs. 356887.7 lakhs in 2008-09 which has increased to Rs. 590003.9 lakh in 2009-10, showing 65.32% increase over the period. It shows that expenditure on NREGA has been increasing year by year in U.P. The progress work under NREGA was quite satisfactory. As far as the total work in progress is concerned were 251328 in 2008-09,684019 in 2009-10 and 926175 in 2010-11 Total numbers of job-cards issued to the households were 1065018 in 2008-09, which has gone up to 1305250 in 2010-11 showing 22.56 per cent increase over all period. It reflects that. issue of job cards has been increasing from year to year in U.P.

The employment demand by households over the period was 4338490, 5667644 and 6581786 against provided. employment of 4336466, 5483434 and 6431213. The households which had completed 100 days of works in the state were 647525 in 2008-09 while it has declined to 600559 in 2010-11.

It is observed that households completed 100 days of work has increased to 796929 in 2009-10 from 647525 in 2008-09, which has sharply declined by 7.25 per cent in 2010-11 over the base year of 2008-09.

TABLE 2 —AN OVERVIEW OF NREGA IN UTTAR PRADESH

Performance indicators	2008-09	2009-10	2010-11
Total Expenditure (Rs. Crores)	356887.7	590003.9	367447.4
Total Work Taken (Nos.)	295918	801746	1527960
Total work completed (Nos.)	1617	5890	319889
Total work in proeress (Nos:)	251328	684019	926175
Total Job Cards Issued (Nos.)	10652018	11698780	13052850
H.H. Demanded Employment (Nos.)	4338490	5667644	6581786
H.H. Provided Employment (Nos.)	4336466	5483434	6431213
Cumulative Person Days Generated (in Lakhs)	2272.21	3559.23	3349.01
Cumulative Nos. of H.H. Completed 100 days of work	647525	796929	600559

Source: The Mahatma Gandhi National Rural Employment Guarantee Act, U.P.

Total Employment Generated and Various Socio-Economic Characteristics

Of the total 13052850 job-cards holders, the schedule caste accounted for 47-85 per cent followed by 0.93 per cent and 51.22 per cent of ST and other castes respectively. Among all the districts of U.P., Sitapur district had issued highest job cards being 3.58 per cent followed by 3.29 per cent in Lakhimpur Khiri district. As far as job-cards issued to SC is concerned, V aranasi district stood at first place (97 .790)- followed by Kanpur district (69.91 %) Sitapur district obtained first place in demanding 255303 mandays followed by Barabanki district demanding 211234 man days. Out of 72 districts of U.P., 13 districts could not be provided 100 per cent employment to their households. During 2009-10, the total housedholds of 5667644 had demanded employment of which 96.74 per cent had received employment under NREGA. This is good sign of success of NREGA in U.P. As far as the number of mandays generated is concerned, the share of men was 78.33 per cent against share of 21.67 per cent of women. A total of 10652018 job-cards had been issued to households during 2008-09 of which SC households accounted for 50.72 per cent followed by 48.42 per cent belonged to other castes.

Projects Completed and Progress under NREGA

The projects have been classified into following manners under NREGA.

I. Rural connectivity II. flood control, water conservation and harvesting III. Drought proofing IV. provision of Minor irrigation facilities V. Renovation of Traditional water bodies VI. Land development Rajeev Gandhi Centre etc. Among the SC project, a total of 133589 projects of rural connectivity were completed, which stood at first place. The water conservation and harvesting projects being (27571) were completed which stood at the second place. The least number of projects completed were projects of Rajeev Gandhi Centre. It shows that the projects of rural connectivity had received first job-priority in NREGA in U.P. Of all the districts of 72 of U.P., Jhansi and Sitapur districts were found top in the completion of number of projects under NREGA.

District-wise Expenditure in Work Completed and under Progress in NREGA

The maximum expenditure was incurred on rural connectivity works followed by water conservation and harvesting works. Thus, it may be concluded with this impression that the rural connectivity components have an important place within NREGA activities. The district-wise analysis shows that Jhansi district was on top as highest amount of Rs. 9731614 was spent on completed projects while Sonbhadra district was on top in expenditure of Rs. 2,17,83 114 on the completion of ongoing projects.

Social Auditing and Inspection of NREGA Works (2008-09 to 2010-11)

The study reveals that more than 20 such districts where 100 per cent social auditing was done. The number of GPs socially auditing were found to be highest i.e. 4928 in Gonda district against the lowest i.e. 20 Gautam Bhudha district in 2009-10. The Maximum social audits were done in Baharaich and Gonda districts till the Year 2010-11. While Gautam Budha Nagar was the district wherein minimum social audit were done till 2010-11. Regarding inspection conducted during same span period i.e. .2008-09 to 2010-11 reveals that maximum inspections at district level were conducted in Kushinagar districts followed by Unnao district at block level.

The analysis also reveals that Kushinagar, Unnao, Kanpur Dehat and Pilibhit districts of the state were found more keen for NREGA works during the span of 2008-09 to 2010-11.

NREGA Payment Processed through Banks/Post office during 2008-09 to 2010-11

The wage payment was disbursed through banks and post offices. The number of bank accounts opened during 2008-09 was 5715193 which has gone upto 8441261 during 2010-11, showing 47.70 per cent increase over the period. The individual bank accounts were much higher than joint bank accounts in NREGA in the study period. The number of post office accounts was 120808 during 2010-11 which was more being 148402 during 2008-09. Out of total disbursed amount of Rs. 330820 lakh during 2010-11, 98.53 per cent was disbursed through banks against 1.47 per cent through post offices. Thus the banks were more access to wage workers of NREGA than post offices in U.P.

Unemployment Allowance Paid in Lieu of not Providing Employment during 2009-10

Of 72 districts of U.P. only 13 districts were found that unemployment allowance due in term of man days. The highest allowance i.e. for the 11285 man days was due in Sitapur district against lowest for 33 man-days in Azamgarh, Allahabad and Kashi Ram Nagar districts during 2009-10. It shows that unemployment allowances were due in few districts of the State. Regarding the payment of employment allowance, this was not paid by any district of the state in the study period.

Effect of NREGA on Households Income and Consumption Pattern

Data related to profile of the respondents and their income, consumption pattern etc were collected from 200 households of NREGA beneficiaries and 50 non-beneficiaries. The over age size of household member was 4.15 in case of beneficiaries. The average number of earning member was 2.31 per household on beneficiary against 2.26 in case of non-beneficiary per household. The males were dominating earning members in both cases. It is also noticed that OBC and SC were main dominating castes in both cases. There was no ST householq in non-beneficiary households in none of selected districts. All of beneficiary as well as non-beneficiary households had ration card. Among the beneficiary households, 34 per cent was BPL card holders and 47 per cent APL card holders. In case of non beneficiary households, 54 per cent had APL cards 24 per cent had AAA cards and remaining 22 per cent had BPL cards. The main occupation was non agricultural operations followed by agricultural operations in both cases. Out of total man days, per household worked under NREGA, accounted for 15.51% in case of beneficiary households.

Non-agricultural labour had highest percentage of man days employment in both households. The non-farm sector had contributed around 64.82 per cent of total employment man days generated in both cases.

The overall average annual net income was worked out at Rs. 46,851 in case of beneficiary while it was estimated at Rs. 54,595 in case of non beneficiary. Which was higher by 16.53 per cent over the annual income of beneficiary household. Out of total average annual net income, the NREGA accounted for 13.08 per cent. The non-farm activities were main sources of income of both cases.

The consumption pattern of households indicates the level of their food security. The per capita per month consumption of total cereals was a little bit higher on beneficiary households than that of non beneficiary households. While it was just reverse in case of pulses. The per capita per month consumption of vegetables was around two times higher in case of beneficiary households than that of non-beneficiary households. While it was reverse in case of fruits. There was a low difference in consumption of egg, fish meat, sugar, spices between beneficiary and non- beneficiary households.

The consumption of milk and milk products showed a wide difference across the households. The variability in food expenditure was higher in case of beneficiary households compared to non-beneficiary households. The total monthly per capita expenditure of beneficiary household was higher by 1.11 times than that of non-beneficiary households. This indicates that due to NREGA scheme, the earning of the beneficiaries have been significantly increased and on account of this, the CV of consumption expenditure on both categories of food and non food items in majority of cases was seen to be higher for beneficiary households. This was due to earning from NREGA. The average annual household income of beneficiary was Rs. 46,852 against Rs. 54,595 of non-beneficiaries while average annual expenditure on consumption per household was Rs. 24,654 as compared to Rs. 25471 on non beneficiary household. Thus, it reflects that income and expenditure on consumption were higher by 1.17 and 1.03 times on non beneficiary household than that of beneficiary households. At the aggregate level in both cases the annual income of respondents was higher by 1.17 and 1.03 times on beneficiary households than that of non-beneficiary household. At aggregate level in both cases the annual income of respondent was higher than the average annual consumption of the respondents. The household income other than NREGA for beneficiaries at the household level was negatively related to participation in NREGA while household size and SC and ST households were positively related with NREGA participant. The per capita consumption of pulses of beneficiary and non-beneficiary was higher than NSS data while it was reverse in case of rice. The per capita per month consumption total

cereals of beneficiary and non-beneficiary households was similar to NSS data.

TABLE 3—HOUSEHOLD CONSUMPTION OF FOOD ITEMS (Kg. PER CAPITA PER MONTH)

Food items	Beneficiaries	Non-beneficiaries	Aggregate	NSS (1993-94)	NSS (1999-00)	NSS (2004-05)
Rice	5.78	4.98	5.62	6.79	6.59	6.38
Wheat	7.53	6.87	7.39	4.32	4.48	4.19
Other cereals	0.29	0.07	0.25	2.29	1.65	1.55
Total cereals	13.60	11.92	13.27	13.40	12.72	12.12
Total pulses	1.32	1.14	1.29	0.76	0.84	0.71
Sugar etc.	0.64	0.62	0.63			0.871
Edible oils	0.66	0.52	0.63			0.472
Liquid milk	1.56	1.63	1.57	3.94	379	3.87
Milk products	0.29	0.04	0.24			NA
Spices in gram	64.48	54.71	62.53		.	45.100
Egg, fish, meat etc.	0.07	0.08	0.07	0.06	0.07	0.05
Fruits	0.35	1.80	0.64		.	
Vegetables	6.82	3.90	6.24			
Confectionery	NA	NA	NA	NA	NA	NA

Work Profile under NREGA Wage Structure and Migration Issue

The work profile of beneficiary households under NREGA reveals that an average 1.42 persons under household were employed under different activities of NREGA across the state. Within social categories, SC and ST beneficiaries were highest and had 1.49 and 1.50 persons per household employed by NREGA respectively. The general categories with 1.14 persons per household employed in NREGA was on lowest place. The participation at the aggregate level was 0.97 of male and 0.45 female per household across the selected districts during reference year. The study also reveals that at aggregate level, per household man days employed under NREGA was 61.63 against 100 man days. The participation women beneficiary per household was 0.45 against 0.97 men beneficiary per household. The maximum number of person days was worked out (67.50) per household in case of ST followed by SC category (63.37) person days per household. There was no variation in wage rate under NREGA activities across the gender in U.P. The wage rate was Rs. 100 per day for men as well as women under NREGA. Few beneficiaries had reported that there was unfair means practice had been adopted by Gram Panchayat in the payment of wages. The different activities like road connectivity, water conservation and harvesting, renovation of traditional water bodies etc. had been taken up under NREGA in U.P.

The study also reveals that majority of beneficiary households were engaged under road connectivity, flood control minor irrigation water conservation and harvesting works. This pattern was more or less similar across the states. A majority of households i.e. 57 per cent reported that quality of assets generated under NREGA was good. However, unemployment allowance was not received by any sample households. The wage rate under NREGA was higher than wage rate of agricultural and non agricultural labour in most of the districts of the state. There was no variation in wages received by NREGA workers and it was Rs. 100 per day for both groups men and women across the state.

Qualitative Aspects of NREGA Functioning

The analysis reveals that values of assets owned by a non beneficiary household was Rs. 2,51,702 against Rs. 2,88,219 per beneficiary household. It shows that assets position of non beneficiary was sound and better. Among the assets value of land, house and live stock was quite higher than other assets on beneficiary and non-beneficiary households in the study areas of U.P.

It is also evident from the analysis of the study that the main source of borrowing was banks in both cases. The per household per annum of borrowing amount was Rs. 3050 in case of non beneficiary against Rs. 3585 in case of beneficiary household. The purposes of borrowing, of loan from banks were to purchase of land, live stock etc. Apart from these, loans were also taken to meet out daily consumption need, social ceremony, construction of house etc. The Self Help Group (SHGs) were also source of institution to borrow the loan for other purposes. It is

witnessed that the strength of borrowing households was higher who had accounts in the banks.

Quantitative Aspects Related to Food Security

Majority of respondents had not sufficient food grains to meet the consumption need of their family members throughout the year. The unemployment, inadequacy of work during the off season of agriculture were major problems of selected households. Most of the selected households had not sufficient physical and financial assets as per their requirement. The study also reveals that 12 per cent respondents were in view that amelioration of poverty would be possible to proper payment of wages, increase of work of NREGA and provision of food during the work. As far as response regarding the suggestion to improve the efficiency of NREGA, the 55 per cent of selected respondents was of the view that the increase of work, enhance the wage (40%) suitable timing of NREGA etc. (11.00) would be fruitful to attract more work forces.

Impact of NREGA on Village Economy

The infrastructural facilities of selected villages are more or less developed. The road connectivity, land line or mobile phone, agricultural produce, markets, primary. school, gram panchayat office, Self Help Groups centre etc were hundred per cent available in the selected villages. The financial institutions and availability of primary hospitals were quite inadequate in members in the selected villages.

TABLE-4—INFRASTRUCTURE AVAILABLE WITHIN THE VILLAGE

(% of villages)

Particular	Within village	Nearest village	Distant village or far off places	If nearest village, average distance(Kms)
Road connectivity	100	-	-	-
Railway connectivity	20	-	-	11.5
Landline or mobile connectivity	100	-	-	-
Post Office	30	-	-	3.6
Co-operative credit society	30	-	-	4.2
Regional Rural Bank	20	-	-	7.8
Commercial Bank	10	-	-	9.4
Agricultural Produce Market	100	-	-	-
Self Help group Centre	100	-	-	-
School Primary	100	-	-	-
School Secondary	60	-	-	2.1
School Higher Secondary	30	-	-	5.3
Primary Health Centre	20	-	-	6.5
Hospital/ Dispensary	10	-	-	13.6
Gram Panchayat Office	100	-	-	-
Fair Price Shop	50	-	-	2.5
Any Other	-	-	-	-

The impact of NREGA on occupational structure was slightly visible on the beneficiary households of the selected villages. There was slight increase in the small-scale industries followed by trade and business activities in the households. The impact of NREGA on wage rate for different activities of agricultural and non-agricultural was quite impressive. The wage rate per day for work of agricultural operations was Rs. 37.50 and Rs. 29.00 in 2005, which has increased to Rs. 60 and Rs. 40 in 2009 for men and women respectively. The wage rate for non-agricultural activities has significantly increased in rural areas due to NREGA. After the implementation of NREGA, the agricultural labourers had shifted from agricultural works to non-agricultural works. This was causing the shortage of agricultural labours. The labour shortage in agriculture was estimated at about 70 per cent in the selected villages of the selected district due to implementation of NREGA.

On the account of increase in wage rate due to NREGA the cost of production of crops has increased by 20 to 40 per cent. The migration of labourers has also stopped about 70 per cent after implementation of NREGA.

The laboururs generally do not go outside from their villages to seek works since the implementation of NREGA. After implementation of NREGA, children of poor households are now going to school. The impact of NREGA on the socio-economic conditions of rural households was quite significant. As a result of this, the shape of villages and condition of target groups has changed from worst to better. This is landmark programme of Govt. of India to improve the socio-economic conditions of target groups of the village society. It only needs to proper implementation of NREGA activities at grass root level without adopting any foul means.

Policy Implications

The NREGA is one of the best programmes of Govt. of India to improve the quality of life of dispersed classes of the society of villages of Uttar Pradesh. The impact of NREGA is very positive from every comer for the improvement of socio-economic conditions of target groups of the society. The infrastructural facilities have improved in remote villages. The wage rate which was quite low in the villages has significantly improved. Migration of unskilled laboururs is more or less stopped. The income of households has considerably increased. The irrigation facilities have improved. These improvements have been attributed by NREGA. Even then, there are still some scope for improvement in policy of NREGA in the context U.P. which are suggested as follows.

1. There is more need to strengthen Gram Panchayat bodies to proper execution of works under NREGA.
2. There should be full transparence in issuing the job cards.
3. Payment of wage should be made through banks at any cost to root-out the corruption in the payment of wages. .
4. The payment of wage to laboururs should be made after proper monitoring of their allotted works.
5. The monitoring cell of NREGA should be more vigilant to make more transference in the different activities of NREGA.
6. The foul payment and wrong entry in job cards should be strictly prohibited to make the responsible to Gram Panchayat etc.
7. The payment for materials and wages should be done by single agency to avoid the delay of works.
8. Since majority of workers of NREGA are illiterate, therefore, banks should cooperate at the time of withdrawal of amount from their accounts. Sincere efforts should be made to reduce the delay in the payment of wages. The participation of female workers in the activities of NREGA is very less across the state, hence, the awareness should be propagated among the female workers to take more part in the activities of NREGA to increase their family income.
9. The activities of NREGA should be taken up in slack season of agriculture to avoid the shortage of labours in the agricultural operations.
10. The job cards should be available to each and every household who is willing to do the work under NREGA.
11. The technical staff should chalk-out the plan of NREGA in an advance to timely start of NREGA activities in villages. This would be also helpful in improving the quality of work. The priority of work should be fixed according to demand of villages. The wage rate of labourers has tremendously increased accordingly in the villages due to NREGA. On account of this, the cost of production of crops has also increased simultaneously. Therefore, the prices of commodities should also be increased to safeguard the interest of farmers.
12. The plantation of tress should also get proper attention in the activities of NREGA.
13. The job card holders should get life insurance coverage because some of the activities of NREGA are risky.

D. Commodity Reviews

(i) Foodgrains

During the month of July 2012 the Wholesale Prices of foodgrains displayed a rising trend. Wholesale Price Index (Base 2004-05=100) of foodgrains, pulses and Cereals rose by 3.46 per cent, 8.10 per cent and 2.31 per cent respectively over the previous month.

ALL INDIA INDEX NUMBER OF WHOLESALE PRICES

(Base : 2004-2005=100)

Commodity	Weight (%)	WPI for the Month of July 2012	WPI for the Month of June 2012	WPI A year ago	Percentage change during a	
					month	year
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Rice	1.793	187.1	181.6	169.9	3.03	10.12
Wheat	1.116	182.2	180.2	170.8	1.11	6.67
Jowar	0.096	231.0	235.2	261.3	–1.79	–11.60
Bajra	0.115	223.7	209.4	193.3	6.83	15.73
Maize	0.217	224.3	220.3	205.7	1.82	9.04
Barley	0.017	202.4	200.1	181.7	1.15	11.39
Ragi	0.019	235.6	224.0	197.3	5.18	19.41
Cereals	3.373	190.7	186.4	176.1	2.31	8.29
Pulses	0.717	244.2	225.9	190.4	8.10	28.26
Foodgrains	4.09	200.1	193.4	178.6	3.46	12.04

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 July, 2012.

Commodity	Main Trend	Rising	Falling	Mixed	Steady
Rice	Rising	Jharkhand Gujarat Tamil Nadu Uttar Pradesh West Bengal Kerala Karnataka Haryana			Assam
Wheat	Rising	Karnataka Gujarat Rajasthan Uttar Pradesh	 Jharkhand 	 Haryana MP	
Jowar	Rising	A.P. Maharashtra Rajasthan	Karnataka Tamil Nadu	 Gujarat	U.P
Bajra	Rising	AP Karnataka Gujarat Rajasthan	Haryana Tamil Nadu		U.P.
Maize	Rising	U.P Karnataka A.P. Gujarat Rajasthan	 Jharkhand	Haryana	M.P.

Procurement of Rice

426 thousand tonnes of Rice (including paddy converted into rice) was procured during July 2012, as against 1860 thousand tonnes of Rice (including paddy converted into rice) procured during July 2011.The total procurement of Rice in the current marketing season i.e 2011-2012, upto 31.07.2012 stood at 34673 thousand tonnes, as against 32501 thousand 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 2011-12 (up to 31-07-12)		Corresponding Period of last Year (2010-11)		Marketing Year (October-September) 2010-11		2009-10	
	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	7446	21.47	8883	27.33	9610	28.10	7555	23.58
Chhatisgarh	4115	11.87	3644	11.21	3746	10.95	3357	10.48
Haryana	1985	5.72	1687	5.19	1687	4.93	1819	5.68
Maharashtra	158	0.46	205	0.63	308	0.90	229	0.71
Punjab	7731	22.30	8635	26.57	8635	25.25	9275	28.95
Tamil Nadu	1596	4.60	1408	4.33	1543	4.51	1241	3.87
Uttar Pradesh	3350	9.66	2395	7.37	2554	7.47	2901	9.06
Uttarakhand	378	1.09	399	1.23	422	1.23	375	1.17
Others	7914	22.82	5245	16.14	5693	16.65	5282	16.49
Total	**34673**	**100.00**	**32501**	**100.00**	**34198**	**100.00**	**32034**	**100.00**

Source: Department of Food and Public Distribution.

Procurement of Wheat

The total procurement of wheat in the current marketing season i.c. 2012-2013 upto July, 2012 is 38148 thousand tonnes against a total of 28147 thousand tonnes of wheat procured during last year. The details are given in the following table :

PROCUREMENT OF WHEAT

(in thousand tonnes)

State	Marketing Season 2012-13 (up to 31-07-2012)		Corresponding Period of last Year (2011-12)		Marketing Year (April-March) 2011-12		2010-11	
	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	8665	22.71	6882	24.45	6928	24.45	6347	28.19
Madhya Pradesh	8493	22.26	4905	17.43	4965	17.52	3539	15.72
Punjab	12834	33.64	10957	38.93	10958	38.67	10209	45.35
Rajasthan	1964	5.15	1303	4.63	1303	4.60	476	2.11
Uttar Pradesh	5063	13.27	3461	12.30	3461	12.21	1645	7.31
Others	1129	2.96	639	2.27	720	2.54	298	1.32
Total	**38148**	**100.00**	**28147**	**100.00**	**28335**	**100.00**	**22514**	**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 196.0 in July, 2012 showing a rise of 6.5 per cent and 25.5 per cent over the previous month and over the previous year, respectively.

The Wholesale Price Index (WPI) of all individual oilseeds showed a mixed trend. The WPI of Groundnut seed (1.2 per cent), Niger Seed (1.1 per cent) and Sunflower (1.5 per cent), decreased over the previous month. However, the WPI Soyabean (17.6 per cent), Gingelly seed (12.8 per cent), Cottonseed (7.7 per cent), Rape & Mustard (4.2 per cent), Copra (1.8 per cent) and Safflower seed (0.2 per cent) increased over the previous month. The Wholesale Price Index (WPI) of Edible Oils as a group stood 148.2 in July, 2012 showing a rise of 1.4 per cent and 10.8 per cent over the previous month and over the previous year, respectively. The WPI of Groundnut Oil (0.8 per cent), Mustard Oil (2.2 per cent), Cottonseed Oil (1.3 per cent), Sunflower Oil (2.5 per cent), Soyabean Oil (4.3 per cent) and Gingelly Oil (4.9 per cent) increased compared to the previous month. However, the WPI of Copra oil (1.0 per cent) decreased over the previous month.

FRUITS AND VEGETABLE :

The Wholesale Price Index (WPI) of Fruits & Vegetable as a group stood at 211.3 in July, 2012 showing a fall of 0.7 per cent over the previous month. However, it increased by 10.5 per cent over the previous year.

POTATO :

The Wholesale Price Index (WPI) of Potato stood at 247.9 in July, 2012 showing a rise of 6.5 per cent and 73.2 per cent over the previous month and over the previous year, respectively.

ONION :

The Wholesale Price Index (WPI) of Onion stood 180.7 in July, 2012 showing an increase of 14.4 per cent over the previous month. However, it decreased by 10.1 per cent over the previous year.

CONDIMENTS AND SPICES:

The Wholesale Price Index (WPI) of Condiments and Spices (Group) stood at 204.0 in July, 2012 showing an increase of 3.9 per cent over the previous month. However, it decreased by 13.7 per cent over the previous year.

The Wholesale Price Index of Black Pepper, Chillies (Dry) and Turmeric increased by 6.4 per cent, 2.1 per cent and 11.4 per cent, respectively over the previous month.

RAW COTTON:

The Wholesale Price Index (WPI) of Raw Cotton stood at 216.8 in July, 2012 showing an increase of 9.1 per cent and 4.7 per cent over the previous month and over the previous year respectively.

RAW JUTE:

The Wholesale Price Index (WPI) of Raw Jute stood at 246.3 in July, 2012 showing an increase of 8.5 per cent and 10.6 per cent over the previous month and over the previous year respectively

WHOLESALE PRICE INDEX OF COMMERCIAL CROPS FOR THE MONTH OF JULY, 2012

(Base Year : 2004-05=100)

Commodity	Latest	Month	Year	Percentage Variation over a	
	July, 2012	June, 2012	July, 2011	Month	Year
Oil Seeds	196.0	184.1	156.2	6.5	25.5
Groundnut Seed	229.9	232.7	194.4	-1.2	18.3
Rape & Mustard Seed	187.0	179.4	143.6	4.2	30.2
Cotton Seed	157.5	146.3	142.7	7.7	10.4
Copra (Coconut)	91.9	90.3	116.5	1.8	-21.1
Gingelly Seed (Sesamum)	276.6	245.3	187.0	12.8	47.9
Niger Seed	201.2	203.4	176.0	-1.1	14.3
Safflower (Kardi Seed)	150.4	150.1	146.9	0.2	2.4
Sunflower	175.8	178.4	169.4	-1.5	3.8
Soyabean	244.8	208.1	136.7	17.6	79.1
Edible Oils	148.2	146.1	133.7	1.4	10.8
Groundnut Oil	192.1	190.6	162.8	0.8	18.0
Cotton Seed Oil	173.0	170.7	149.8	1.3	15.5
Mustard & Rapeseed Oil	154.6	151.2	129.2	2.2	19.7
Soyabean Oil	163.7	157.0	146.4	4.3	11.8
Copra Oil	114.2	115.4	118.4	-1.0	-3.5
Sunflower Oil	138.3	134.9	131.0	2.5	5.6
Gingelly Oil	159.7	152.2	143.2	4.9	11.5
Fruits and Vegetables	211.3	212.7	191.2	-0.7	10.5
Potato	247.9	232.8	143.1	6.5	73.2
Onion	180.7	157.9	200.9	14.4	-10.1
Condiments and Spices	204.0	196.3	236.4	3.9	-13.7
Black Pepper	530.0	497.9	354.6	6.4	49.5
Chillies(Dry)	224.7	220.1	276.2	2.1	-18.6
Turmeric	156.9	140.9	248.4	11.4	-36.8
Raw Cotton	216.8	198.8	207.1	9.1	4.7
Raw Jute	246.3	227.1	222.7	8.5	10.6

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	Woman	Non Adult	Man	Woman	Non Adult	Man	Woman	Non Adult	Carpenter	Blacksmith	Cobbler
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Andhra Pradesh															
Krishna	Ghantasala	Dec., 2011	8	250.00	100.00	NA	250.00	130.00	NA	NA	NA	NA	NA	NA	NA
Guntur	Tadikonda	Dec., 2011	8	200.00	175.00	110.00	200.00	160.00	110.00	160.00	NA	NA	NA	NA	NA
Rangareddy	Arutla	Dec., 2011	8	200.00	120.00	NA	150.00	120.00	NA	150.00	120.00	NA	220.00	200.00	NA
Karnataka															
Bangalore	Harisandra	July to Sep., 2011	8	200.00	150.00	NA	200.00	150.00	NA	250.00	180.00	NA	300.00	300.00	NA
Tumkur	Gedlahali	July to Sep., 2011	8	150.00	150.00	NA	140.00	145.00	NA	150.00	NA	NA	150.00	150.00	NA
Maharashtra															
Nagpur	Mauda	Dec., 2009	8	100.00	80.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ahmednagar	Akole	June, 2009	8	80.00	70.00	NA	NA	NA	NA	NA	NA	NA	83.5	85.00	85.00
Jharkhand															
Ranchi	Gaintalsood	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		
											Carpenter	Blacksmith	Cobbler
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Assam													
Barpeta	Loharapara	March,12	M	8	180.00	180.00	180.00	180.00	180.00	180.00	180.00	180.00	180.00
			W	8	NA	NA	160.00	160.00	160.00	NA	NA	NA	NA
Bihar													
Muzaffarpur	Bhalui Rasul	Feb. &,	M	8	104.00	104.00	104.00	104.00	104.00	NA	150.00	150.00	150.00
		March, 2010	W	8	NA	104.00	104.00	104.00	104.00	NA	NA	NA	NA
Shekhpura	Kutaut	May &	M	8	150.00	NA	NA	NA	150.00	NA	220.00	NA	NA
		June, 2010	W	8	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chhattisgarh													
Dhamtari	Sihaba	May, 2012	M	8	NA	NA	NA	80.00	80.00	80.00	150.00	80.00	70.00
			W	8	NA	NA	NA	60.00	60.00	100	80.00	80.00	NA
Gujarat													
Rajkot	Rajkot	Nov., 2011	M	8	179.00	200.00	138.00	156.00	125.00	125.00	275.00	275.00	245.00
			W	8	NA	137.00	133.00	134.00	125.00	87.00	NA	NA	NA
Dahod	Dahod	Nov, 2011	M	8	71.00	71.00	71.00	71.00	71.00	NA	143.00	150.00	150.00
			W	8	NA	71.00	71.00	71.00	71.00	NA	NA	NA	NA
Haryana													
Panipat	Ugarakheri	March &	M	8	180.00	180.00	180.00	200.00	180.00	NA	NA	NA	NA
		April, 2012	W	8	NA	150.00	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 Working Hours	Ploughing	Sowing	Weeding	Harvesting	Other Agri. Labour	Herdsman	Skilled Labour		
											Carpenter	Blacksmith	Cobbler
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Himachal Pradesh													
Mandi	Mandi	Nov., to Dec. 2010	M	8	300.00	110.00	110.00	110.00	110.00	110.00	200.00	200.00	NA
			W	8	NA	110.00	110.00	110.00	110.00	110.00	NA	NA	NA
Kerala													
Kozhikode	Koduvally	Nov., 2011	M	4 to 8	670.00	450.00	NA	450.00	560.00	NA	500.00	NA	NA
			W	4 to 8	NA	NA	350.00	350.00	400.00	NA	NA	NA	NA
Palakkad	Elappally	Nov., 2011	M	4 to 8	400.00	300.00	NA	275.00	356.3	NA	400.00	NA	NA
			W	4 to 8	NA	NA	150.00	200.00	155.00	NA	NA	NA	NA
Madhya Pradesh													
Hoshangabad	Sangarkhera	July, 2012	M	8	150.00	130.00	150.00	150.00	125.00	100.00	350.00	350.00	NA
			W	8	NA	130.00	150.00	150.00	125.00	100.00	NA	NA	NA
Satna	Kotar	July, 2012	M	8	NA	NA	NA	NA	NA	NA	NA	NA	NA
			W	8	NA	NA	NA	NA	NA	NA	NA	NA	NA
Shyopur Kala	Vijaypur	July, 2012	M	8	NA	NA	NA	NA	NA	NA	NA	NA	NA
			W	8	NA	NA	NA	NA	NA	NA	NA	NA	NA
Orissa													
Bhadrak	Chandbali	March, 2012	M	8	NA	NA	NA	150.00	170.00	50.00	250.00	NA	NA
			W	8	NA	NA	NA	NA	103.33	40.00	NA	NA	NA
Ganjam	Aska	March, 2012	M	8	200.00	150.00	150.00	150.00	175.00	150.00	300.00	150.00	150.00
			W	8	NA	80.00	80.00	80.00	80.00	80.00	NA	NA	NA
Punjab													
Ludhiana	Pakhowal	June, 2008	M	8	NA	NA	90.00	95.00	NA	99.44	NA	NA	NA
			W	8	NA	NA	NA	NA	NA	NA	NA	NA	NA
Rajasthan													
Barmer	Vishala	Aug., 2011	M	8					—NA—				
			W	8					—NA—				
Jalore	Panwa	Aug., 2011	M	8	NA	NA	NA	NA	NA	50.00	100.00	150.00	NA
			W	8	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tamil Nadu													
Thanjavur	Pulvarnatham	March, 2012	M	6					—NR—				
			M	5									
Tirunelveli	Malayakulam (Kurvikulam)	March, 2012	M	8	NA	NA	NA	NA	NA	NA	NA	NA	NA
			W	8	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tripura													
Agartala	Govt. Agri. Farm								—NA—				
Uttar Pradesh													
Meerut	Ganeshpur	May, 2012	M	8	203.00	202.00	196.00	204.00	197.00	NA	302.00	NA	NA
			W	8	NA	172.00	168.00	177.00	169.00	NA	NA	NA	NA
Chandbali	Dhanpur	May, 2012							—NR—				
Chandauli	Chandauli	May, 2012	M	8	NA	NA	NA	125.00	125.00	NA	236	NA	NA
			W	8	NA	NA	NA	125.00	125.00	NA	NA	NA	NA

M-Man, W-Woman,

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

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	July-12	Jun.-12	July-11
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Wheat	PBW 343	Quintal	Punjab	Amritsar	1250	NA	1175
Wheat	Dara	Quintal	Uttar Pradesh	Chandausi	1210	1230	NA
Wheat	—	Quintal	Madhya Pradesh	Sagar	1500	1500	1450
Jowar	—	Quintal	Maharashtra	Mumbai	2100	2350	2750
Gram	—	Quintal	Punjab	Abohar	NA	NA	NA
Maize	Yellow	Quintal	Uttar Pradesh	Bahraich	1050	1030	1020
Gram Split	—	Quintal	Maharashtra	Mumbai	5000	4350	3725
Gram Split	—	Quintal	Bihar	Patna	5000	4930	3270
Arhar Split	—	Quintal	NCT of Delhi	Delhi	7000	6200	5600
Arhar Split	—	Quintal	Maharashtra	Mumbai	5200	5200	6000
Arhar Split	Sort II	Quintal	Tamil Nadu	Chennai	6700	6700	4900
Arhar Split	—	Quintal	Bihar	Patna	5700	6000	6075
Gur	Balti	Quintal	Uttar Pradesh	Hapur	3070	3050	NA
Gur	Sort II	Quintal	Tamil Nadu	Chennai	2900	2900	2600
Gur	—	Quintal	Maharashtra	Mumbai	3240	3250	3000
Mustard Seed	Rai UP	Quintal	West Bengal	Kolkata	4250	4000	3050
Mustard Seed	Raira	Quintal	West Bengal	Kolkata	NA	NA	NA
Mustard Seed	Black (S)	Quintal	Uttar Pradesh	Kanpur	3725	3450	2660
Linseed	—	Quintal	Maharashtra	Nagpur	4000	4000	3100
Linseed	Bada Dana	Quintal	Uttar Pradesh	Kanpur	3525	3200	2725
Cotton Seed	Superior	Quintal	Maharashtra	Jalgaon	NA	NA	NA
Castor Seed	—	Quintal	Andhra Pradesh	Badepalli	NA	NA	NA
Sesamum Seed	Black	Quintal	Tamil Nadu	Chennai	4500	4500	4500
Cotton Seed	—	Quintal	Maharashtra	Mumbai	NA	NA	NA
Copra	FAQ	Quintal	Kerala	Alleppey	4125	4250	6050
Groundnut	—	Quintal	Maharashtra	Mumbai	6450	6250	6460
Groundnut	TMV 7	Quintal	Tamil Nadu	Chennai	4280	4280	4280
Mustard Oil	Ordinary	15 Kg.	West Bengal	Kolkata	1440	1365	1130
Mustard Oil	—	15 Kg.	Uttar Pradesh	Kanpur	1313	1256	998
Groundnut Oil	—	15 Kg.	Maharashtra	Mumbai	1785	1800	1448
Groundnut Oil	Ordinary	15 Kg.	Tamil Nadu	Chennai	1800	1725	1470
Linseed Oil	—	15 Kg.	Uttar Pradesh	Kanpur	1440	1406	971
Castor Oil	—	15 Kg.	Uttar Pradesh	Kanpur	NA	NA	NA
Sesamum Oil	Agmark	15 Kg.	Tamil Nadu	Chennai	2175	1950	1845
Sesamum Oil	—	15 Kg.	Maharashtra	Mumbai	NA	NA	NA
Coconut Oil	—	15 Kg.	Kerala	Cochin	930	953	1455
Mustard Cake	—	Quintal	Uttar Pradesh	Kanpur	1765	1670	1090
Groundnut Cake	—	Quintal	Uttar Pradesh	Kanpur	NA	NA	NA
Cotton/Kapas	F414	Quintal	Punjab	Abohar	NA	NA	NA
Cotton/Kapas	LRA	Quintal	Tamil Nadu	Thiruppur	NA	NA	NA
Wool	Fine	Quintal	Madhya Pradesh	Dabra	NA	NA	NA
Jute Raw	TD5	Quintal	West Bengal	Kolkata	2685	2600	2525

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	July.-12	June-12	July-11
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Jute Raw	W5	Quintal	West Bengal	Kolkata	2660	2575	2425
Oranges	—	100 No.	Maharashtra	Mumbai	NA	NA	NA
Oranges	Nagpuri	100 No.	West Bengal	Kolkata	NA	NA	NA
Oranges	Big	100 No.	Tamil Nadu	Chennai	550	550	640
Banana	Basarai	100 No.	Maharashtra	Jalgaon	450	350	670
Banana	Singapore	100 No.	West Bengal	Kolkata	375	350	NA
Cashewnuts	—	Quintal	Maharashtra	Mumbai	50000	45000	56500
Almonds	—	Quintal	Maharashtra	Mumbai	45000	43500	36000
Walnuts	—	Quintal	Maharashtra	Mumbai	53000	53000	65000
Kishmish	—	Quintal	Maharashtra	Mumbai	12800	12500	12583
Peas Green	—	Quintal	Tamil Nadu	Chennai	NA	11000	NA
Tomatoes	—	Quintal	Tamil Nadu	Chennai	2000	2000	800
Ladyfinger	—	Quintal	Tamil Nadu	Chennai	2700	2700	1400
Cauliflower	—	100 No.	Tamil Nadu	Chennai	1100	1500	800
Potatoes	Red	Quintal	Bihar	Patna	1180	1080	925
Potatoes	Desi	Quintal	West Bengal	Kolkata	1140	1340	640
Potatoes	Sort I	Quintal	Tamil Nadu	Mettuppalayam	NA	2624	1674
Onions	Bombay	Quintal	West Bengal	Kolkata	NA	NA	NA
Turmeric	Erode	Quintal	West Bengal	Kolkata	5600	5500	NA
Turmeric	Nadan	Quintal	Kerala	Cochin	7800	7500	12000
Chillies	—	Quintal	Bihar	Patna	7400	7700	8300
Black Pepper	Palai	Quintal	Kerala	Alleppey	NT	NT	26000
Ginger	Dry	Quintal	Kerala	Cochin	10800	9000	13000
Cardamom	Big	Quintal	West Bengal	Kolkata	80000	80000	110000
Cardamom	Small	Quintal	West Bengal	Kolkata	110000	110000	90000
Milk	Cow	100	NCT of Delhi	Delhi	3600	3400	3300
Milk	Buffalo	100	West Bengal	Kolkata	3400	3200	3000
Ghee Deshi	Agmark	Quintal	West Bengal	Kolkata	33000	33000	NA
Ghee Deshi	—	Quintal	Uttar Pradesh	Khurja	NA	NA	NA
Ghee Deshi	—	Quintal	Maharashtra	Mumbai	25500	25800	23500
Fish	Rohu	Quintal	West Bengal	Kolkata	17000	16000	NA
Fish	Sea Prawns	Quintal	Tamil Nadu	Chennai	18000	20000	16000
Eggs	Madras	1000 No.	West Bengal	Kolkata	3400	3200	2800
Tea	Medium	Quintal	Assam	Guwahati	NA	NA	14000
Tea	Atti Kunna	Quintal	Tamil Nadu	Coimbatore	NA	NA	14000
Coffee	Plant-A	Quintal	Tamil Nadu	Coimbatore	26000	26000	25000
Coffee	Rubusta	Quintal	Tamil Nadu	Coimbatore	14000	14000	12000
Tobacco	Kampila	Quintal	Uttar Pradesh	Farukhabad	2230	2210	2215
Tobacco	Raisa	Quintal	Uttar Pradesh	Farukhabad	2125	2100	2100
Tobacco	Bidi /Tobacco	Quintal	West Bengal	Kolkata	4000	4500	3200
Rubber	—	Quintal	Kerala	Kottayam	17000	17500	19700
Arecanut	Rashi	Quintal	Tamil Nadu	Chennai	30000	30000	26000

NA :—Not Available

NT :—Not Transaction

3. Month-end Wholesale Prices of Some Important Agricultural Commodities in International Markets During Year, 2012

Commodity	Variety	Country	Centre	Unit	Jan.	Feb.	Mar.	Apr.	May	June	Jul
Barley		Canada	Winni-peg	Dollar/M.T.	213.00	214.00	216.00	220.00	220.00	220.00	220.00
				Rs./Qtl.	1072.88	1048.81	1100.30	1175.68	1183.38	1203.40	1202.4
Cardamom	Guatmala Bold Green	U.K.	—	Dollar/M.T.	15000.00	1100.00	1250.00	1250.00	200.00	1250.00	12500.00
				Rs./Qtl.		85536.00					
Cashew Kernels	Spot U.K. 320s	U.K.	—	Dollar/1bs	4.12	4.03	4.00	4.06	4.03	3.80	3.68
				Rs./Qtl.	71672.23	69067.37	71815.14	76034.38	77034.63	73199.25	70092.84
Castor Oil	Any Origin ex tank Rotterdam	Nether-lands	—	Dollar/M.T.	1880.00	1875.00	1700.00	1600.00	1500.00	1500.00	1640.00
				Rs./Qtl.	9687.64	9185.63	8649.60	8392.00	8305.50	8346.00	9074.12
Celery Seed	ASTA cif	India	—	Dollar/M.T.	1500.00	1500.00	1500.00	1500.00	1500.00	1500.00	1500.00
				Rs./Qtl.	7729.50	7348.50	7632.00	7867.50	8305.50	8346.00	8299.50
Chillies	Birds eye 2005 crop	Africa	—	Dollar/M.T.	5500.00	6500.00	5900.00	5900.00	5650.00	5650.00	5650.00
				Rs./Qtl.	28341.50	31843.50	30019.20	30945.50	31284.05	31436.60	31261.45
Cinnamon Bark		Mada-gascar	—	Dollar/M.T.	1100.00	1100.00	1100.00	1100.00	1100.00	1100.00	1100.00
				Rs./Qtl.	5668.30	5388.90	5596.80	5769.50	6090.70	6120.40	6086.30
Cloves	Singapore	Mada-gascar	—	Dollar/M.T.	10875.00	12000.00	12000.00	12000.00	12000.00	10300.00	10300.00
				Rs./Qtl.	56038.88	58788.00	61056.00	62940.00	66444.00	57309.20	56989.90
Coconut Oil	Crude Phillipine/ Indonesia	Nether-lands	—	Dollar/M.T.	1430.00	1430.00	1315.00	1325.00	1030.00	1095.00	1055.00
				Rs./Qtl.	7368.79	7005.57	6690.72	6949.63	5703.11	6092.58	5837.32
Copra	Phillipines cif Rotterdam	Philli pine	—	Dollar/M.T.	901.50	905.00	835.00	825.50	648.00	692.00	663.50
				Rs./Qtl.	4645.43	4433.60	4248.48	4329.75	3587.98	3850.29	3671.15
Corriander		India	—	Dollar/M.T.	1150.00	1150.00	1150.00	1150.00	1150.00	1150.00	1150.00
				Rs./Qtl.	5925.95	5633.85	5851.20	6031.75	6367.55	6398.60	6362.95
Cummin Seed		India	—	Dollar.M.T.	3800.00	3800.00	3800.00	3800.00	3800.00	2800.00	2800.00
				Rs./Qtl.	19581.40	18616.20	19334.40	19931.00	21040.60	15579.20	15492.40
Fennel seed		India	—	Dollar/M.T.	2600.00	2600.00	2600.00	2600.00	2600.00	2600.00	2600.00
				Rs./Qtl.	13397.80	12737.40	13228.80	13637.0	14396.20	14466.40	14385.80
Ginger	Split	Nigeria	—	Dollar/M.T.	3800.00	3400.00	2550.00	2550.00	2550.00	2550.00	2550.00
				Rs./Qtl.	19581.40	16656.60	12974.40	13374.75	14119.35	14188.20	14109.15
Groundnut kernels	US 2005, 40/50 cif Rotterdam	European Ports	—	Dollar/M.T	-	-	-	2400.00	1725.00	1650.00	1595.00
				Rs./Qtl.	-	-	-	12588.00	9551.33	9180.60	8825.14
Groundnut Oil	Crude Any Origin cif Rotterdam	U.K.	—	Dollar/M.T	-	2200.00	2200.00	2200.00	2200.00	2200.00	2200.00
				Rs./Qtl.	-	17107.20	17921.20	18770.40	19080.60	19228.00	19012.40
Lentils	Turkish Red Split Crop 1+1 water	U.K.	—	Pound/M.T	587.57	567.02	562.08	553.32	574.59	572.94	576.16
				Rs./Qtl.	4637.69	4409.15	4578.70	4720.93	4983.42	5007.50	4979.17
Maize		U.S.A	Chic ago	C/56 lbs.	658.00	630.00	630.50	607.00	601.25	645.50	780.00
				Rs./Qtl	1332.53	1212.94	1260.74	1251.20	1308.34	1411.48	1696.09
Oats		Canada	Winni-peg	Dollar/M.T.	209.31	211.40	211.23	207.59	217.72	215.14	214.03
				Rs./Qtl.	1054.29	1036.07	1076.01	1109.36	1171.12	1176.82	1170.10
Palm Kernal Oil	Crude Malaysian/Indonesia	Nether-lands	— —	Dollar/M.T.	1355.00	1410.00	1370.00	1375.00	1180.00	1070.00	1055.00
				Rs./Qtl.	6982.32	6907.59	6970.56	7211.88	6533.66	5953.48	5837.32
Palm Oil	Crude Malaysian/ Sumatra	Nether-lands	— —	Dollar/M.T.	1063.00	1125.00	1163.00	1178.00	1015.00	1013.0	01003.00
				Rs./Qtl.	5477.64	5511.38	5917.34	6178.61	5620.06	563633	5549.60

3. Month-end Wholesale Prices of Some Important Agricultural Commodities in International Markets During Year, 2012 *(Contd.)*

Commodity	Variety	Country	Centre	Unit	Jan.	Feb.	Mar.	Apr.	May	June	Jul
Rapeseed	Canola	Canada	Winni-peg	Can Dollar/M.T	524.80 2643.42	559.50 2742.11	606.90 3091.55	620.50 3315.95	610.80 3285.49	632.10 3457.59	632.20 3456.24
	U.K. delivered rapeseed, delivered	U.K.	—	Pound/M.T. Rs./Qtl.	365.00 2880.95	372.00 2892.67	394.00 3209.52	397.00 3387.20	364.00 3156.97	378.00 3303.72	392.00 3387.66
Rapeseed Meal	UK produced HP 37% DO, Resell Erith	U.K.	—	Pound/M.T. Rs/Qtl.	171.00 1349.70	176.00 1368.58	166.00 1352.24	178.00 1518.70	197.00 1708.58	199.00 1739.26	221.00 1909.88
Rapeseed Oil	Refined bleached and deodorised	U.K.	—	Pound/M.T. Rs/Qtl.	911.00 7190.52	914.00 7107.26	909.00 7404.71	913.00 7789.72	851.00 7380.72	870.00 7603.80	878.00 7587.68
Soyabean Meal	U.K. produced 49% oil & protein	U.K.	—	Pound/M.T. Rs./Qtl.	264.00 2083.75	269.00 2091.74	302.00 2460.09	292.00 2491.34	354.00 3070.24	365.00 3190.10	404.00 3491.37
Soyabean Oil		U.S.A.	—	C/lbs Rs./Qtl.	52.15 5922.79	54.00 5830.59	55.02 6169.92	55.72 6441.22	50.40 6150.59	50.87 6238.22	54.13 6601.01
	Refined bleached and deodorised	U.K.	—	Pound/M.T. Rs/Qtl.	843.00 6653.80	874.00 6796.22	875.00 7127.75	871.00 7431.37	823.00 7137.88	834.00 72.89.16	868.00 7501.26
Soyabeans		U.S.A.	—	C/60 lbs Rs./Qtl	1208.50 2285.46	1267.75 2279.33	1370.75 2559.60	1465.00 2820.00	1382.50 2809.35	1471.50 3004.79	1639.00 33238.17
	US No. 2 yellow	Nether-lands	Chi-cago	Dollar/M.T. Rs./Qtl	503.90 2596.60	527.50 2584.22	558.20 2840.12	591.70 3103.47	556.40 3080.79	606.30 3373.45	679.30 3758.57
Sunflower Seed	US hulled ex-store	U.K.	—	Pound/M.T. Rs./Qtl	979.28 7729.46	945.03 7348.55	936.80 7631.17	922.20 7868.21	957.64 8305.61	- -	384.11 3319.48
Sunflower Seed Oil	Refined bleached and deodorised	U.K.	—	Pound/M.T. Rs./Qtl	964.00 7608.85	985.00 7659.36	981.00 7991.23	1004.00 8566.13	1038.00 9002.57	1026.00 8967.24	974.00 8417.31
Tallow	High grade delivered	U.K.	Lon-don	Pound/M.T. Rs./Qtl	550.00 4341.15	550.00 4276.80	550.00 4480.30	550.00 4692.60	570.00 4943.61	570.00 4981.80	570.00 4925.94
Turmeric	Madras finger spot/cif	India	—	Dollar/M.T. Rs./Qtl	4100.00 21127.30	4100.00 20085.90	4100.00 20860.80	4100.00 21504.50	4100.00 22701.70	850.00 4729.40	850.00 4703.05
Walnuts	Indian light halves	U.K.	—	Pound/M.T. Rs./Qtl	6750.0 53277.75	6300.00 48988.80	6350.00 51727.10	6350.00 54178.20	6350.00 55073.55	6775.00 59213.50	6775.00 58549.55
Wheat		U.S.A.	Chic-ago	C/60 lbs Rs../Qtl	646.50 1222.63	633.00 1138.09	173.65 324.26	632.00 1216.55	683.00 1387.91	727.50 1485.55	885.00 1797.09

Source : Public Ledger.

Exchange Rate

	Jan.	Feb.	Mar.	Apr.	May	June	Jul
US Dollar	51.53	48.99	50.88	52.45	55.37	55.64	55.33
CAN Dollar	50.37	49.01	50.94	53.44	53.79	54.70	54.67
UK Pound	78.93	77.76	81.46	85.32	86.73	87.40	86.42

4. SOWING AND HARVESTING OPERATIONS NORMALLY IN PROGRESS DURING THE MONTH OF SEPTEMBER, 2012

State	Sowing	Harvesting
(1)	(2)	(3)
Andhra Pradesh	Paddy, Jowar, Maize, Tobacco, Groundnut, Mesta and Linseed.	Paddy, Bajra, Ragi, Groundnut, Sesamum and Ginger.
Assam	Paddy, Gram, Pulses, Potato and Linseed,	Paddy and Mesta.
Bihar	Wheat, Barley, Gram, Rapeseed & Mustard, Linseed and Potato.	Paddy, Jowar, Bajra, Maize, Ragi and Sesamum.
Gujarat	Paddy, Gram, Pulses and Potato.	Paddy, Jowar, Groundnut, Bajra and Cotton.
Himachal Pradesh	Wheat, Barley, Gram, Rapeseed & Mustard and Linseed.	Paddy. Bajra, Maize, Pulses, Potato and Groundnut
Jammu & Kashmir	Wheat, Barley, Rapeseed & Mustard and Onion.	Paddy, Bajra, Maize, Small Millets. Pulses, Potato and Chillies.
Karnataka	Jowar, Potato, Tobacco, Linseed, Sweet Potato and Onion.	Kharif Jowar, Ragi, Small Millets, Chillies and Groundnut.
Kerala	Paddy, Pulses and Sesamum.	Paddy, Sweet Potato and lemongrass.
Madhya Pradesh	Wheat, Barley, Gram, Jowar, Rabi Pulses, Potato, Chillies, Rapeseed & Mustard and Onion.	Paddy, Ragi, Kharif Pulses, Potato, Ginger, Chillies and Groundnut.
Maharashtra	Wehat, Gram, Jowar, Barley and Pulses.	Kharif Paddy, Jowar, Bajra, Maize, Groundnut and Sesamum.
Manipur	Wheat Potato and Rapeseed & Mustard.	Sugarcane and late Paddy.
Orissa	Wheat, Jowar, Gram, Rapeseed & Mustard and Linseed.	Paddy, Kharif, Jowar and Sesamum.
Punjab	Wheat and Gram.	Paddy, Cotton, Pulses and Early Sugarcane.
Rajasthan	Wheat, Barley, Rapeseed & Mustard and Linseed.	Jowar, Bajra, Maize, Cotton and Sannhemp.
Tamil Nadu	Paddy, Jowar, Groundnut, Small Millets, Tobacco and Cotton.	Kharif Paddy, Jowar, Maize, Cotton, Tapioca, Mesta and Ginger.
Tripura	Pulses and Potato.	Til.
Uttar Pradesh	Wheat, Barley, Gram, Linseed and Rapeseed & Mustard.	Paddy, Jowar, Bajra, Sesamum and Groundnut.
West Bengal	Wheat, Barley, Rapeseed & Mustard, Tobacco, Chillies, Til, Potato and Pulses.	Paddy, Jute and Red Chillies.
Delhi	Wheat, Barley and Pulses.	Paddy Jowar, Bajra, Maize and Sugarcane.

(K)—Kharif (R)—Rabi

MGIPRRND—4129 Agri./2012—600