सत्यमेव जयते

AGRICULTURAL SITUATION IN INDIA

Since 1948

JULY, 2018

AGRICULTURAL SITUATION IN INDIA

Publication Division

Directorate of Economics
and Statistics
Department of Agriculture,
Cooperation & Farmers Welfare
Ministry of Agriculture & Farmers Welfare
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Subscription

	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 : 23813761, 23813762, 23813764, 23813765
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For submission see last page.

VOL. LXXV **July, 2018** No. 4

CONTENTS

From Editor's Desk

The July 2018 issue of Agricultural Situation in India offers an overview of the recent developmental initiatives of the Government to enable farmers attain higher levels of income and prosperity; the latest agricultural outlook as it unfolds in the general survey section, and two insightful research articles pertaining to the income of women labour households in rural Punjab and cashew nut farming in Tamil Nadu, and one agro-economic research study on the issues of the impact of Soil Health Card Scheme in Maharashtra.

The major initiatives covered in this issue comprise the implementation of Krishi Kalyan Abhiyan in twenty five villages across the country during 1st June to 31st July 2018 to aid, assist and advice farmers on how to improve their farming techniques and raise their income; increase production; doubling farmers' income by 2022 by introducing Model Agricultural Land Leasing Act, e-NAM scheme, micro irrigation, National Agro-Forestry Policy, Soil Health Card scheme, etc.; and the record procurement of 31.91 lakh metric tonnes of pulses and oilseeds by NAFED in 2017-18. Among other important news are the Cabinet's approval for the Three Year Action Plan of Agricultural Education Division and ICAR Institutes for further strengthening and developing higher agricultural education in India; the Cabinet's appraisal of the MoU between India and Denmark for cooperation in the fields of animal husbandry and dairying; meeting between India's Union Agriculture Minister And Uzbekistan's Deputy PM to strengthen bilateral cooperation in agriculture and allied sectors.

So far as the agricultural outlook is concerned, the Wholesale Price Index (WPI) of foodgrains noted a decrease of 2.76 percent in May, 2018 as compared to that in May, 2017. The WPI of cereals, wheat and paddy showed an increasing trend; whereas there was a decline in case of pulses during the same period. The cumulative winter season rainfall in the country has been 10 percent lower than the long period average during 1st June, 2018 to 27th June, 2018. Current live storage in 91 major water reservoirs in the country was 29.75 BCM as against 31.52 BCM of normal storage based on the average storage of last 10 years.

On the academic front, there are two interesting research articles on income of women labour households; and cashew nut farming. The first article analyzes inter-regional levels pattern and distribution of income of women labour households in rural Punjab. The major objectives of this article were: to estimate the region-wise per household and per capita income of the women labourers; to show the region-wise variations in the pattern of income earned from various sources by the women labour households; and to examine the region-wise inequalities in the distribution of household and per capita income prevailing among the women labour households. To realise these objectives, primary data was collected for the year 2016-17 on the basis of multi-stage systematic random sampling technique. The findings of this study are primarily based on the Gini coefficient and Lorenz curve techniques. The results reveal that the average annual income of the women labour households is highest in Doaba region and lowest in Majha regions of Punjab. Women labour households supplement their income with earning from other sources as income from agriculture sector is insufficient to meet the basic needs. The policy implications of this study underline the need for creating sufficient employment opportunities for improving economic condition of the women labour households; to implement employment-oriented programmes to contain seasonal unemployment; to provide loans to the women labour households at a low interest for establishment of various income generating ventures; to organise skill-development programmes for the economic upliftment of women labourers; to initiate land reforms for Scheduled Castes category as a majority of women labourers belong to this category, etc. The second article analyzes the Cashew nut farming in Tamil Nadu. The primary objectives of the study were: to analyze the nature and extent of growth in area, production and productivity of cashew and instability in production of cashew in Tamil Nadu and India; and to analyze the economics and production efficiency of cashew farming in Tamil Nadu. The study is based on primary data collected during February, 2010. The financial feasibility analysis is done by evaluating net present value, benefit-cost ratio and internal rate of return. On the other hand, efficiency of production of irrigated and dry cashew crops is measured on the basis of a stochastic frontier production function, namely, Cobb-Douglas form of production function. In policy perspective, the study suggests to strengthen the backward and forward linkages for introducing an intercrop, which would be an additional source of income and also generate further employment for the farmers; to follow proper dosage of manures and fertilizers with the help of Cashew Development Council and Cashew Research Stations; to maintain optimum plant population, replace old-aged plants with high yielding varieties, proper agronomic practices so that farmers can reach the optimum yield and reduce the production cost; to boost the cashew exports by providing more price incentives and adequate storage and processing infrastructure, etc.

The Agro-Economic research study shared in this issue is a report on the impact of Soil Health Card Scheme (SHCS) on production, productivity and soil health in Maharashtra, prepared by AERC, Gokhale Institute of Politics and Economics, Pune. The main objectives of this study were: to document the status and implementation of SHCS in Maharashtra; and to analyze the impact of the adoption of soil testing technology and recommended doses of fertilizers on the basis of SHCs on crop production, productivity and soil health in Maharashtra. To realise these objectives, both primary and secondary level data were collected. The policy implications of this study suggest to create awareness about SHCS, the grid system of soil sample collection, SHCs and Integrated Nutrient management and their importance among farmers; train the farmers about the application of various fertilizers at the beginning and during the season; encourage interaction between the farmers and the officials at regular intervals for the dissemination of information about recommended doses of nutrients and their importance in increasing yields of the crops; distribute SHCs in time before the beginning of the season so that farmers have recommendations about basal doses also, etc.

P. C. Bodh

Farm Sector News

Milk production in the country increased by 23.69% in 2014-18 as compared to 2010-14

The Union Agriculture & Farmers Welfare Minister, Shri Radha Mohan Singh, during World Milk Day Celebration at Pusa, New Delhi, stated that it is a matter of pride that our country has been leading the world in milk production and all this is due to the hard work of our farmers. In comparison to 2010-14, milk production in the country has increased by 23.69% during the period 2014-18 (taking projected figures of milk production for 2017-18). An annual increase in milk production is 6.3% during the period 2014-18 while annual increase in milk production during the period 2010-14 was 4%.

The Union Agriculture Minister mentioned that considering the commitment of the Hon'ble Prime Minister to double farmers' income by the 75th anniversary of Independence, i.e., in 2022, the Department is implementing various government schemes. Productivity is one of the biggest challenges for our country and in this direction, efforts are being made to increase milk production by raising the productivity of our milch animals.

Shri Singh further stated that during the last four years under Rashtriya Gokul Mission, 20 Gokul Grams have been sanctioned and out of this, 3 have been completed and work is under progress at remaining 17 Gokul Grams. Two National Kamdhenu Breeding Centres, one in southern India in Andhra Pradesh at Chintaladevi and other in northern India in Madhya Pradesh at Itarsi, are being established. Work at AP has been completed and work is under progress at Itarsi, MP.

The Union Agriculture Minister further mentioned that as on date, 1831 bulls have been produced and out of this, 1752 bulls have been inducted at the semen stations. Similarly, 26 semen stations have been strengthened and their semen production capacity has increased to 150 million doses per annum. In order to enhance productivity using semen of elite bulls, 5046 AI technicians (MAITRIs) have been trained and established in villages.

He also mentioned that 9 crore milch animals are being identified by UID for which suitable funds have already been released by the Central Government. There is also a provision of providing Nakul Swasthaya Patra to the animals under the scheme. So far, one crore animals have already been identified till date.

Under advanced reproductive techniques, 20 Embryo Transfer centres are being established, against which proposals for 18 centres have been approved. 10 semen centres have been identified for production of Sex Sorted Semen. Two proposals have been sanctioned. With this, more female animals would be produced that would help in raising milk production farmers income.

He also informed that E-Pashu Haat Portal has been developed and till date on E-pashu haat portal, a total of 7.63 Crore Semen doses has been produced, 5.57 Crore semen doses have been sold and information about 80,059 Live Animals is available on the portal.

Dairy Entrepreneurship Development Scheme has a provision to provide financial assistance for generating self-employment opportunities in various activities. Under the scheme, 3,30,125 dairy units have been set up so far, for which Rs. 1338.31 crore subsidy has been provided by the Government of India. It has benefited about 6.60 lakh beneficiaries.

Shri Singh stated that from current year, "Dairy Processing and Infrastructure Development Fund (DIDF)", with a total outlay of Rs.10881 Crore where Cooperatives would be provided loans at 6.5% annual interest to be repaid within a period of 10 years has been launched. TheGovernment of India has made a provision of offering interest subsidy. This scheme targets to benefit 95 lakh milk producers through coverage of 50000 villages. Many skilled, semi-skilled and unskilled workers would get direct or indirect employment opportunity under the scheme. Under this scheme, additional milk processing capacity of 126 lakh litres per day with 210 tonnes milk drying capacity per day and 140 lakh litres of milk chilling capacity per day would be created by the establishment of bulk milk

Source: www.pib.nic.in

coolers. The scheme also has a provision for 28000 electronic milk adulteration testing equipment and the facilities to convert 60 lakh liters of milk per day into value-added milk products. So far, during the current year, 10 projects of Rs. 1148 crore have been approved.

Krishi Kalyan Abhiyan was implemented in 25 villages in each of the 111 Aspirational Districts from 1st June to 31st July, 2018

The Ministry of Agriculture and farmers welfare, in line with the Hon'ble Prime Minister Shri Narendra Modi's vision of doubling farmers' income by 2022, has launched the Krishi Kalyan Abhiyaan from 1st June, 2018 till 31st July, 2018 to aid, assist and advice farmers on how to improve their farming techniques and raise their incomes. The Krishi Kalyan Abhiyaan was undertaken in 25 Villages with more than 1000 population each in aspirational districts identified in consultation with the Ministry of Rural Development as per directions of NITI Ayog. In districts, where number of villages (with more than 1000 population) is less than 25, all villages were covered.

An Action Plan comprising specifically identified activities under various Departments of the Ministry namely, Department of Agriculture, Cooperation & Farmers Welfare (DAC&FW), Animal Husbandry Dairying & Fisheries (DAHD&F) and Department of Agricultural Research & Education (DARE-ICAR) was implemented to saturate these 25 villages in each district with these activities.

The overall coordination and implementation in the 25 villages of a district was done by Krishi Vigyan Kendra of that district. 111 officers had also been made in-charge of one district each for overall coordination and field level monitoring. These officers had been selected from subordinate/ attached/autonomous organizations/PSUs, etc., of Ministry of Agriculture & Farmers Welfare.

Various activities to promote best practices and enhance agriculture income were undertaken under this plan such as:-

- Distribution of Soil Health Cards to all farmers.
- 100% coverage of bovine vaccination for Foot and Mouth Disease (FMD) in each village.
- 100% coverage of Sheep and Goat for the eradication of Peste des Petits Ruminants (PPR).
- Distribution of Mini Kits of pulses and oilseeds to all.
- Distribution of Horticulture/Agro-Forestry/ Bamboo plant @ 5 per family(location appropriate).
- Making 100 NADAP Pits in each village.
- Artificial insemination saturation.
- Demonstration programmes on Micro- irrigation.
- Demonstrations of integrated cropping practice.

In addition, demonstration programmes on Micro Irrigation and Integrated Cropping Practice also took place so as to familiarize farmers with the latest techniques and how they can be incorporated at the grass root level. Training programmes were conducted in each of the villages by ICAR/KVSs for Bee Keeping, Mushroom cultivation and Kitchen garden. Women participants and farmers were given preference for the training program.

Ministry of Agriculture and Farmers Welfare highlights key initiatives and policies in line with the Hon'ble Prime Minister Shri Narendra Modi's vision of doubling farmers' income by 2022

National Farmers Commission was constituted in February 2004. After that, the National Policy for Farmers was approved on the basis of the Commission's recommendations in the country, which aimed at improving the economic condition of agricultural sector as well as the net income of the farmers. Most of the recommendations had been left in the cold storage during the UPA government. As soon as Prime Minister Shri Narendra Modi led government came to power, an inter-ministerial committee was set up to examine the increase of income of farmers and to accelerate these initiatives. While studying this, the committee started the task of accelerating this work under the direction of Hon'ble Prime Minister, which is as follows -

(A) Model Agricultural Land Leasing Act, 2016 issued to States, which is a very important step in terms of agricultural reforms through which not only the needs of landlords but the needs of the lease holders are also taken care of. Through this act, land holders can legally lease the land with mutual consent for agriculture and allied sectors. It is also noted that under any circumstances, no claim on the agricultural land of the lease holder will be valid. From the point of view of the lease recipient, it has been taken care that it is provided institutional credit, insurance, and disaster relief, so that they can invest more and more agriculture.

(B) In April 2016, a new entrance process for revolutionizing agricultural markets started by introducing transparency and competition, by ensuring better value search under national agricultural market scheme (e-NAM).

(C) Agricultural Produce and Livestock Marketing (Promotion and Simplification) Act, 2017 was released on April 24, 2017 for adoption by the States/UTs, which comprises of e-business, the announcement of warehouses, silos, cold storage in the form of sub-yard, rationalization of mandis duty and commission charges and improvements in private sector. In 2018, an amount of two thousand crores rupees has also been proposed through NABARD for the development of 22,000 rural agricultural markets in the country. It is clear here that in relation to the National Agricultural Market, the implementation of the suggestion given after the year 2004 was also done within these 4 years.

(D) The Government has revised them after a detailed study of old schemes and has started the world's largest farmer friendly crop insurance scheme i.e. Pradhan Mantri Fasal Bima Yojana and Weather Based Crop Insurance Scheme. By 2019-20, 50 percent of the gross cropped area is to be covered.

(E) Enhanced substantial increase in the adoption of micro irrigation has been recorded. Compound annual growth rate of micro irrigation (MI) coverage is 15 percent. During the year 2017-18, about 9.26 lakh hectare area has been brought under MI, which is the maximum coverage so far received in a calendar year. The target is to cover 1.5 to 2 million hectare per year by the year 2022-23. In addition to the increase in budgetary allocation, a corpus fund of 5,000 crore has also been set up.

(F) National Agro-Forestry Policy has been prepared for increasing the income of farmers and for achieving climate support. During the year 2016-17, a special scheme "Agriculture Forestry Sub-mission" was started and operated with the aim of "Har Medh Par Pedh". Exemption in transit regulations for assistance under the Agriculture Forestry Sub-Mission is a pre-requisite. 21 states (8 states in the year 2016-17 and 12 states in the year 2017-18) have given exemption to this regulation and all the states are being motivated in this direction.

(G) The reconstituted National Bamboo Mission-National Bamboo Mission (NBM) was initially started as a centrally sponsored scheme in the year 2006-07 and brought it under the Integrated Horticulture Development Mission (MIDH) during the year 2014-15, and was continued till the year 2015-16. This scheme is mainly limited to the cultivation and promotion of bamboo due to limited weather and purification units and bamboo market. The main drawbacks of this scheme were lack of contact between producers (farmers) and industries. The Indian Forest Act, 1927 was amended last year, from which the bamboo sown outside the forest area has been removed from the definition of 'trees' and the implementation of National Bamboo Mission reorganized with the outlay of Rs.1290 crore is also being done.

(H) The Government has started the largest Universal Soil Health Card scheme in the world to provide information on the fertility of the land to the farmers on the basis of tested soil samples according to 12 parameters. A study shows that due to the recommendations of the Soil Health Card, due to the application of fertilizer and micro-nutrients, a decrease of chemical fertilizer application has been found ranging from 8 to 10 percent and the total crop production has increased by 5-6 percent.

(I) Traditional Agricultural Development Scheme (PKVY) - PKVY is being implemented with the objective of encouraging organic farming in the country. It will improve soil health and biological content and increase the net income of farmers so that premium values can be identified. The progress of targeted 50 acres (2015-16 to 2017-18) is remarkable. Now it has been started on a cluster base (about 1000 hectares). It is worth noting that on the recommendation of the National Farmers Commission to promote sustainable agriculture, it was also institutionally and systematically implemented at the time of the Modi Government.

(J) Central Regional Scheme has been introduced by identifying the potential of organic farming in the North Eastern Region of the country and Biological Value Chain Development Mission (MOVCDNER) for the North East Region. The Northeast is being developed as the biological center of India.

(K) The present government has released the Model Contract Farming and Services Act, 2018 in 2018, which for the first time has been added to the country's food additives farmers and agro-based industries. Through this act, where a young farmer

can get good prices for the farmers, the losses will also be reduced after harvesting. Besides, employment opportunities will also be created in rural areas. Through this, FPA / FPC will be promoted.

(L) In the year 2003-2005, the scientists of this country had said that 100% neem coated to coated urea was also lying in cold storage which was completed in two years after the arrival of Shri Narendra Modi-led NDA government.

Cabinet approved Three Year Action Plan of Agricultural Education Division & ICAR Institutes

The Union Cabinet, chaired by Prime Minister Shri Narendra Modi, approved the continuation of the Three Year Action Plan (2017-2020) of the scheme for Agricultural Education Division and ICAR Institutes with an outlay of Rs.2225.46 crore [Rs. 2197.51 crore + Rs. 27.95 crore (State share) as salary component for AICRP-HS] for strengthening and developing higher agricultural education in India. It comprises of:

i. "Strengthening and Development of Higher Agricultural Education in India - Rs. Rs.2050.00 crore;
ii. ICAR-National Academy of Agricultural Research Management (NAARM) - Rs. 24.25 crore; and
iii. ICAR - Central Institute of Women in Agriculture (CIWA) including All India Coordinated Research Project on Home Science (AICRP-HS) - Rs.151.21 crore.

The scheme is aimed to generate quality human resources from the institutions of higher agricultural education.It encompasses several new initiatives including, steps to attract talented students, reducing academic inbreeding and addressing faculty shortage. It would also take care of green initiatives, mitigating faculty shortage, international ranking, alumni involvement, promoting innovations, inspired teacher network, reducing inbreeding, academia interface, technology enabled learning, Post-doctoral Fellowships, Agriculture Education Portal, Scientific Social responsibility etc. for quality assurance ranking of the agricultural universities has been linked to the financial support under the scheme along with accreditation. Support for strengthening and modernization of infrastructure related to student and faculty amenities and capacity building of both faculty and students in cutting edge areas through Niche Area of Excellence programme would improve teaching and encourage holistic development of the students.

This will lead to a generation of competitive and confident human resource. In addition, research on gender issues in agriculture and allied fields, formulating gender-equitable agricultural policies/ programmes and gender-sensitive agricultural-sector responses would be undertaken by ICAR-CIWA and capacity building needs of the human resources and stakeholders of the entire National Agricultural Research & Education System (NARES) will be catered leading to enhancing of competencies and capacities of the stakeholders including farmers, young scientists, students and agri-industry in NARES by ICAR-NAARM.

NAFED made record procurement of 31.91 lakh metric tonnes of pulses and oilseeds in 2017-18 benefiting over 20 lakh farmers

The National Agricultural Cooperative Marketing Federation of India Ltd. (NAFED), which procures pulses, oilseeds and onion from farmers, procured 31.91 lakh metric tonnes of pulses and oilseeds in 2017-18 thereby benefitting over 20 lakh farmers. Money was directly transferred to farmers' accounts. NAFED registered record numbers on other financial parameters and in 2018-19, it is expected to earn record profit.

It is worth mentioning that NAFED was financially drained during the previous government. Irregularities had pushed it into a financial crisis and the institution was on the verge of closure with lawsuits piling up. The federation had procured only 8 lakh metric tonnes of pulses and oilseeds from farmers in the last four years (2011-14) of the UPA government. Owing to the efficient leadership of the NDA government, 64 lakh metric tonnes of pulses and oilseeds were procured at Minimum Support Price (MSP) from farmers in 2014-18, thereby showing a remarkable increase.

It was imperative for the government to save NAFED and ensure procurement at MSP in order to help farmers. On the advice of Hon'ble Prime Minister Shri Narendra Modi, the bank guarantee of NAFED was increased to Rs 42,000 crore with immediate effect. The bank guarantee during the UPA government was only Rs 200-250 crore.

The result of the reforms has been very positive. In the three crop seasons in the middle of 2011-13, NAFED could not procure anything but is now making record purchases. For this, the government did away with 15 per cent compensation in the MSP norm, which existed in the previous government on account of complete loss. With the availability of bank guarantee to NAFED, it was possible to make record purchase from farmers. Reflecting the results of financial discipline and improvement, NAFED paid Rs 220 crore to the banks from its earnings. Minister of Agriculture and Farmers' Welfare Shri Radha Mohan Singh expressed hope that NAFED will continue to make record purchase from farmers and said that the government is committed to improving the condition and working of NAFED.

The Union Agriculture Minister exhorted farmers to accelerate their pace of income generation by adopting new technologies

The Hon'ble Prime Minister, Shri Narendra Modi, interacted with farmers across the country through video bridge on 20th June, 2018. Crores of farmers listened in rapt attention to the interaction which was held through KVKs in 600 districts and Common Service Centre in 2 lakh villages. The Union Minister of Agriculture and Farmers' Welfare Shri Radha Mohan Singh witnessed this interaction with farmers in Shikohpur village in Haryana.

Interacting with the Hon'ble Prime Minister, beneficiaries of various agricultural schemes explained how various government schemes helped improve production. Beneficiaries also highlighted the importance of Soil Health Card and shared their experiences of cooperative movement.

The Union Agriculture Minister said it was heartening to listen to stories on how farmers across the nation have increased their income through Soil Health Card, Micro Irrigation, Value Addition, eNAM, FPO alongside Animal Husbandry, Fisheries & Poultry. Farmers also shared stories on how they have doubled their income by adopting integrated farming.

Shri Singh exhorted farmers to accelerate the pace of their income generation by adopting new technologies. He also said that along with KVKs, ATMA officials will have to work together to bring new technology to our fields. Farmers from across the nation expressed their gratitude to the Hon'ble Prime Minister for his guidance in the interaction.

Cabinet apprised the MoU between India and Denmark for cooperation in the fields of Animal Husbandry and Dairying

The Union Cabinet, chaired by Prime Minister Shri Narendra Modi, apprised the Memorandum of Understanding (MoU) signed between India and Denmark for cooperation in the fields of Animal Husbandry and Dairying. The MoU was signed on 16.4.2018. The MoU aims to develop bilateral cooperation in the field of Animal Husbandry and Dairying for the purpose of broadening the existing knowledge base on dairy development and institutional strengthening. A Joint Working Group (JWC) consisting of representatives of each party shall be created to formulate joint programmes, facilitate cooperation and consultation and subsequent evaluation. Danish partnership is expected to facilitate exchange of knowledge & expertise in the areas of animal breeding, animal health and dairying, fodder management, etc. aiming at enhancing production and productivity of Indian livestock including livestock trade matter of mutual interest.

The Union Agriculture Minister Shri Radha Mohan Singh met Deputy PM of Uzbekistan, Mr. Suhrob Kholmuradov to strengthen bilateral cooperation in agriculture & allied sectors

The Union Minister of Agriculture and Farmers Welfare Shri Radha Mohan Singh met Mr. Suhrob Kholmuradov, Deputy Prime Minister, Uzbekistan and Chairman of the State Investment Committee in Krishi Bhawan, New Delhi on 27th June, 2018 and sought to strengthen bilateral cooperation in agriculture and allied sectors.

The Union Agriculture Minister reiterated India's tremendous progress in the agriculture sector and its commitment to double farmers' income by 2022 through a series of reforms, namely Soil Health Card, Organic Farming, Crop insurance, irrigation, eNAM etc. He said India has become one of the most preferred investment destinations of the world.

Shri Singh said, "We are ready to partner with Uzbekistan in providing training and sharing expertise in skill development, effective and optimum use of water for dry lands, integrated

farming systems, mechanization and farm machinery," adding India can provide training to Uzbekistan for the development of Green House with the help of Centre of Excellence (CoE).

India is currently importing moong, natural gum, walnut, chickpeas, and juices from Uzbekistan. The Union Minister urged Mr. Suhrob to also consider importing mango, potato, wheat, meslin, sugar, etc. from India.

Shri Singh stressed on the importance of constitution of agricultural clusters for small and marginal farmers and fragmented land holdings and offered to share India's experience in the formation of FPOs and cooperatives in order to ensure better returns to farmers. He also assured the Deputy Prime Minister that the revised draft agreement on cooperation in the field of Plant Quarantine as proposed by Uzbekistan is under active consideration.

The Minister also called for the need to promote interaction among government agricultural institutions, experts, scientists and agro business. He further expressed interest to work together in the area of animal husbandry and was willing to assist in setting up food processing industries in Uzbekistan.

Kharif crop sowing crossed 165.21 lakh hectare area

The total sown area as on 29th June 2018, as per reports received from States, stands at 165.21 lakh hectare as compared to 210.75 lakh hectare at this time last year. It is reported that rice has been sown/ transplanted in 26.91 lakh ha, pulses in 10.72 lakh ha, coarse cereals in 23.89 lakh ha, sugarcane in 50.01 lakh hectare and cotton in 32.20 lakh ha.

The details of the area covered so far and that covered during this time last year are given below:

(In Lakh hectares)

Crop	Area sown in 2018-19	Area sown in 2017-18
Rice	26.91	30.02
Pulses	10.72	18.18
Coarse Cereals	23.89	34.02
Oilseeds	14.55	26.00
Sugarcane	50.01	49.48
Jute & Mesta	6.93	6.94
Cotton	32.20	46.10
Total	**165.21**	**210.75**

General Survey of Agriculture

Trends in Foodgrain Prices

Based on Wholesale Price Index (WPI) (2011-12=100), foodgrains price decreased by (-) 2.76 per cent, in May, 2018 over May, 2017. During the same period, the WPI of pulses decreased by (-) 21.13 per cent, whereas WPI of cereals, wheat and paddy increased by 1.68 per cent, 3.05 per cent and 4.19 per cent.

The WPI of pulses showed fall of (-) 0.83 per cent, respectively, in May, 2018 over April, 2018. During this period the WPI of foodgrains, cereals, wheat and paddy increased by 0.28 per cent, 0.55 per cent, 0.57 per cent and 0.59 per cent, respectively.

Rainfall and Reservoir Situation
Rainfall Situation

Cumulative South-West Monsoon Season, 2018 rainfall for the country as a whole during the period 1st June, 2018 to 27th June, 2018 has been 10% lower than the Long Period Average (LPA). Rainfall in the four broad geographical divisions of the country during the above period has been higher than LPA by 17% in South Peninsula but lower than LPA by 26% in East & North East India, 20% in North-West India and 6% in Central India.

Out of total 36 meteorological Sub-divisions, 6 met sub-divisions received Large Excess/Excess rainfall, 18 sub-divisions received Normal rainfall and 12 sub-divisions received Deficient/Large Deficient rainfall.

Out of 653 districts for which rainfall data available, 37(6%) districts received Large Excess rainfall, 100(15%) received Excess rainfall, 195(30%) received Normal rainfall, 198(30%) districts received deficient rainfall and 114(18%) received Large Deficient rainfall.

Water Storage in Major Reservoirs

Central Water Commission monitors 91 major reservoirs in the country which have total live capacity of 161.99 Billion Cubic Metre (BCM) at Full Reservoir Level (FRL). Current live storage in these reservoirs (as on 28th June, 2018) was 29.75 BCM as against 29.42 BCM on 28.06.2017 (last year) and 31.52 BCM of normal storage (average storage of last 10 years). Current year's storage is 101% of last year's storage and 94% of the normal storage.

Sowing Position during Kharif, 2018

As per latest information available on sowing of Kharif crops upto 29.06.2018, area sown under Kharif crops taken together has been reported to be 165.21 lakh hectares at All India level which is lower by 45.54 lakh ha. than the area coverage of 210.75 lakh hectares during the corresponding period of last year.

Area reported under sugarcane has been marginally higher by 0.53 lakh ha. as compared to its coverage during the corresponding period of last year.

Economic Growth

The provisional estimates (PE) of national income released by Central Statistics Office (CSO) on 31st May 2018, estimated the growth of Gross Domestic Product (GDP) at constant market prices for the year 2017-18 to be 6.7 per cent (Table 1). The growth rate of GDP at constant market prices was 7.1 per cent (first revised estimate) in 2016-17 and 8.2 per cent in 2015-16 (second revised estimate).

The growth in Gross Value Added (GVA) at constant basic prices for the year 2017-18 is estimated to be 6.5 per cent (PE). At the sectoral level, agriculture, industry and services sectors are estimated to grow at the rate of 3.4 per cent, 5.5 per cent and 7.9 per cent, respectively in 2017-18.

As per the quarterly estimates, the growth of GDP at constant prices for fourth quarter (January-March) of 2017-18 was 7.7 per cent, as compared to the growth of 6.1 per cent recorded in the corresponding quarter of the previous year. The upswing in the trend of quarterly growth, which started in the second quarter of 2017-18, sustained with an even higher growth in third and fourth quarters (Table 2).

The share of total final consumption in GDP at current prices in 2017-18 is estimated to be 70.5 per cent, as compared to 69.9 per cent in 2016-17. The

fixed investment rate (ratio of gross fixed capital formation to GDP) is estimated to be 28.5 per cent in 2017-18, which is the same as in previous two years.

The saving rate (measured as a share of gross saving to GDP) for the year 2016-17 was 30.0 per cent, as compared to 31.3 per cent in 2015-16. The investment rate (measured as a share of gross capital formation to GDP) was 30.6 per cent in 2016-17, as compared to 32.3 per cent in 2015-16.

Agriculture and Food Management

Rainfall

There has been no deficiency in the cumulative rainfall received for the country as a whole during the period 1st June 2018 to 18th June 2018. The actual rainfall received during this period has been equal to the normal rainfall of 78.7 mm. Out of the total 36 meteorological sub-divisions, 2 sub-divisions received large excess rainfall, 15 sub-divisions received excess rainfall, 6 sub-divisions received normal rainfall, 11 sub-divisions received deficient rainfall and 2 sub-divisions received large deficient rainfall. No sub-division remained without rainfall during the period.

All India Production of Foodgrains

As per the 3rd Advance Estimates (AE) released by Ministry of Agriculture & Farmers Welfare on 16th May 2018, the production of foodgrains during 2017-18 is estimated at 279.5 million tonnes compared to 275.1 million tonnes in 2016-17 (Final Estimate) (Table 3).

Procurement

Procurement of Rice as on 31st May, 2018 during Kharif Marketing Season 2017-18 was 33.5 million tonnes, whereas procurement of wheat during Rabi Marketing Season 2018-19 was 34.2 million tonnes (Table 4).

Off-take

The offtake of rice all schemes during the month of April, 2018 has been 25.83 lakh tonnes. This comprises 24.52 lakh tonnes under TPDS/NFSA (offtake against the allocation for the month of May, 2018) and 1.31 lakh tonnes under other schemes. In respect of wheat, the total offtake has been 17.87 lakh tonnes comprising of 17.05 lakh tonnes under TPDS/NFSA (offtake against the allocation for the month of May 2018) and 0.82 lakh tonnes under other schemes. The cumulative offtake of food-grains during 2018-19 (upto April) is 9.0 million tonnes (Table 5).

Stocks

The total stocks of rice and wheat held by FCI as on 1st June, 2018 was 73.3 million tonnes compared to 62.2 million tonnes as on 1st June, 2017 (Table 6).

TABLE 1 : Growth of GVA at Basic Prices by Economic Activity and GDP at Market Prices (per cent)

Sectors	Growth Rate at Constant (2011-12) Prices (%)			Share in GVA at Current Prices (%)		
	2015-16 2nd RE	2016-17 1st RE	2017-18 PE	2015-16 2nd RE	2016-17 1st RE	2017-18 PE
Agriculture, forestry & fishing	**0.6**	**6.3**	**3.4**	**17.7**	**17.9**	**17.1**
Industry	**9.8**	**6.8**	**5.5**	**29.8**	**29.3**	**29.1**
Mining & quarrying	13.8	13.0	2.9	2.4	2.4	2.5
Manufacturing	12.8	7.9	5.7	16.8	16.8	16.7
Electricity, gas, water supply & other utility services	4.7	9.2	7.2	2.7	2.6	2.6
Construction	3.7	1.3	5.7	7.9	7.4	7.4
Services	**9.6**	**7.5**	**7.9**	**52.5**	**52.8**	**53.9**
Trade, Hotel, Transport Storage	10.3	7.2	8.0	18.3	18.2	18.5

Sectors	Growth Rate at Constant (2011-12) Prices (%)			Share in GVA at Current Prices (%)		
	2015-16 2nd RE	2016-17 1st RE	2017-18 PE	2015-16 2nd RE	2016-17 1st RE	2017-18 PE
Financial , real estate & prof services	10.9	6.0	6.6	20.9	20.6	20.8
Public Administration, defence and other services	6.1	10.7	10.0	13.2	13.9	14.5
GVA at basic prices	**8.1**	**7.1**	**6.5**	**100.0**	**100.0**	**100.0**
GDP at market prices	8.2	7.1	6.7	---	---	---

Source: Central Statistics Office (CSO).
Notes: 2nd RE: Second Revised Estimates, 1st RE: First Revised Estimates, PE: Provisional Estimates..

TABLE 2 : Quarter-wise Growth of GVA at Constant (2011-12) Basic Prices (per cent)

Sectors	2016-17				2017-18			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Agriculture, forestry & fishing	**4.3**	**5.5**	**7.5**	**7.1**	**3.0**	**2.6**	**3.1**	**4.5**
Industry	**8.3**	**6.8**	**7.1**	**5.0**	**0.1**	**6.1**	**7.1**	**8.8**
Mining & quarrying	10.5	9.1	12.1	18.8	1.7	6.9	1.4	2.7
Manufacturing	9.9	7.7	8.1	6.1	-1.8	7.1	8.5	9.1
Electricity, gas ,water supply & other utility services	12.4	7.1	9.5	8.1	7.1	7.7	6.1	7.7
Construction	3.0	3.8	2.8	-3.9	1.8	3.1	6.6	11.5
Services	**9.4**	**7.9**	**6.5**	**6.3**	**9.5**	**6.8**	**7.7**	**7.7**
Trade, hotels, transport, communication and services related to broadcasting	8.9	7.2	7.5	5.5	8.4	8.5	8.5	6.8
Financial, real estate & professional **services**	10.5	8.3	2.8	1.0	8.4	6.1	6.9	5.0
Public administration, defence and Other Services	7.7	8.0	10.6	16.4	13.5	6.1	7.7	13.3
GVA at Basic Price	**8.3**	**7.2**	**6.9**	**6.0**	**5.6**	**6.1**	**6.6**	**7.6**
GDP at market prices	**8.1**	**7.6**	**6.8**	**6.1**	**5.6**	**6.3**	**7.0**	**7.7**

Source: (CSO).

TABLE 3 : Production of Major Agricultural Crops (3ND ADV. EST.)

Crops	Production (Million Tonnes)					
	2012-13	2013-14	2014-15	2015-16	2016-17 (FINAL)	2017-18 (3nd AE)
Total Foodgrains	**257.1**	**265.0**	**252.0**	**251.6**	**275.1**	**279.5**
Rice	105.2	106.7	105.5	104.4	109.7	111.5
Wheat	93.5	95.9	86.5	92.3	98.5	98.6
Total Coarse Cereals	40.0	43.3	42.9	38.5	43.8	44.9

TABLE 3 : Production of Major Agricultural Crops (3ND adv. est.)-*Contd.*

Crops	Production (Million Tonnes)					
	2012-13	2013-14	2014-15	2015-16	2016-17 (FINAL)	2017-18 (3nd AE)
Total Pulses	18.3	19.3	17.2	16.4	23.1	24.5
Total Oilseeds	30.9	32.8	27.5	25.3	31.3	30.6
Sugarcane	341.2	352.1	362.3	348.4	306.1	355.1
Cotton#	34.2	35.9	34.8	30.0	32.6	34.9

Source: DES, DAC & FW, M/o Agriculture & Farmers Welfare.
Notes: 3nd AE: 3nd Advance Estimates, # Million bales of 170 kgs. each.

TABLE 4 : Procurement of Crops (Million Tonnes)

Crops	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
Rice#	34.0	31.8	32.0	34.2	38.1	33.5	
Wheat@	38.2	25.1	28.0	28.1	23.0	30.8	34.2
Total	**72.2**	**56.9**	**60.2**	**62.3**	**61.1**	**64.3**	**34.2**

Source: FCI and DFPD, M/o Consumer Affairs, Food and Public Distribution.
Notes: Procurement of rice as on 01.05.2018.
 # : Kharif Marketing Season (October-September), @ : Rabi Marketing Season (April-March).

TABLE 5 : Off-take of Foodgrains (Million Tonnes)

Crops	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19 *
Rice	29.2	30.7	31.8	32.8	34.4	5.4
Wheat	30.6	25.2	31.8	29.1	24.8	3.6
Total (Rice & Wheat)	**59.8**	**55.9**	**63.6**	**61.9**	**59.2**	**9.0**

Source: DFPD, M/o Consumer Affairs, Food and Public Distribution.
Note: up to April 2018.

TABLE 6 : Stocks of Foodgrains (Million Tonnes)

Crops	1st June 2017	1st June 2018
1. Rice	22.1	24.3
2. Unmilled Paddy#	10.1	7.9
3. Converted Unmilled Paddy in terms of Rice	**6.7**	**5.2**
4. Wheat	**33.4**	**43.8**
Total (Rice & Wheat)(1+3+4)	**62.2**	**73.3**

Source: FCI.
Note: # Since September 2013, FCI gives separate figures for rice and unmilled paddy lying with FCI & state agencies in terms of rice.

Articles

Inter-regional Analysis of Levels, Pattern and Distribution of Income of Women Labour Household in Rural Punjab

VEERPAL KAUR[1], DHARAMPAL[2], JYOTI[3], GURINDER KAUR[4] AND GIAN SINGH[5]

Abstract

Based on primary data collected from 1017 women labour households spread over three regions of Punjab during 2016-17, the present study has clearly brought out that average annual income of the women labour households is the highest, i.e., Rs. 82433.18 in Doaba and the lowest, i.e., Rs. 73819.69 in Majha. It is Rs. 76752.84 in Malwa. The reason for the highest annual per household income in Doaba is that income from the other sources such as construction work, self-employment, white-washing, dairying, tailoring and remittances is higher than the other two regions. The major proportion of the income of the women labour households comes from hiring out labour in agriculture in Malwa and Majha. During the field survey, it has been observed that in Malwa especially in Mansa district, relatively more male members of these households are contractual labourers in agriculture as compared to the other two regions. However, income from agricultural sector is too low to meet the basic needs of the women labour households in all the three regions. Therefore, the earning members of the women labour households are also struggling hard to earn their income from other sources. The comparison between the distribution of per household and per capita income shows that it is relatively fair in the case of per household income in all the three regions. Policy measures for creating sufficient non-farm employment opportunities; providing low interest loans for small ventures; government and non-government initiatives for skill development; and specific focus on Scheduled castes in view of predominance of Scheduled caste families in labour households are suggested.

Keywords: *Women labourers, Domestic servants, MGNREGA, Contractual labour, Casual labour, Rural Punjab.*

1. Introduction

After more than six decades of planned economic development and a high rate of growth over the last two decades, the Indian economy still remains predominantly rural. According to the Census 2011, 68.84 percent of the population in India was rural. Within rural India, agriculture still continues to be the dominant occupation. During the last few decades, especially since the early 1990s as a part of the neo-liberal wave of globalization, there has been a general increasing tendency in the number of labour households. This is so because of the stagnation or slow growth in the agricultural sector and jobless growth in the non-agricultural sector. Because of the casual nature of employment, the income level of the labour class continues to be relatively low. Income of the male labourers is not enough to meet the basic necessities of the family. As a result, women labourers have to supplement the income of their husbands. A general pattern is that work participation rate has a declining trend with rising economic status of rural women, clearly reflecting on the economic distress that compels poor women to work (Srivastava and Srivastava, 2009; and Kelkar, 2011).

A number of studies (Abhishek et al., 2014; Anonymous, 2008; Rajasekhar et al., 2007; Balakrishnan, 2005; Sandhu, 2002; Tuteja, 2000; Padma, 1999; Tripathy, 1996; Rani et al., 1990) indicate that almost all the women labourers are illiterate, unskilled, socially backward and economically weak which force them to work in the unorganised sector without fair wages and occupational amenities. They have very few opportunities to seek employment in the non-agricultural sector. They can find employment only in occupations which need a

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Note: The authors are thankful to the Bebe Gurnam Kaur Memorial Education Centre, Isru, Ludhiana for sponsoring this study.

skill of very low level. Some of them are exploited economically as well as physically. Domestic women labourers get a paltry sum for unpleasant work they perform.

The state of Punjab, being an agrarian state, agriculture has played a pivotal role in its economic development. Through the introduction of Green Revolution since the sixties, the state has achieved a top most place for its higher economic growth. But this success could not achieve a sustainable economic growth as the state lagged much behind since 1991-92 on various fronts. No doubt, the mechanisation, modernisation and technological changes have boosted employment on the one side while on the other side, it has created huge unemployment among the labourers especially women workers (Kaur and Kaur, 2017). As per the Census 2011, the workforce participation rate of females in Punjab is 13.90 percent, while the male work participation rate is 55.20 percent as compared to national average where corresponding figures were 25.50 and 53.30 percent, respectively. The workforce participation rate of females in Punjab is about four times lower than their male counterparts in the state and nearly two times lower than female work participation rate at the national level (Anonymous, 2012).

1.1. Objectives

In the present study, an endeavour has been made to highlight the inter-regional variations in the levels, pattern and distribution of income of the women labour households in the rural areas of Punjab. More specifically, the aims are:

1) To estimate the region-wise per household and per capita income of the women labourers;

2) To exhibit the region-wise variations in the pattern of income earned from various sources by the women labour households; and

3) To examine the region-wise inequalities in the distribution of household and per capita income prevailing among the women labour households.

This paper is divided into four Sections. Section 1 provides introduction. Section 2 describes data and methodology. Results are presented in section 3. Section 4 concludes the study with pertinent policy implications.

2. Data and Methodology

The present study based on multi-stage systematic random sampling technique is related to the year 2016-17. For the purpose of present study, four districts have been selected from the three geographical regions of Punjab, namely, Majha, Doaba and Malwa. Majha and Doaba comprise four districts each whereas Malwa forms a major part of the Punjab state and consists fourteen districts. Amritsar district has been selected from the Majha region; Jalandhar district from the Doaba region; whereas two districts, namely, Mansa and Fatehgarh Sahib, have been selected from the Malwa region. The map of the study area is depicted in Figure 1.

Figure 1
Map of the Study Area

At the next stage, one village from each development block of the selected districts has been chosen on the basis of the Random Sampling technique. From these villages, 1017 women labour households were randomly selected and investigated, by taking 15 percent households from the total number of women labour households. Out of 1017 respondents, a majority of the women labourers, i.e., 92.43 percent belong to the Scheduled Caste category, 7.08 percent to the Backward Class category and only 0.49 percent to the General Caste category. The required primary data were collected from the sampled households through a well prepared questionnaire. Since the majority of the women labourers are illiterate, it was decided to fill questionnaires through the interview method. The results were analysed using the mean values and percentages. To support the findings of the study, Gini coefficient and Lorenz curve have also been used.

3. Results and Discussion

The economic status of a family mainly depends upon its level of income. The income levels of the majority of the rural population, especially of the labour class are very low that reduce their purchasing power and compel them to lead a miserable life. The mean values of income earned from various sources by the women labour households in the three regions of Punjab are given in Table 1. The Table clearly depicts that average annual income of the women labour households is the highest, i.e., Rs. 82433.18 in Doaba and the lowest, i.e., Rs. 73819.69 in Majha. It is Rs. 76752.84 in Malwa. The reason for the highest annual per household income in Doaba is that income from the other sources such as hiring out labour in construction work, self-employment, white-washing, working as drivers, dairying, tailoring, mid-day meal worker/ asha worker/ anganwari worker and remittances is higher as compared to the other two regions. The Table further shows that the women labour households, on an average, earn only Rs. 21774.26 in Malwa and Rs. 17766.90 in Majha from hiring out labour (both on contractual as well as casual basis) in agriculture. However, in Doaba, the annual household income is Rs. 17184.04 from this source of income. During the field survey it has been observed that in Malwa especially in Mansa district, relatively more male members of the women labour households are contractual labourers in the agricultural sector as compared to the other two regions.

TABLE 1 : LEVELS OF INCOME OF WOMEN LABOUR HOUSEHOLDS: REGION-WISE

(Mean Values in Rs., Per Annum)

Source of Income	Malwa	Doaba	Majha
1. Income from hiring out labour in agriculture			
A. On contractual basis			
(i) Cash	3149.51	615.38	1931.23
(ii) Kind			
(a) Agricultural produce	178.92	46.15	97.42
(b) Meals	216.42	34.62	128.94
(c) Tea and milk	155.88	23.08	71.63
(d) Clothes and other commodities	56.37	11.54	28.65
B. On casual basis			
(i) Cash	17823.77	16260.77	15345.70
(ii) Kind			
(a) Agricultural produce	129.66	107.88	51.58
(b) Meals	0.00	0.00	0.00
(c) Tea and milk	36.76	69.23	67.34
(d) Clothes and other commodities	26.97	15.39	44.41
Sub-total (1)	21774.26	17184.04	17766.90
2. Income from other sources			
(i) Hiring out labour in construction work	14532.23	19762.69	16315.19
(ii) Hiring out labour in brick-kiln work	1854.00	1683.15	2855.01
(iii) Hiring out labour as domestic servants			
(a) Cash	2772.55	3225.77	4283.67
(b) Kind	1085.26	883.85	912.61
(iv) Hiring out labour under MGNREGA	7893.73	5076.98	3855.24
(v) Self-employment	4396.13	6420.77	5187.97
(vi) Dairying	1252.87	1794.23	843.27
(vii) Piggery and poultry	36.76	26.92	16.26

Source of Income	Malwa	Doaba	Majha
(viii) Livestock	1928.74	2195.77	1446.69
(ix) Salaries	7267.65	6923.85	5862.46
(x) Working as drivers	1955.88	2357.69	2117.48
(xi) Vending vegetables/fruits	1357.84	1678.51	1986.25
(xii) White-washing	2208.33	3757.69	1843.84
(xiii) Remittances	0.00	323.08	0.00
(xiv) Mid-day meal worker/asha worker/anganwari worker	0.00	750.77	382.52
(xv) Tailoring	529.41	1476.92	703.15
(xvi) Auto/rickshaw pulling	482.43	2537.43	3942.69
(xvii) Labour in grain market	1281.86	1442.30	715.19
(xviii) Others*	827.22	196.16	0.00
Sub-total (2)	51662.89	62514.53	53269.49
3. Transfer Income			
(i) Pensions	2379.41	1792.31	2063.04
(ii) Scholarships	862.75	942.30	682.98
(iii) Help from relatives/friends	73.53	0.00	37.28
Sub-total (3)	3315.69	2734.61	2783.30
Total (1+2+3)	76752.84	82433.18	73819.69

Source: Field Survey, 2016-17

*Note: *Others include income from tree cutting, cooking in functions, etc.*

Income from hiring out contractual labour in agriculture is solely earned by male labourers. From the field survey, it has been observed that not even a single woman in the sample was employed in the agricultural sector as a contractual labourer. This is so because women have to look after their children, domestic chores and livestock at home. The field survey also reveals another factor responsible for this phenomenon, i.e., hiring out women labour on contractual basis is against the social norms since the contractual labourers are supposed to stay at farm even during the nights. On the other side, the income from hiring out casual labour in agriculture is earned by both male and female labourers.

It is deplorable to note that income from hiring out labour on contractual and casual basis in agriculture is too low to meet the basic necessities of the women labour households. Most of the time, the agricultural labourers have to remain unemployed or in search for other sources of income. This is the reason that the earning members of these households are also struggling hard to earn their income from other sources. Another research study (Kaur and Mavi, 2015) also shows the similar phenomenon that usually the male members of the agricultural labour households migrate to other places for better paid work but women labourers are forced to accept the low paid work in the village as they cannot migrate as easily as men. Income earned from other sources comes to be the highest, Rs. 62514.53 in Doaba and the lowest, i.e., 51662.89 in Malwa. It is Rs. 53269.49 for Majha.

Among the other sources, the first rank goes to the income from hiring out labour in construction work in all the three regions. Income from this source is the highest, i.e., Rs. 19762.69 in Doaba and the lowest, i.e., Rs. 14532.23 in Malwa. It is Rs. 16315.19 for Majha. The next major source of income of women labour households is income from salaries, followed by hiring out labour under MGNREGA, self-employment, domestic servants, white-washing, auto/rickshaw pulling, hiring out labour in brick-kiln work, working as drivers, livestock, vending vegetables/fruits, dairying, labour in grain market and tailoring in all the three regions. An average woman labour household earns a very small amount of income from piggery & poultry, remittances, mid-day meal worker/asha worker/anganwari worker and others in all the three regions. The presence of income from hiring out labour under MGNREGA

indicates some supportive role being played by the government-sponsored poverty alleviation programmes. This fact matches the empirical finding of another research study (Singh et al., 2016) which shows that majority of the MGNREGA beneficiaries found the scheme (MGNREGA) to be socially and economically beneficial for the women workers in the rural areas of Punjab.

An average woman labour household receives Rs. 3315.69, Rs. 2783.30 and Rs. 2734.61 as transfer income in Malwa, Majha and Doaba, respectively. In this source, pensions are relatively more important in all the three regions of the state.

3.1. Patten of Income: Region-wise

The region-wise details of the relative shares of income from the different sources are given in Table 2. It is clear from the Table that the major proportion of the income of the women labour households comes from hiring out both contractual and casual labour in agriculture in Malwa and Majha. However, this pattern is not noticed in Doaba. In Doaba, the major part of the total income comes from the other source such as hiring out labour in construction work.

The proportionate share of annual income from hiring out labour (both on contractual as well as casual basis) in agriculture is the highest in Malwa (28.37 percent), followed by Majha (24.07 percent) and Doaba (20.85 percent). This is because of the reason that the income from hiring out contractual labour in agriculture is comparatively more in Malwa as compare to the other two regions, that turns out to be a regular source of income to the women labour households in this region. Further, less than 30 percent of annual income from agriculture in all the three regions brings out the fact that stagnation of agriculture has also adversely affected the income pattern of labour class in the rural areas of Punjab. Therefore, the earning members of the women labour households are struggling hard to earn their income from other sources.

TABLE 2 : INCOME PATTERN OF WOMEN LABOUR HOUSEHOLDS: REGION-WISE

(Percentage of Total Income)

Source of Income	Malwa	Doaba	Majha
1. Income from hiring out labour in agriculture			
A. On contractual basis			
(i) Cash	4.10	0.75	2.62
(ii) Kind			
(a) Agricultural produce	0.23	0.06	0.13
(b) Meals	0.28	0.04	0.17
(c) Tea and milk	0.20	0.03	0.10
(d) Clothes and other commodities	0.07	0.01	0.04
B. On casual basis			
(i) Cash	23.22	19.73	20.79
(ii) Kind			
(a) Agricultural produce	0.17	0.13	0.07
(b) Meals	0.00	0.00	0.00
(c) Tea and milk	0.05	0.08	0.09
(d) Clothes and other commodities	0.05	0.02	0.06
Sub-total (1)	**28.37**	**20.85**	**24.07**
2. Income from other sources			
(i) Hiring out labour in construction work	18.93	23.97	22.10
(ii) Hiring out labour in brick-kiln work	2.42	2.04	3.87
(iii) Hiring out labour as domestic servants			
(a) Cash	3.61	3.91	5.80

Source of Income	Malwa	Doaba	Majha
(b) Kind	1.41	1.07	1.24
(iv) Hiring out labour under MGNREGA	10.28	6.16	5.22
(v) Self-employment	5.73	7.79	7.03
(vi) Dairying	1.63	2.18	1.14
(vii) Piggery and poultry	0.05	0.03	0.02
(viii) Livestock	2.51	2.66	1.96
(ix) Salaries	9.47	8.40	7.94
(x) Working as drivers	2.55	2.86	2.87
(xi) Vending vegetables/fruits	1.77	2.04	2.69
(xii) White-washing	2.88	4.56	2.50
(xiii) Remittances	0.00	0.39	0.00
(xiv) Mid-day meal worker/asha worker/anganwari worker	0.00	0.91	0.52
(xv) Tailoring	0.69	1.79	0.95
(xvi) Auto/rickshaw pulling	0.63	3.08	5.34
(xvii) Labour in grain market	1.67	1.75	0.97
(xviii) Others*	1.08	0.25	0.00
Sub-total (2)	**67.31**	**75.84**	**72.16**
3. Transfer Income			
(i) Pensions	3.10	2.17	2.79
(ii) Scholarships	1.12	1.14	0.93
(iii) Help from relatives/friends	0.10	0.00	0.05
Sub-total (3)	**4.32**	**3.31**	**3.77**
Total (1+2+3)	**100.00**	**100.00**	**100.00**

Source: Computed from Table 1
*Note: *Others include income from tree cutting, cooking in functions, etc.*

In the case of other sources, a major proportion of the total income of the women labour households is earned from hiring out labour in construction work. The relative share of income from this source is the highest in Doaba (23.97 percent), followed by Majha (22.10 percent) and Malwa (18.93 percent). The second important source of income for an average woman labour household in Malwa is the income from hiring out labour under MGNREGA. The share of income from this source is 10.28 percent for Malwa. The corresponding percentages for Doaba and Majha are 6.16 and 5.22, respectively. During the field survey, it has been observed that the participation of female labourers is comparatively more than male labourers in the work under MGNREGA. This is because of the fact that work under MGNREGA is generally available within the native village and is light in nature. Moreover, women labourers are paid wages equal to men for their work under this scheme, unlike almost all other forms of work in the rural areas (Chandrasekhar and Ghosh, 2011). The next important source is the income in the form of salaries in the three regions. The share of income from this source is as high as 9.47 percent for Malwa, followed by 8.40 percent for Doaba and 7.94 percent for Majha. This is followed by income from self-employment, hiring out labour as domestic servants, white-washing, auto/rickshaw pulling, hiring out labour in brick-kiln work, working as drivers, livestock, vending vegetables/ fruits, dairying and labour in grain market in all the three regions. For an average woman labour household in all the three regions, a very small proportion of income, i.e., less than one percent is earned from piggery & poultry, remittances and mid-day meal worker/ asha worker/ anganwari worker.

An average woman labour household received 4.32, 3.77 and 3.31 percent of the total income in Malwa, Majha and Doaba, respectively, as transfer income. In this source, share of income in the form of pensions is more important in all the regions and the share of income from relatives/friends in the form of help is meager which indirectly indicates the poor economic condition of even relatives and friends.

3.2. Per Capita Income : Region-wise

Since the family size varies from region to region, it becomes relevant to compare the per capita income levels of the women labour households across the regions. Average family-size for Majha is the highest i.e., 4.83, followed by Malwa and Doaba, i.e., 4.58 and 4.53, respectively. Table 3 displays the annual per capita income for the women labour households in all the three regions. There are considerable variations in the per capita income levels across these regions. For example, the annual per capita income is the highest, i.e., Rs. 18178.65 in Doaba and the lowest, i.e., Rs. 15280.59 in Majha. For Malwa, it is Rs. 16755.03. This is on account of the fact that the average family size is the lowest in Doaba and the highest in Majha. Therefore, a negative relation between per capita income and family size emerges. Higher the family size reduces the per capita income and vice-versa. The level of household income for an average woman labour household is also higher for Doaba followed by Malwa and Majha.

The Table further shows that an average woman labour household earns a major part of its annual per capita income, i.e., Rs. 4753.29 and Rs. 3677.73 from hiring out labour (both on contractual as well as casual basis) in agriculture in Malwa and Majha, respectively. However, in Doaba, the annual per capita income is Rs. 3789.53 from this source of income which stands at the second rank. In this region, the first rank goes to the per capita income from hiring out labour in construction work, i.e., Rs. 4358.18. In Malwa and Majha, the second major source of income of women labour households is income from hiring out labour in construction work amounting to Rs.3172.36 and Rs. 3377.22, respectively. Besides this, rest of the income of the women labour households comes from salaries, hiring out labour under MGNREGA, self-employment, hiring out labour as domestic servants, white-washing, auto/ rickshaw pulling, hiring out labour in brick-kiln work, working as drivers, vending vegetables/ fruits, dairying, labour in grain market and tailoring in all the three regions. For an average woman labour household a very small amount of income is earned from piggery & poultry, remittances, mid-day meal worker/asha worker/anganwari worker and others in all the three regions.

TABLE 3 : PER CAPITA INCOME OF WOMEN LABOUR HOUSEHOLDS: REGION-WISE

(In Rs. Per Annum)

Source of Income	Malwa	Doaba	Majha
1. Income from hiring out labour in agriculture			
A. On contractual basis			
(i) Cash	687.53	135.71	399.76
(ii) Kind			
(a) Agricultural produce	39.06	10.18	20.17
(b) Meals	47.24	7.63	26.69
(c) Tea and milk	34.03	5.09	14.83
(d) Clothes and other commodities	12.31	2.54	5.93
B. On casual basis			
(i) Cash	3890.90	3585.92	3176.54
(ii) Kind			
(a) Agricultural produce	28.30	23.79	10.68
(b) Meals	0.00	0.00	0.00
(c) Tea and milk	8.03	15.27	13.94
(d) Clothes and other commodities	5.89	3.40	9.19

Source of Income	Malwa	Doaba	Majha
Sub-total (1)	**4753.29**	**3789.53**	**3677.73**
2. Income from other sources			
(i) Hiring out labour in construction work	3172.36	4358.18	3377.22
(ii) Hiring out labour in brick-kiln work	404.73	371.18	590.98
(iii) Hiring out labour as domestic servants			
(a) Cash	605.24	711.37	886.71
(b) Kind	236.91	194.91	188.91
(iv) Hiring out labour under MGNREGA	1723.19	1119.61	798.03
(v) Self-employment	959.67	1415.95	1073.90
(vi) Dairying	273.50	395.67	174.56
(vii) Piggery and poultry	8.03	5.94	3.37
(viii) Livestock	421.04	484.22	299.46
(ix) Salaries	1586.52	1526.89	1213.52
(x) Working as drivers	426.97	519.93	438.32
(xi) Vending vegetables/fruits	296.42	370.15	411.15
(xii) White-washing	482.08	828.67	381.67
(xiii) Remittances	0.00	71.25	0.00
(xiv) Mid-day meal worker/asha worker/anganwari worker	0.00	165.56	79.18
(xv) Tailoring	115.57	325.70	145.55
(xvi) Auto/rickshaw pulling	105.31	559.57	816.13
(xvii) Labour in grain market	279.82	318.06	148.05
(xviii) Others*	180.57	43.26	0.00
Sub-total (2)	**11277.93**	**13786.07**	**11026.71**
3. Transfer Income			
(i) Pensions	519.42	395.25	427.05
(ii) Scholarships	188.34	207.80	141.38
(iii) Help from relatives/friends	16.05	0.00	7.72
Sub-total (3)	**723.81**	**603.05**	**576.14**
Total (1+2+3)	**16755.03**	**18178.65**	**15280.59**

Source: Field Survey, 2016-17
*Note: *Others include income from tree cutting, cooking in functions, etc.*

Beside this, the women labour households, on an average, receive Rs. 723.81, Rs. 603.05 and Rs. 576.14 as transfer income in Malwa, Doaba and Majha, respectively. In this source, pensions are relatively more important in all the three regions of the state.

3.3. Distribution of Household Income: Region-wise

Table 4 presents the distribution of household income among the women labourers in all the three regions. The Table depicts that the bottom 50 percent of the women labour households account for 31.31 percent of the total household income in Malwa. The corresponding figures for Doaba and Majha are 34.27 and 35.52 percent, respectively. On the other hand, the top 20 percent of the women labour households claim 36.40, 32.92 and 31.78 percent in Malwa, Doaba, and Majha, respectively. This highlights the fact that disparities in the distribution of household income are relatively more in Malwa in comparison to the other regions. The Gini coefficient

is found to be the highest (0.2675) among the women labour households in Malwa and the lowest (0.2015) in Majha, indicating relatively worse and better patterns of distribution, respectively. The value of the Gini coefficient is 0.2260 for Doaba.

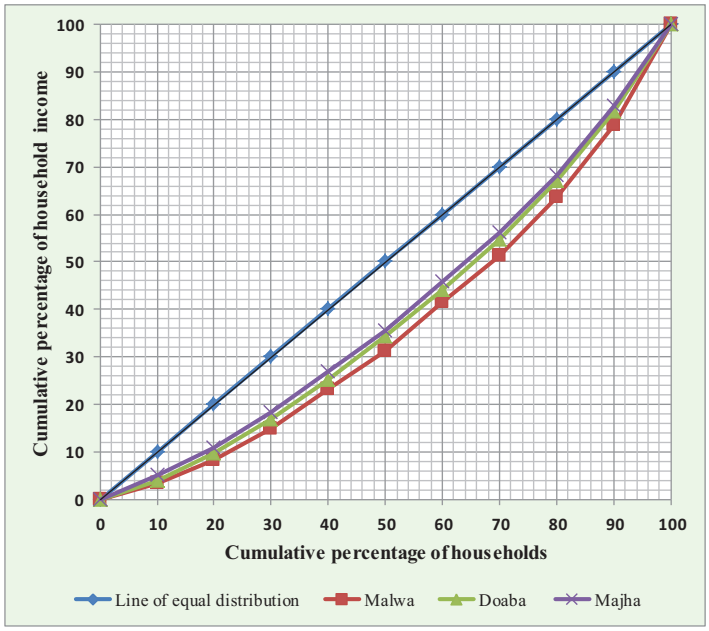
TABLE 4: DISTRIBUTION OF ANNUAL INCOME AMONG WOMEN LABOUR HOUSEHOLDS: REGION-WISE

Cumulative percentage of households	Cumulative percentage of household income of		
	Malwa	Doaba	Majha
10	3.34	3.85	4.92
20	8.20	9.55	10.83
30	14.93	16.71	18.29
40	23.04	25.07	26.84
50	31.31	34.27	35.52
60	41.63	44.02	45.72
70	51.27	54.84	56.20
80	63.60	67.08	68.22
90	78.92	81.62	82.73
100	100.00	100.00	100.00
Gini coefficient	0.2675	0.2260	0.2015

Source: Field Survey, 2016-17

Figure 2 shows that the distribution of household income among women labourers in Malwa is more unequal as the difference between the line of equal distribution and Lorenz curve of this region is the highest. On the other hand, the inequality in the distribution of household income among women labourers in Doaba is the lowest, having the least difference between the line of equal distribution and Lorenz curve of this region.

Figure 2: Concentration of Income among Women Labour Households: Region-wise



Note: Based on Table 4

3.4. Distribution of Per Capita Income: Region-wise

The distribution of per capita income among the women labour households in the three regions is given in Table 5. The Table reveals that there are relatively more disparities in the distribution of per capita income in comparison to those in the household income among the women labourers in all the three regions. The Table shows that the bottom 40 percent of persons claim only 20.58, 22.54 and 24.60 percent of total per capita income in Malwa, Doaba and Majha, respectively; while the top 10 percent appropriate 23.60, 21.65 and 19.82 percent of the total per capita income in Malwa, Doaba and Majha, respectively.

TABLE 5 : DISTRIBUTION OF PER CAPITA INCOME AMONG WOMEN LABOUR HOUSEHOLDS: REGION-WISE

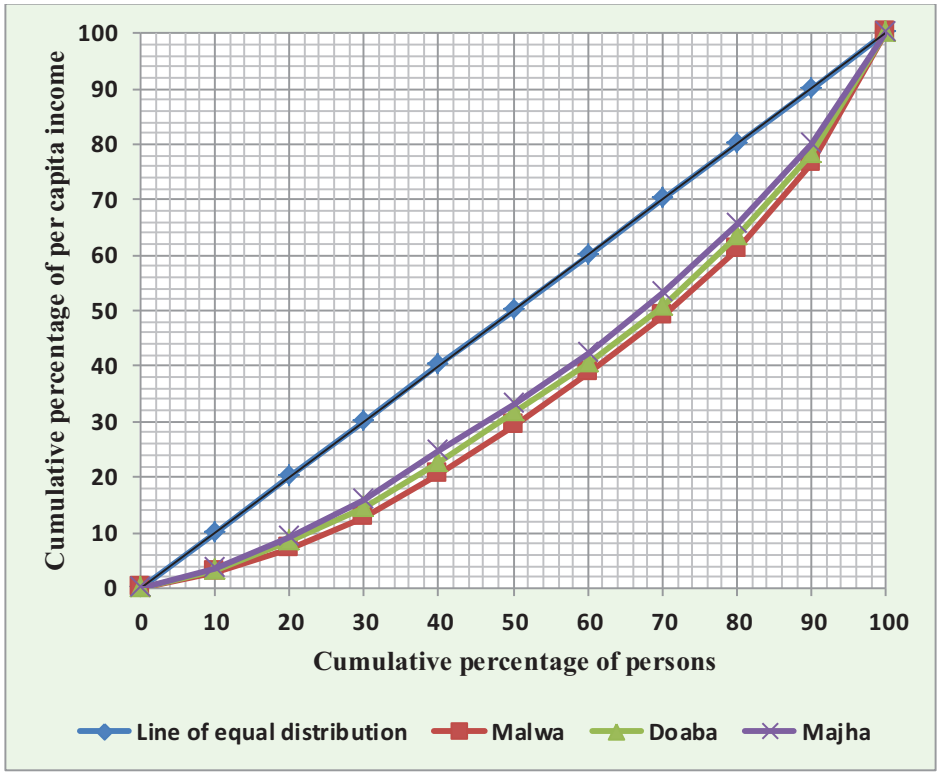
Cumulative percentage of persons	Cumulative percentage of household income of		
	Malwa	Doaba	Majha
10	2.89	3.11	3.50
20	7.15	8.25	9.13
30	12.74	14.44	15.88
40	20.58	22.54	24.60
50	29.32	31.62	33.16
60	38.89	40.38	42.37
70	48.83	50.87	53.10
80	60.97	63.39	65.51
90	76.40	78.35	80.18
100	100.00	100.00	100.00
Gini coefficient	0.3040	0.2741	0.2451

Source: Field Survey, 2016-17

The Gini coefficient is estimated to be the highest (0.3040) among the households in Malwa and the lowest (0.2451) in Majha revealing relatively worse and better patterns of distribution of the per capita income, respectively. The value of the Gini coefficient is 0.2451 for Doaba. When we compare the distribution of per household income and per capita income, we find that it is relatively fair in the case of per household income in all the three regions.

A glance at Figure 3 shows that the distribution of per capita income among the women labour households in Malwa is more unequal whereas it is relatively fair in Doaba.

Figure 3 : Concentration of Per Capita Income among Women Labour Households: Region-wise



Note: Based on Table 5

The comparison between distribution of per household income and per capita income shows that it is relatively fair in the case of per household income in all the three regions.

4. Conclusions

The foregoing analysis has clearly brought out that average annual income of the women labour households is the highest, i.e., Rs. 82433.18 in Doaba and the lowest, i.e., Rs. 73819.69 in Majha. It is Rs. 76752.84 in Malwa. The reason for the highest annual per household income in Doaba is that income from the other sources such as construction work, self-employment, white-washing, working as drivers, dairying, tailoring, and remittances is higher as compared to the other two regions. A major proportion of the income of the women labour households comes from hiring out (both contractual and casual) labour in agriculture in Malwa and Majha. During the field survey, it was observed that in Malwa especially in Mansa district, relatively more male members of the women labour households were contractual labourers in the agricultural sector as compared to the other two regions. However, this pattern is not noticed in Doaba. In Doaba, the major part of the total income comes from hiring out labour in construction work. However, income from agriculture is too low to meet the basic needs of the women labour households in all the three regions. This supports the fact that stagnation of agriculture has adversely affected the income pattern of rural labour class in all the regions. Therefore, the earning members of the women labour households are struggling hard to earn their income from other sources. For an average woman labour household, the annual per capita income is the highest in Doaba and the lowest in Majha. This is because of the reason that average family size is the lowest in Doaba and the highest in Majha. The comparison between distribution of per household and per capita income shows that it is relatively fair in the case of per household income in all the three regions.

4.1. Policy Implications

The results of the study and field survey have the following important implications:
First, the central and state governments must take strong initiatives for creating sufficient non-farm employment opportunities and should effectively implement the policies for improving the economic condition of the women labour households in the rural areas of Punjab.

Second, to reduce the seasonal unemployment, the government should effectively implement employment-oriented programmes, especially during the off-season.

Third, the agro-based small-scale industries should be established in the rural areas on priority basis.

Fourth, there is an urgent need to create awareness among the women labourers about the various employment programmes meant for them.

Fifth, the government should provide loans to the women labour households at a very low rate of interest for the establishment of various income generating ventures.

Sixth, quality education should be provided to the children of the women labourers so that they may get jobs in the non-agricultural sector also which may ultimately improve their economic condition.

Seventh, since the study has shown that the levels of household income and per capita income are higher in Doaba, this is because of fact that income from the non-agricultural sector is higher as compare to the other two regions. Therefore, the government should develop and establish such types of activities in the other two regions also.

Eighth, both the government and non-government organisations need to take the necessary steps to organise skill development programmes for the economic upliftment of women labourers.

Finally, the last, but the most important implication of the present study is based on the fact that a very large majority of the women labour households belong to the Scheduled Caste category. There is an urgent need of land reforms in the favour of the Scheduled Castes category which has been neglected since the ages.

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Economic Analysis of Plantation Crops – The Research on Cashew Nut Farming in Tamil Nadu

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Abstract

Cashew, a perennial dry fruit crop grown in laterite, red and coastal sandy soils of the tropical and subtropical tracts, is a native of South America. The total area under cashew in the world was 35.12 lakh hectares during 2009. The study is based on primary data collected during February, 2010. The top six villages were purposively selected for the study. In each of the selected villages, 10 cashew growers were randomly selected. In all the selected villages of Cuddalore and Ariyalur districts, cashew was raised as a dry crop. However, in Gandharvakkottai block of Pudukkottai district, cashew was cultivated as dry crop, while it was raised as an irrigated crop in Alangudy block of Pudukkottai district. Therefore, 30 dry cashew farms in Gandharvakkottai block and 30 irrigated cashew farms in Alangudy block were selected for the study. Thus, total 150 dry cashew farms and 30 irrigated cashew farms were selected. The average establishment cost of all farms was Rs. 17,878 and it was more in irrigated farms (Rs. 20,535) than that of the dry farms (Rs.17,177).The total cost of cultivation was more in irrigated farms (Rs. 21,538) than that of the dry farms (Rs. 18,022) and the average of all farms being Rs. 18,590. As the gross return and yield were more in irrigated farms, the cost of production per kg of raw cashew was lesser in irrigated farms (Rs.22.20) than that of the dry farms (Rs.24.69). The Mean Technical Efficiency (MTE) was 0.88 for total dry cashew farms; it was 0.99 for total irrigated farms; and 0.87 for overall farms. The Net Present Value was higher for irrigated farms (Rs. 80,027) than that of the dry farms (Rs. 57,911). In case of Benefit-Cost Ratio, irrigated farms had a higher ratio of 2.28 than that of the dry farms 2.03. Similarly, the Internal Rate of Return was also more for irrigated farms (42 percent) when compared to that of the dry farms (37 percent).

Key words: *Establishment cost, Maintenance cost, Frontier model and Financial feasibility analysis.*

Introduction

Cashew, a perennial dry fruit crop grown in laterite, red and coastal sandy soils of the tropical and subtropical tracts, is a native of South America. The Cashew, botanically known as Anacardium occidentale was introduced in India by the Portuguese in 16th century, primarily as a tree crop for preventing soil erosion, waste land development and helping afforestation.

The total area under cashew in the world was 35.12 lakh hectares during 2009. In terms of area under cultivation, India ranked first with 8.93 lakh hectares constituting about one – fourth of the area under cashew in the world, followed by Brazil (21.31 percent), Nigeria (10.69 percent), and so on (Table 1). India was ranked first in terms of cashew production also with 6.95 lakh tonnes and contributed slightly more than one – third of the global production of 20.13 lakh tonnes during 2009. The other major cashew producers were Vietnam with 3.09 lakh tonnes (15.33 percent of the cashew production in the world) followed by Nigeria producing 2.16 lakh tonnes (10.72 percent), Brazil with 1.89 lakh tonnes (9.40 percent) and so on.

The average cashew productivity across the countries during 2009 was 573 Kgs/ha. India ranked second in terms of cashew productivity with 778 Kgs/ha, next only to Vietnam (979 Kgs/ha). The productivity in Nigeria (575 kgs / ha) was closer to that of global average cashew productivity.

TABLE 1 : AREA, PRODUCTION AND PRODUCTIVITY OF CASHEW IN THE MAJOR CASHEW PRODUCING COUNTRIES DURING 2009

S. No.	Major Cashew Producing Countries	Area ('000 ha)	Production ('000 tonnes)	Productivity (Kgs/ha)
1.	India	893.29 (25.45)	695.09 (34.53)	778.12

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S. No.	Major Cashew Producing Countries	Area ('000 ha)	Production ('000 tonnes)	Productivity (Kgs/ha)
2.	Brazil	749.99 (21.31)	189.22 (9.40)	252.30
3.	Nigeria	375.22 (10.69)	215.80 (10.72)	575.11
4.	Indonesia	316.60 (9.02)	95.82 (4.76)	302.65
5.	Vietnam	315.20 (8.98)	308.60 (15.33)	979.04
6.	Guinea-Bissau	245.70 (7.00)	93.00 (4.62)	378.51
7.	Others	616.00 (17.55)	415.48 (20.64)	674.48
8.	World	3512.00 (100.00)	2013.00 (100.00)	573.18

Source: www.indiastat.com and crnindia.com

Figures in Parentheses indicate percentage to the total.

TABLE 2: AREA, PRODUCTION AND PRODUCTIVITY IN THE MAJOR CASHEW GROWING STATES IN INDIA DURING 1980-81 AND 2008-09

S. No	States	Area (' 000 ha)			Production (' 000 tonnes)			Productivity (Kgs/ha)		
		1980-81	2008-09	Percentage Change	1980-81	2008-09	Percentage Change	1980-81	2008-09	Percentage Change
1.	Andhra Pradesh	49.70 (10.70)	182.00 (20.38)	266.20	16.50 (8.90)	112.00 (16.12)	578.79	332.02	615.38	85.35
2.	Maharashtra	22.69 (4.89)	170.00 (19.04)	649.23	8.00 (4.32)	225.00 (32.38)	2712.50	352.55	1323.53	275.42
3.	Orissa	44.98 (9.68)	137.00 (15.34)	204.58	6.00 (3.24)	95.00 (13.67)	1483.33	133.38	693.43	419.89
4.	Tamil Nadu	94.77 (20.40)	131.00 (14.67)	38.23	11.00 (5.94)	68.00 (9.78)	518.18	116.07	519.08	347.21
5.	Karnataka	56.27 (12.12)	107.00 (11.98)	90.15	16.50 (8.90)	60.00 (8.63)	263.64	293.21	560.75	91.25
6.	Kerala	145.21 (31.26)	70.00 (7.84)	-51.79	117.00 (63.16)	75.00 (10.79)	-35.90	805.72	1071.43	32.98
7.	Goa	42.94 (9.25)	55.00 (6.16)	28.09	8.00 (4.32)	30.00 (4.32)	275.00	186.31	545.45	192.76
8.	West Bengal	6.70 (1.44)	11.00 (1.23)	64.18	2.00 (1.09)	11.00 (1.58)	450.00	298.60	1000.00	234.90
9.	Others	1.20 (0.26)	30.00 (3.36)	566.67	0.25 (0.13)	19.00 (2.73)	7500.00	207.99	633.33	204.50
10.	**India**	**464.46 (100.00)**	**893.00 (100.00)**	**92.27**	**185.25 (100.00)**	**695.00 (100.00)**	**275.17**	**398.85**	**778.28**	**95.13**

Figures in parentheses indicate percentages to the total.

Source: Indian Cashew Statistics, Cashew nut Export Promotion Council, Cochi

Maharashtra again ranked first in terms of cashew production also with 2.25 lakh tonnes constituting one – third of the total cashew production in India, followed by Andhra Pradesh (16 percent), Orissa (14 percent), Kerala (11 percent), Tamil Nadu (10 percent), and so on.

1.1. Cashew Economy of Tamil Nadu

Cashew is traditionally cultivated in Tamil Nadu for the past two centuries. Cashew occupied an area of 99,168 hectares with a production of 51,667 tonnes and yield of 521 kg/ha in Tamil Nadu in the year of 2008-09 (Season and Crop Report, 2008-09).

Among the different cashew growing districts in Tamil Nadu, Ariyalur (31.4 percent), Cuddalore (30.2 percent) and Pudukkottai (8.5 percent) were the major cashew growing districts accounting for about 70 percent of the total area. Cuddalore district ranked first in terms of cashew production with 24,302 tonnes (47.0 percent) and had the highest cashew productivity of 810 kg / ha among cashew growing districts in the state. Though Ariyalur district ranked first in area under cashew, it produced only 19 percent of total cashew production in Tamil Nadu and its productivity was lesser (315 Kgs / ha) than the state's average productivity of 521 Kgs / ha. Pudukkottai district occupied fourth place with 5.6 percent of total production with the productivity of 343 kg / ha (Season and Crop Report, 2008-09).

1.2. Research Problem

One of the serious constraints in increasing Indian cashew production is the low level of productivity. About forty percent of cashew area was under a senile category which led to low productivity levels. Even among the major cashew growing states, there were wide gaps in the productivity. The cashew productivity in Tamil Nadu (519 kg/ha) was much lower as compared to that of Maharashtra (1,324 kg/ha) and Kerala (1,071 kg/ha) (www.indiastat.com). The productivity levels in Tamil Nadu and Andhra Pradesh were far less than the national average of 760 kg / ha, which could be increased by employing proper planting materials and the latest farming technologies (Selvarajan, 1998).

The reasons identified by the research studies for the very low productivity were the use of seedlings propagated from seeds, poor adoption of improved planting materials (clone), low population density per unit area and adoption of poor agronomic practices (Selvaraj, 1999).

The specific objectives of the study are:

i) To analyze the nature and extent of growth in area, production, and productivity of cashew and instability in the production of cashew in Tamil Nadu and India;

ii) To analyze the economics and production efficiency of cashew farming in Tamil Nadu;

In the next stage, the revenue villages of the selected block were arranged in descending order according to their area under cashew and the top six villages were purposively selected for the study. In each of the selected villages, 10 cashew growers were randomly selected. In all the selected villages of Cuddalore and Ariyalur districts, cashew was raised as a dry crop. However, in Gandharvakkottai block of Pudukkottai district, cashew was cultivated as dry crop, while it was raised as an irrigated crop in Alangudy block of Pudukkottai district. Therefore, 30 dry cashew farms in Gandharvakkottai block and 30 irrigated cashew farms in Alangudy block were selected for the study. Thus, totally 150 dry cashew farms and 30 irrigated cashew farms were selected. The field survey was conducted during February, 2010.

The remainder of this paper is arranged as follows. Section 2 describes the tools of analysis. Section 3 discusses the results. Finally, Section 4 concludes the study with relevant policy implications.

2. Tools of Analysis

2.1. Costs and Returns of Cashew Plantations

2.1.1. Costs of Cultivation of Cashew

As cashew was maintained as a perennial crop, the total costs of cultivation were divided into (i) Establishment costs and (ii) Maintenance costs.

i) **Establishment Costs:** It was the cost incurred during the establishment of a cashew plantation. This cost comprised of land preparation / land clearing, digging of pits, planting material and its transportation, weeding, manures and fertilizers, plant protection chemicals and all other after care operations during the establishment period (upto three years from the date planting of the crop).

ii) **Maintenance Cost:** It includes all the costs incurred annually for the maintenance and production in the cashew plantation from the 3rd year onwards till the end of the life span of 35 years (productive year). It consisted of (a) annual fixed cost and (b) annual variable cost. The annual fixed cost included apportioned annual share of establishment cost, the rental value of land, land tax and cess, repairs, and maintenance of building and machines, depreciation and interest on fixed capital. The annual variable cost included the human labour cost, bullock labour cost, cost of machine power, material cost (plant protection chemicals, manures, and fertilizers, etc.), and interest on working capital.

2.2. Financial feasibility analysis

2.2.1. Net Present Value (NPV): This criterion was used to assess the present value of net accrued benefits over the economic life of the cashew plantations. It is the difference between the present value of the benefit stream and present value of cost stream. The general mathematical form of net present worth is:

$$NPV = \sum_{t=1}^{n} B_t / (1+i)_t - \sum_{t=1}^{n} C_t/(1+i)^t$$

where,

B_t= Benefit during t^{th} year; C_t = Cost during t^{th} year; and t= Time period.

The annual discount rate considered for the analysis was 12 percent and the project period considered was 10 years. If the NPV is positive, it indicates the financial viability of cashew farms.

2.2.2. *Benefit Cost Ratio (BCR):* It is the ratio between the discounted cash inflows and discounted cash outflows, and this ratio must be unity or more for an investment to be considered as financially viable. The BCR is obtained from the following formulae:

$$BCR = [\sum_{t=1}^{n} B_t / (1+i)^t] / [\sum_{t=1}^{n} C_t/(1+i)^t]$$

2.2.3. *Internal Rate of Return (IRR):* It is the rate of return, which equates the discounted benefits with the discounted costs. It represents the annual rate of return from cashew plantations. IRR is arrived through the interpolation technique by using different discount rates, so as to see that the net present worth is equated to zero. The formula is:

$$IRR = \left\{ \begin{array}{l} \text{Lower Discount Rate (at which the NPW is Positive)} \\ + \\ \text{Difference between the Lower and Higher Discount Rates} \\ \times \\ \dfrac{\text{Present Worth of Cash Flow at Lower Discount Rate.}}{\text{Absolute Difference Between the Present Worth's of the Cash Flow at the Lower and Higher Discount Rates (Signs Ignored)}} \end{array} \right\}$$

The IRR more than the discount rate or opportunity cost of capital is considered for promising economic feasibility and financial soundness of the project.

2.3. Frontier Production Function Analysis

In the present study, an attempt was made to measure the efficiency of production of irrigated and dry cashew crops using stochastic frontier production function. For the purpose, the Cobb – Douglas form of production function as discussed in the previous section was used. The stochastic frontier production function model is detailed below:

$$1nY_i = 1n\beta_0 + \beta_1 InX_{1i} + \beta_2 InX_{2i} + \beta_3 InX_{3i} + \beta_4 InX_{4i} + \beta_5 InX_{5i} + V_i - U_i$$

Where, ln denotes natural logarithms to the base e,

Y = Yield of cashew (kg of raw nuts / ha)

X_1 = Human labour (man days / ha)

X_2 = Manures and fertilizers used (Rs / ha)

X_3 = Plant protection chemicals (Rs/ha)

X_4 = Age of trees (years)

X_5 = Number of trees per ha.

V_i, U_i = Error term.

3. Results and Discussion

TABLE 3 : ESTABLISHMENT COST OF CASHEW PLANTATIONS (FIRST YEAR)

S. No.	Operations	Dry				Irrigated -Pudukkotta	Overall
		Cuddalore	Ariyalur	Pudukkottai	Total Dry		
1.	**Land Clearing**	2020 (23.60)	1994 (23.51)	1983 (23.56)	2002.20 (23.55)	2304 (22.22)	2052.50 (23.31)
2.	**Digging of Pits**	580 (6.78)	577 (6.80)	575 (6.83)	577.80 (6.80)	610 (5.88)	583.17 (6.62)
3.	**Seedling and Transportation**	720 (8.41)	718 (8.46)	738 (8.77)	722.80 (8.50)	820 (7.91)	739.00 (8.40)
4.	**Planting, Staking and Mulching**	810 (9.46)	806 (9.51)	802 (9.53)	806.80 (9.49)	785 (7.57)	795.17 (9.03)
5.	**Weeding**	920 (10.75)	917 (10.81)	906 (10.76)	916.00 (10.78)	1150 (11.09)	955.00 (10.85)
6.	**Manures and Fertilizers**	2755 (32.18)	2735 (32.24)	2700 (32.07)	2736.00 (32.19)	3600 (34.72)	2880.00 (32.71)
7.	**Plant Protection**	270 (3.15)	260 (3.07)	254 (3.02)	262.80 (3.09)	580 (5.60)	315.67 (3.59)
8.	**Irrigation Charges**	485 (5.67)	475 (5.60)	460 (5.46)	476.00 (5.60)	520 (5.01)	483.33 (5.49)
9.	**Total Cost**	**8560 (100.00)**	**8482 (100.00)**	**8418 (100.00)**	**8500.40 (100.00)**	**10369 (100.00)**	**8803.84 (100.00)**
10.	**Average No. of Trees per ha**	140	153	143	146	169	150
11.	**Cost per Tree**	61.14	55.43	58.87	58.22	61.36	58.69

Figures in parentheses indicate percentage to total.

The average establishment cost per ha in irrigated farms was more (Rs.10, 369) than that of dry farms (Rs.8, 500). The cost of manures and fertilizers constituted the highest share in the total establishment cost in irrigated farms (35 percent), which was followed by land clearing (22 percent), weeding (11 percent) and so on. The costs of manures and fertilizers, weeding and plant protection were more in irrigated farms than that of the dry farms and this led to the increase in the total establishment cost in irrigated farms than that of dry farms.

The average number of trees maintained in irrigated farms per ha was more (169) than that of the dry farms (146) and obviously, there existed more scope for increased cashew production in the former than that of the latter.

3.1. Costs and Returns of Cashew Plantations

The per hectare cost of cashew cultivation and returns for all the sample districts both under dry and irrigated farms were analyzed separately and the results are presented in Table 4. The establishment cost would include the cost incurred for the first three year period of the establishment of the crop.

It could be seen from Table 4 that the average establishment cost of all farms was Rs. 17,878 and it was more in irrigated farms (Rs. 20,535) than that of the dry farms (Rs.17,177). The average annual variable cost of cultivation of cashew in all the sample farms was more (67 percent of the total cost) than that of the annual fixed cost which accounted for 33 percent. The annual fixed, variable and total costs were more in irrigated than that of the dry

farms. However, the share of the annual variable cost to total cost was more for irrigated farms (69.5 percent) than that of the dry farms (66.1 percent). The total cost of cultivation was more in irrigated farms (Rs. 21,538) than that of the dry farms (Rs. 18,022) and the average of all farms being Rs. 18,590.

As discussed earlier, the cost of manures and fertilizers in all cashew farms accounted for a major share of 27.12 percent of total cost and it was followed by human labour (20.25 percent), plant protection chemicals (7.37 percent) and so on. It could be seen from Table 3 that the annual establishment cost per tree was more in irrigated farms (Rs.61.36) than that of dry farms (Rs.58.22).

It could be seen from Table 4 that the cost per tree was more in irrigated farms (Rs.127) than that of the dry farms (Rs.123). The yield of raw nuts per ha was more in irrigated farms (970 kgs) than that of the dry farms (730 kgs). The gross returns were also more in irrigated farms (Rs. 43650) than that of the dry farms (Rs. 33288). The net returns per ha had also shown the similar trend. As the gross return and yield were more in irrigated farms, the cost of production per kg of raw cashew was lesser in irrigated farms (Rs.22.20) than that of the dry farms (Rs.24.69).

TABLE 4 : COSTS AND RETURNS OF CASHEW PLANTATIONS IN THE SAMPLE HOUSEHOLDS

(Rs /HA)

S. No.	Particulars	Dry				Irrigated	Overall
		Cuddalore	Ariyalur	Pudukkottai	Total Dry	Pudukkottai	
A.	**Establishment Cost**	17364	17554	17008	17177	20535	17878
B.	**Annual Fixed Cost**						
1.	Annual Share of Establishment Cost	2124 (11.83)	2147 (12.14)	2080 (10.48)	2101 (11.65)	2512 (11.66)	2187 (11.77)
2.	Depreciation cost	325 (1.81)	304 (1.72)	312 (1.57)	314 (1.74)	540 (2.51)	351.67 (1.89)
3.	Interest on fixed capital	1200 (6.68)	1100 (6.22)	1740 (8.77)	1268 (7.04)	1080 (5.02)	1236.67 (6.65)
4.	Rental value of owned land	2250 (12.53)	2195 (12.41)	2645 (13.33)	2307 (12.80)	2320 (10.77)	2309.17 (12.42)
5.	Land cess	125 (0.69)	120 (0.68)	120 (0.60)	122 (0.68)	125 (0.58)	122.50 (0.66)
	Sub Total	6024 (33.55)	5866 (33.17)	6897 (34.75)	6112 (33.91)	6577 (30.54)	6207.01 (33.39)
C.	**Annual Variable Cost**						
1.	Human labour	3890 (21.67)	4216 (23.84)	3785 (19.07)	3820.20 (21.20)	3705 (17.20)	3765 (20.25)
2.	Bullock power	400 (2.23)	380 (2.15)	410 (2.07)	394 (2.19)	580 (2.69)	425 (2.29)
3.	Machine power	875 (4.87)	710 (4.02)	925 (4.66)	819 (4.54)	1250 (5.80)	890.83 (4.79)
4.	Manures and Fertilizers	4657 (25.94)	4524 (25.58)	5653 (28.49)	4803 (26.65)	6229 (28.92)	5040.67 (27.12)
5.	Plant protection chemicals	1359 (7.54)	1268 (7.17)	1465 (7.38)	1343.80 (7.46)	1497 (6.95)	1369.33 (7.37)
6.	Irrigation charges	-	-	-	-	740 (3.44)	123.33 (0.66)

S. No.	Particulars	Dry				Irrigated	Overall
		Cuddalore	Ariyalur	Pudukkottai	Total Dry	Pudukkottai	
7.	Interest on working capital	750 (4.18)	720 (4.07)	710 (3.58)	730 (4.05)	960 (4.46)	768.33 (4.13)
	Sub Total	**11931 (66.45)**	**11818 (66.83)**	**12948 (65.25)**	**11910 (66.09)**	**14961 (69.46)**	**12382.50 (66.61)**
D.	**Total Cost**	**17955 (100.00)**	**17684 (100.00)**	**19845 (100.00)**	**18022 (100.00)**	**21538 (100.00)**	**18589.50 (100.00)**
E.	Average no. of Plants per ha.	140	153	143	146	169	150
F.	**Cost per Tree**	128.25	115.58	138.78	123.44	127.44	123.93
G.	**Yield (Kgs / ha.)**	800	700	650	730	970	770
H.	**Price (per kg.)**	46.00	45.50	45.00	45.60	45.00	45.50
I.	**Gross income (Rs.)**	36800	31850	29250	33288	43650	35035
J.	**Net income (Rs.)**	18845	14166	9405	15266	22112	16445.5
K.	**Cost of Production (Rs./Kg)**	22.44	25.26	30.53	24.69	22.20	24.14

Source: Author's calculations

(Figures in parentheses indicates percentage to Cost)

3.2. Stochastic Frontier Production Function

Cobb-Douglas production function assumed that farmers are technically efficient and derive the maximum output from given level of inputs. The production function needed the assumption of constant returns to scale. These assumptions are unrealistic because of the utilization of inputs to their optimum level depends on the knowledge of farmer about chosen technology. Apart from this, OLS method shows only an average response and does not represent the frontier. Considering the above mentioned limitations, the Maximum Likelihood estimates of the stochastic frontier production function were made in order to estimate the technical efficiency of cashew plantations under dry, irrigated and overall situations and the results are presented in Table 5.

TABLE 5 : MAXIMUM LIKELIHOOD ESTIMATES OF STOCHASTIC FRONTIER PRODUCTION FUNCTION OF CASHEW IN THE STUDY AREA

Dependent variable: Cashew Yield Raw nuts (Kg / ha).

S. No	Variables	Maximum Likelihood Estimates		
		Total Dry	Irrigated	Overall
1.	Constant (β_o)	5.5862* (2.8944)	7.3089** (3.7599)	8.4223** (4.3261)
2.	Human labour (Man days) (β_1)	-0.0260* (0.0174)	0.0167** (0.0098)	-0.6509** (0.3461)
3.	Cost of Manures and fertilizers(Rs) (β_2)	0.2312* (0.1275)	0.0278* (0.0181)	-0.0032 (0.0019)
4.	Cost of Plant protection chemicals(Rs)(β_3)	0.0024** (0.0018)	-0.0263** (0.0144)	0.2465** (0.1242)

S. No	Variables	Maximum Likelihood Estimates		
		Total Dry	Irrigated	Overall
5.	Age of Trees(years)(β_4)	-0.0122 (0.0061)	0.0040 (0.0093)	-0.0837* (0.0203)
6.	Number of Trees per ha (β_5)	-0.0922 (0.5106)	0.0250 (0.0163)	0.4318** (0.2254)
7.	$\sigma^2 = \sigma^2_u + \sigma^2_v$ (Total variability)	0.0225	0.0001	0.0299
8.	$\sigma^2 u$ (Farmer variability)	0.0217	0.00007	0.0261
9.	σ^2_V (Random variability)	0.0008	0.00003	0.0038
10.	$\lambda = \sigma u / \sigma v$	5.1226	1.5289	2.9463
11.	$\gamma = \sigma^2 u / \sigma^2 u + \sigma^2 v$ (Variance ratio)	0.9631	0.7000	0.8742
12.	Log likelihood function	152.2718	103.6685	138.7752
13.	MTE= $1- \sigma_u (2/3.14)^{0.5}$	0.8825	0.9933	0.8711

Source: Author's own calculations.
*Figures in parentheses indicate standard errors. MTE refers to the Mean Technical Efficiency. **indicates significance at one percent level * indicates significance at five percent level.*

The variance of one sided error term (σ 2u) and symmetric error term (σ 2v) estimated for total dry cashew farms were 0.0217 and 0.0008; for irrigated cashew farms, the estimates were 0.00007 and 0.00003; and for the overall cashew farms, the estimates were 0.0261, 0.0038 respectively. The variance ratio parameter (γ) estimated for total dry, irrigated and overall farms were at 0.96, 0.70 and 0.87 which were closer to one. This implied that the deviation in the output from the frontier yield was mainly due to technical inefficiency.

The ratio of the one sided error term (u) to that of the symmetric error term (v) worked out for total dry, irrigated and overall cashew farms were 5.1226, 1.5289 and 2.9463 respectively. The ratio was higher in total dry cashew farms than that of the irrigated farms. Also, the ratio of more than one would depict that the technical inefficiency was more than that of the statistical error. Thus, it could be concluded that the technical inefficiency was more pronounced in dry farms than that of the irrigated farms.

The Mean Technical Efficiency (MTE) was 0.88 for total dry cashew farms; it was 0.99 for total irrigated farms; and 0.87 for overall farms. This implied that the technical efficiency of the irrigated cashew farmers was higher accounting for 99 percent than that of the dry farms (88 percent). This would further reveal that there existed better scope to increase the yield of cashew to the extent of 12 percent in dry cashew farms and one percent in irrigated cashew farms through the use of the technically efficient plan. So, there still existed a scope to increase the production of cashew without an increase in the cost of production through the application of more quantity of inputs. This would reflect the need to disseminate the available technologies from progressive to average farmers.

Also as discussed under age of the trees in this chapter, it was observed that nearly one fourth of trees were old in dry cashew farms (i.e., more than 20 years) and facing felling stage. Hence, replacing these old trees would also increase the yield and production efficiency of those farms.

3.3. Financial Viability of Cashew Plantations

In order to evaluate the financial viability of cashew plantations, the project evaluation criteria such as Net Present Value (NPV), Benefit-Cost Ratio (BCR) and Internal Rate of Return (IRR) were employed. The average age of cashew in Cuddalore, Ariyalur, dry cashew farms of Pudukottai districts were found to be 25 to 35 years and in irrigated farms of Pudukottai district, most of the hybrids were maintained for a period of 12 to 19 years. In general, the cashew yield was picking up from fourth year, stabilizing from ninth year onwards and the

crop was maintained for a maximum period of 35 years. However, the project period considered for evaluating the financial viability of cashew plantation was 10 years and the discount rate used for estimating NPV and BCR was 12 percent per annum. The results of the financial viability analyses for cashew dry, irrigated and overall situations are presented in Table 6.

TABLE 6 : FINANCIAL VIABILITY OF CASHEW PLANTATIONS IN THE STUDY AREA

S. No.	Project Evaluation Technique	Cashew -Dry	Cashew- Irrigated	Cashew- Overall
1.	Net Present Value(NPV)(Rs) @ 12% dr	57,911	80,027	61,116
2.	Benefit Cost Ratio (BCR) @12%dr	2.03	2.28	2.06
3.	Internal Rate of Return (IRR) (%)	37.44	42.05	38.06

It could be seen from the table that the Net Present Value was higher for irrigated farms (Rs. 80,027) than that of the dry farms (Rs. 57,911). In case of Benefit Cost Ratio, irrigated farms had higher ratio of 2.28 than that of the dry farms 2.03. Similarly, the Internal Rate of Return was also more for irrigated farms (42 percent) when compared to that of the dry farms (37 percent). This would highlight that the cashew plantation would be a financially worthwhile venture in the study area and there is a vast potential for taking up the cultivation of high yielding varieties of cashew plantation, especially in the irrigated conditions of Pudukottai district of Tamil Nadu.

4. Conclusions

First, the total cost of establishment of one ha cashew nut farm was estimated to be Rs.18, 589.50. The variable cost was more, i.e., 67 percent of the total cost and remaining 33 percent was accounted by fixed cost.

Second, the maintenance cost of one ha of cashew farms was worked out to be Rs.4294.50 in the second year and increased to Rs.7175.17 in the ninth year and manuring and fertilizer application accounted for the major share.

Third, the cost of production of one kg of raw cashew nut was estimated to be Rs.24.14. However, the output price was higher at Rs.45.50 per kg of raw cashew nut.

Fourth, the total gross income and total cost expenditure per ha of cashew nut were estimated to be Rs.35,035 and Rs.16,072.50 respectively and the total net income per ha cashew nut was worked out to be Rs.18,962.50.

Fifth, the average farm income per ha from all sources put together for all cashew farms was Rs. 43,023. In all cashew farms, income from crop accounting for 92.01 percent and it was followed by income from livestock (3.91 percent), non-farm (3.20 percent) and off-farm (0.88 percent) activities.

Sixth, the yield per ha of cashew nut was found more for irrigated cashew farmers (970Kg/ ha) when compared with that of total dry farmers (730 Kg / ha). The share of income generated from cashew nut to the total farm income was more for irrigated cashew farmers (83.34 percent) than that of dry cashew farms (79.95 percent), which revealed the very high dependence of the sample farmers on cashew for their livelihood.

Seventh, the financial viability analysis of cashew farms indicated that the irrigated farms were financially viable, i.e., the benefit cost ratio, net present value, internal rate of return for irrigated farms was higher (2.28, Rs.80027, 42.05 percent respectively) than that of dry cashew farms.

Eighth, the Mean Technical Efficiency of overall farmers was only 87.11 percent which indicated that the yield of cashew nut could still be increased by 12.99 percent through the adoption of technical efficient plan like extension agency contact etc. The allocative efficiency was calculated to be 93 percent.

4.1. Policy Implications

The policy suggestions that emanated from the conclusions of the present study are listed below:

1) The study revealed that the total establishment cost per ha of cashew farm was Rs.17, 878 for a period of 3 years. So, intercropping with suitable intercrops would be an additional source of income in the first - two years and this would also boost the growth of cashew trees and also generate additional employment for

the farmers. Therefore, extension efforts with adequate backward and forward linkages for introducing an intercrop may be strengthened.

2) Since the ratio between Value Marginal Product (VMP) and prices of plant protection chemicals was more than one, the addition of these inputs proved profitable in the present situation. However, the manures and fertilizers were over utilized in the farms. So, dosage of manures and fertilizers should be properly followed in the farms based on soil and leaf analyses with the help of Cashew Development Council and Cashew Research Stations.

3) The Cashew Producer's Societies (CPS) should be started with collection centres wherever they are required so that the farmers could become members and market their produce in the form of raw nuts / kernels. This system of large scale processing of raw nuts/kernels by CPS will also help to produce higher grade cashew nut kernels with uniform quality and reduce the cost of processing.

4) The optimum plant population, replacing old aged plants with high yielding varieties, proper agronomic practices, especially in staking and mulching and timely application of inputs, proper and timely usage of extension agent contact should be followed so that farmers can reach the frontier yield and reduce the cost of production. The evolution of high yielding varieties in cashew nut, supported with adequate extension network for popularizing the modern production techniques would help farmers in enhancing the cashew nut productivity.

5) As the level of domestic raw cashew production had positively influenced the export of cashew, cashew growers should be provided with more price incentives and supported with adequate storage and processing infrastructure so as to boost the cashew exports.

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Agro-Economic Research

Impact of Soil Health Card Scheme on Production, Productivity and Soil Health in Maharashtra*

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Soil test based application of fertiliser is extremely important for increasing efficiency of usage and increasing the crop yield. The centrally sponsored Soil Health Card Scheme (SHCS) was launched in February 2015 with a view to providing soil health cards (SHCs) periodically to the farmers. An SHC reports test values of various parameters, such as micro and macro nutrients, organic carbon and soil pH, depending upon these values, soil is rated and recommendations relating to the application of nitrogen (N), Phosphorous (P) and Potash (K) are given for various crops. The application of recommended doses of fertiliser (RDF), therefore, is expected to improve health and productivity of the soil.

Maharashtra is one of the economically leading states of India. However, as per 2011census, still about 52.71 percent of the workforce is engaged in this sector which contributes merely around 8 percent to the state domestic product indicating lower productivity of the state soil. In addition to this, various factors such as increasing input costs, poor irrigation facilities, marginalization of landholdings, weak supply chains have been constraining the performance of the agricultural sector of the state and the farmers are unable to obtain satisfactory income.

In view of this, implementation of the SHCS is expected to reveal soil deficiencies in the state and improve nutrient application thereby increasing the capacity of the soil to increase crop yield. This study therefore focuses on implementation as well as the adoption of SHCS in Maharashtra.

Objectives and Scope of the Study

The major objectives of the study are as follows:

1) To document the status and implementation of Soil Health Card Scheme in Maharashtra.
2) To analyze the impact of adoption of soil testing technology and recommended doses of fertilizers on the basis of Soil Health Cards on crop production, productivity and soil health in Maharashtra.

Data and Methodology

The study is based on secondary as well as primary data collected from the field.
Secondary data relating to the status and implementation of the scheme was collected from the office of the Commissioner of Agriculture, Government of Maharashtra, Pune. Two districts, based on the implementation status of the scheme, were selected. Based on the discussions with the state level officials, district Sangli from western Maharashtra region and district Osmanabad form central Maharashtra (Marathwada region) were selected.

From each of the districts, two taluks/tehsils were selected. From each of the selected talukas, two villages were selected. In one of these two, testing of soil had been over and cards were distributed at the beginning of rabi season of 2015-16. Therefore, soil tested farmers were selected randomly from this village.

The another village was a village where soil testing was yet to be conducted. Therefore, control farmers were selected randomly from this village.

From each of the talukas a sample of 15 soils tested farmers (STFs) and 15 control farmers (CFs) were selected. Thus, in all, 60 farmers per district and a total of 120 farmers for the state as a whole were selected.

Since the scheme is not specific to any crops, data was collected for three major crops of each of the sample farmers for analyzing implementation status of SHCS. While selecting the households, care was taken to have a representation of the farmers

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belonging to different farm size groups based on operational land holdings. The reference period for the study was Rabi 2015-16 as soil health cards were distributed in the state during the Rabi season.

Major Findings of the Study

Major Findings arising from the analysis of the secondary data are as follows:

I) The official data on the distribution of SHCs shows that during 2015-16, more than 39 lakh SHCs were issued, and more than 81 lakh SHCs were issued to the farmers at the state level during 2015-2016 and during 2016-2017. This constitutes 85 percent and 89 percent of the target set for distribution.

II) The classification of districts according to the combined (for the two years) percentage of SHCs issued shows that in Raigad, the progress was less than 50 percent. In all, in 10 districts, the progress was below 80 percent. In majority districts, i.e., 24 districts, the progress was more than 80 percent and in 9 districts; the targets were overachieved (more than 100 percent).

III) The districts wherein targets have been overachieved were from Nasik and Kolhapur divisions.

IV) The data shows that in a number of districts, the targets were not met, suggesting need for strengthening the distribution machinery.

Major Findings arising from the analysis of the primary data are as follows:

I) Socio-economic Characteristics of sample households of both the categories of farmers had similar demographic characteristics. Average years of age were 47.3 and that of education was 9 years. Overall, around 98 percent of the respondents were male. The social composition of the households showed that most of the households (86 percent) belonged to the 'general' category of farmers.

II) Agriculture was the main occupation for all the sample households. The average area of land owned was 6.2 acres and the net operated area was 5.8 acres. The size of land owned was larger (7.1 as compared to 5.4 acres) in case of STFs. The net operated area was also larger (6.2 acres as compared to 5.2 acres) in case of STFs.

III) The proportion of irrigated land was around 53 percent for both the categories of farmers indicating that 46 percent of the total land is unirrigated. Overall, major sources of irrigation were dug well (47.5 percent) as well as bore well (55 percent).

IV) The cropping pattern of both the categories of farmers was broadly similar. The major kharif crops were jowar and soybean that occupied almost 75 percent of the total kharif area of total sample households. Gram, rabi, jowar and wheat were the major rabi crops occupying around 90 percent of the rabi area of the sample farmers. Sugarcane and horticultural crops were important perennial crops of the sample households. However, for CFs, sugarcane was the most important crop and for STFs, along with sugarcane, horticultural crops were also important.

Gross Income by Agricultural Production

V) Though yield and income of STFs were higher than that of CGFs, the differences were not very high. Similarly, these differences could also be explained in terms of differences in the prices of inputs and products.

Awareness on SHC Scheme

VI) In relative terms, the STFs were more aware than the CFs about Integrated Nutrient Management, Soil Health Mission, and Soil Health Card Scheme. Ninety eight percent of the STFs were aware about SHCs as they were the beneficiaries of SHCs.

VII) However, only around 55 percent of the STFs were aware about Integrated Nutrient Management and imbalanced application of fertiliser.

VIII) Only 4 (6.7 percent of the) STFs had attended training programmes of any type. Adoption of Recommended Doses of Fertilizers on Soil Test Basis Analysis of the data revealed gaps between the actually applied quantity of various fertiliser and the recommended doses of fertiliser (RDF) which were based on the soil test results for the sample crops.

IX) For gram in case of majority of the fertiliser, applied doses were greater than the RDF. For the other two crops namely, wheat and gram, however, applied doses were less than the RDFs. Among various organic fertiliser, the farmers applied only Farm Yard Manure (FYM) for all the three major crops. The per acre expenditure of the farmers on FYM ranged between Rs.5800 and Rs. 6888.

Problems Encountered during Implementation of the Scheme

X) Out of a total of 60 STFs, only 39 farmers responded to the question relating to problems encountered during implementation. Thirty five percent of the farmers reported that they did not face any problem. It appeared that they were unable to report any problem probably because their awareness of the scheme was very low.

XI) Seventeen percent of those who replied felt that they did not have proper information about SHCS. Eighteen percent of the farmers felt that they had a problem in understanding/ reading information given on the SHCs. This indicated that farmers could not understand and accordingly apply the RDF. It was revealed that the farmers had difficulty in converting the recommended doses of NPK into application in terms of quantities of simple and complex fertiliser available in the market.

XII) Thirteen percent of the farmers said that soil sample was not collected from each farmers' land which indicated that farmers were not made aware about the scheme and the grid method of soil sample collection. As a result of this method of soil sample selection, in case of many farmers, soil sample was not taken and SHCs were directly distributed. This method could not ensure dissemination of information about the scheme as well as the cards as this did not lead to the interaction of the farmers with the government officials about the scheme as well as the SHC.

XIII) Five percent of the farmers reported that the farmers did not use RDF not only because of low level of awareness about the scheme/ card but also because it was also dependent on various factors such as availability of water, economic status of the farmers, etc.

XIV) Twelve percent of the farmers reported that they did not get SHC reports in time, i.e., before the sowing season and as a result, the basal dose could not be given as per the RDF. Overall, the analysis of the secondary as well as primary data collected from the field revealed that a lot of importance was given to completion of targets relating to sample collection, testing, printing and distributing cards. However, this did not lead to the creation of awareness about SHCS and SHCs. As a result, this probably led to mere distribution of cards.

Suggestions given by the Farmers regarding Implementation of SHCS.

XV) Various suggestion given about improving SHCS are as follows

1) As 35 percent of the farmers did not report any problem, they did not have any suggestion to offer.

2) Out of the remaining farmers, 32 percent suggested that there was a need for creating awareness about the scheme and usage of SHCs.

3) Eight percent of the farmers suggested that all farmers should apply the RDF which would have a positive impact on crop production.

4) As farmers were not aware of the grid system, 13 percent of the farmers felt that soil sample should be collected from each farmer's land.

5) Twelve percent of the farmers suggested that the SHCs should be distributed on time.

Impact of Application of RDF

6) Majority of those who responded felt that increase in crop yield (more than 90 percent of the farmers) and improvement in crop growth (more than 70 percent of the farmers) were the most important visible change after application of RDF.

7) Majority of the farmers felt probably did there was no visible change in incidence of pests and diseases in response to costs of inputs. Again, as was observed from the data, for all the crops,

the applied quantity of fertiliser was either less or more than the RDF.

8) Perhaps the visible changes in the yield and other parameters could have been important for more number of farmers if the farmers had followed the application norms (RDF).

Impact on Cost of Cultivation after Soil Testing

9) The before and after figures of the quantities applied for the inputs show that in case of some inputs there was a decline and in case of some other inputs there was an increase after soil testing. However, the changes were marginal in case of all the three crops. It was observed that the increase in net income for all the crops was mainly explained by changes in the input and output prices as differences in yield appeared to be marginal.

10) For comparing the extent of increase in gross income as well as total cost for each crop, Benefit Cost Ratio (BCR) was calculated for both the time periods- before and after soil testing. It was observed that for all the three crops, the BC ratio was higher after soil testing was done as compared to the earlier period.

11) BC ratio was also found for the difference in values of gross income and total cost in the two time periods. This shows the extent to which the incremental income is higher than the incremental costs. The BC ratio of the difference was 4.86, 3.68 and 1.92 for jowar, gram and wheat, respectively. As is mentioned above, the increase in income is mainly explained by changes in the input and output prices as differences in yield appeared to be marginal. The difference in terms of percentage change was found. It is observed that the net income increased by more than 50 percent for jowar and wheat and by around 22 percent in case of gram. However, as was already observed, the increase was mainly on account of increase in product prices and cannot perhaps be attributed to increase in the yield of the crop. Thus, there may not be direct relationship between improvement in soil health due to soil testing and yield level of the concerned crop after soil testing.

Policy Suggestions

Based on the analysis of the data, following policy implications emerge:

i) Efforts should be made to create awareness about of Soil Health Card Scheme, the grid system of soil sample collection, Soil Health Cards and Integrated Nutrient Management and their importance among all farmers. The focus should be on interpretation of soil health card and on conversion of recommended doses of nutrients into doses of fertiliser to be applied.

ii) Farmers should be compulsorily given training about the application of various fertiliser before the beginning of the season and during the season so that the recommendations about doses based on changing climatic conditions and availability of water can be given.

iii) The analysis of the data revealed that the actual applied doses of fertilizers were not equal to recommended doses. Similarly, the difference in yield and income before and after soil testing was not very large. Therefore, it is felt that there should be interaction among the farmers and the officials at regular intervals for the dissemination of information about recommended doses of nutrients and their importance in increasing yields of the crops. Soil Health Cards should be distributed in time before the season starts so that the farmers have recommendations about basal doses also.

COMMODITY REVIEWS

Foodgrains

During the month of May, 2018, the Wholesale Price Index (Base 2011-12=100) of Cereals and foodgrains increased by 0.55 percent and 0.28 percent, respectively, whereas the prices of pulses decreased by (-) 0.83 percent compared to April, 2018 .

ALL INDIA INDEX NUMBER OF WHOLESALE PRICES

(Base Year 2011-2012=100)

Commodity	Weight (%)	WPI for the Month of May, 2018	WPI for the Month of April 2018	WPI A year ago	Percentage change during	
					A month	A year
1	2	3	4	5	6	7
Paddy	1.43	154.2	153.3	148.0	0.59	4.19
Wheat	1.028	141.7	140.9	137.5	0.57	3.05
Jowar	0.067	117.0	118.0	130.5	-0.85	-10.34
Bajra	0.086	128.1	127.0	153.2	0.87	-16.38
Maize	0.189	117.8	118.0	134.2	-0.17	-12.22
Barley	0.014	139.8	138.9	137.7	0.65	1.53
Ragi	0.007	211.2	213.5	145.0	-1.08	45.66
Cereals	2.824	145.6	144.8	143.2	0.55	1.68
Pulses	0.639	119.8	120.8	151.9	-0.83	-21.13
Foodgrains	3.465	140.8	140.4	144.8	0.28	-2.76

Source: Office of the Economic Adviser, DIPP.

The following Table indicates the State-wise trend of Wholesale Prices of Cereals during the month of May, 2018.

Commodity	Main Trend	Rising	Falling	Mixed	Steady
Rice	Steady	Uttar Pradesh	Kerala		Jharkhand
			Gujarat		West Bengal
					Karnataka
Wheat	Rising	Madhya Pradesh	West Bengal		Jharkhand
		Gujarat	Maharastra		
		Uttar Pradesh			
		Rajasthan			
Jowar	Rising			Karnataka	Madhya Pradesh
		Maharashtra		Uttar Pradesh	

Commodity	Main Trend	Rising	Falling	Mixed	Steady
		Gujarat			
		Rajasthan			
Bajra	Falling	Gujarat	Uttar Pradesh		Karnataka
			Rajasthan		Maharashtra
Maize	Rising	Rajasthan	Jharkhand		Gujarat
		Madhya Pradesh	Karnataka		
		Uttar Pradesh			

Procurement of Rice

2.88 million tonnes of Rice (including paddy converted into rice) was procured during may, 2018 as against 3.01 million tonnes of Rice (including paddy converted into rice) procured during may, 2017. The total procurement of rice in the current marketing season, i.e., 2017-2018 up to 31.05.2018 stood at 35.30 million tonnes, as against 36.67 million tonnes of rice procured during the corresponding period of last year. The details are given in the following Table:

PROCUREMENT OF RICE

(In Thousand Tonnes)

State	Marketing Season 2017-18 (upto 31.05.2018)		Corresponding Period of last Year 2016-17		Marketing Year (October-September) 2016-17		2015-16	
	Procurement	Percent to Total	Procurement	Percent to Total	Procurement	Percent to Total	Procurement	Percent to Total
1	2	3	4	5	6	7	8	9
Andhra Pradesh	3674	10.41	3564	9.69	3725	9.78	4326	12.65
Chhatisgarh	3206	9.08	4022	10.94	4022	10.56	3442	10.06
Haryana	3991	11.30	3569	9.71	3583	9.40	2861	8.36
Maharashtra	165	0.47	257	0.70	309	0.82	230	0.67
Punjab	11832	33.51	11052	30.06	11052	29.00	9350	27.33
Tamil Nadu	777	2.20	141	0.38	144	0.38	1191	3.48
Uttar Pradesh	2874	8.14	2354	6.40	2354	6.18	2910	8.50
Uttarakhand	38	0.11	705	1.92	706	1.85	598	1.75
Others	8747	24.78	11107	30.21	12210	32.04	9301	27.19
Total	35304	100.00	36771	100.00	38105	100.00	34209	100.00

Source: Department of Food & Public Distribution.

Procurement of Wheat

The total procurement of wheat in the current marketing season, i.e., 2018-2019 up to 31-05-2018 is 34.17 million tonnes against 29.79 million tonnes of wheat procured during the corresponding period of last year. The details are given in the following Table :

PROCUREMENT OF WHEAT

(In Thousand Tonnes)

State	Marketing Season 2018-19 (upto 31.05.2018)		Corresponding Period of last Year 2017-18		Marketing Year (April-March) 2017-18		2016-17	
	Procurement	Percent to Total	Procurement	Percent to Total	Procurement	Percent to Total	Procurement	Percent to Total
1	2	3	4	5	6	7	8	9
Haryana	8739	25.57	7432	21.75	7432	24.11	6722	29.32
Madhya Pradesh	7281	21.31	6724	19.68	6725	21.82	3990	17.40
Punjab	12685	37.12	11688	34.20	11706	37.98	10645	46.42
Rajasthan	1484	4.34	1131	3.31	1245	4.04	762	3.32
Uttar Pradesh	3837	11.23	2799	8.19	3699	12.00	802	3.50
Others	149	0.44	18	0.05	18	0.06	9	0.04
Total	34175	100.00	29792	100.00	30825	100.00	22930	100.00

Source: Department of Food & Public Distribution.

Commercial Crops

Oilseeds

The Wholesale Price Index (WPI) of nine major oilseeds as a group stood at 137.7 in May, 2018 showing a decrease of 0.5% and an increase of 8.08% over the previous month and year, respectively. The WPI of copra (coconut) increased by 5.02% over the previous month. The WPI of groundnut seed decreased by 1.9%, rape & mustard seed by 0.07%, cotton seed by 0.37%, gingelly seed (sesamum) by 1.01%, niger seed by 9.3%, safflower (kardi seed) by 2.32%, sunflower by 7.74% and soyabean by 1.02% over the previous month.

Manufacture of Vegetable and Animal oils and Fats

The WPI of manufacture of vegetable and animal oils and fats as a group stood at 120 in May, 2018 showing an increase of 1.01% and 13.21% over the previous month and year, respectively. The WPI of mustard oil decreased by 0.48%, rapeseed oil by 0.64%, copra oil by 4.30% over the previous month. The WPI of cottonseed oil decreased by 0.09% over the previous month.

Fruits & Vegetable

The WPI of fruits & vegetable as a group stood at 140.4 in May, 2018 showing a decrease of 1.54% and increase of 8.75% over the previous month and year, respectively.

Potato

The WPI of potato stood at 198.3 in May, 2018 showing an increase of 18.67% over the previous month and an increase of 81.93% over the previous year.

Onion

The WPI of onion stood at 115.8 in May, 2018 showing a decrease of 5.55% and an increase of 13.20% over the previous month and year, respectively.

Condiments & Spices

The WPI of condiments & spices (group) stood at 127.1 in May, 2018 showing a decrease of 0.24% over the previous month and an increase of 4.52% over the year. The WPI of black pepper decreased by 0.07%, chillies (dry) increased by 0.56% and turmeric increased by 1.80% over the previous month.

Raw Cotton

The WPI of raw cotton stood at 105 in May, 2018 showing an increase of 2.04% over the previous month and a decrease of 4.02 % over the year.

Raw Jute

The WPI of raw jute stood at 166.3 in May, 2018 showing an increase of 0.36% and an increase of 1.71% over the previous month and year, respectively.

WHOLESALE PRICE INDEX OF COMMERCIAL CROPS

(Base Year : 2011-12=100)

Commodity	May, 2018	April, 2018	May, 2017	% Variation over the Month	% Variation over the Year
Oilseeds	137.7	138.4	127.4	-0.5	8.08
Groundnut Seed	107.5	109.6	136.2	-1.9	-21.07
Rape & Mustard Seed	136.7	136.8	230.7	-0.07	4.59
Cotton Seed	133.9	134.4	148.1	-0.37	-9.59
Copra (Coconut)	226.1	215.3	132.1	5.02	71.16
Gingelly Seed (Sesamum)	126.8	128.1	116.3	-1.01	9.03
Niger Seed	153.7	169.5	204.7	-9.32	-24.91
Safflower (Kardi Seed)	134.6	137.8	127.8	-2.32	5.32
Sunflower	98.9	107.2	102.6	-7.74	-3.61
Soyabean	155.9	157.5	123.4	-1.02	26.34
Manufacture of vegetable and animal oils and fats	120.0	118.8	106.0	1.01	13.21
Mustard Oil	120.7	119.3	117.9	1.17	2.37
Soyabean Oil	114.6	114.3	102.6	0.26	11.70
Sunflower Oil	108.2	106.9	101.8	1.22	6.29
Groundnut Oil	103.8	103.3	117.5	0.48	-11.66
Rapeseed Oil	110.5	109.8	111.4	0.64	-0.81
Copra Oil	184.5	176.9	142.6	4.30	29.38
Cotton Seed Oil	110.2	110.3	96.7	-0.09	13.96
Fruits & Vegetables	140.4	142.6	129.1	-1.54	8.75
Potato	198.3	167.1	109.0	18.67	81.93
Onion	115.8	122.6	102.3	-5.55	13.20
Condiments & Spices	127.1	127.4	121.6	-0.24	4.52
Black Pepper	139.8	139.9	167.4	-0.07	-16.49
Chillies (Dry)	125.8	125.1	101.8	0.56	23.58
Turmeric	124.6	122.4	107.0	1.80	16.45
Raw Cotton	105.0	102.2	109.4	2.04	-4.02
Raw Jute	166.3	165.7	163.5	0.36	1.71

Statistical Tables
Wages

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

(In Rs.)

State	District	Centre	Moth & Year	Daily Normal Working Hours	Field Labour		Other Agri. Labour		Herdsman		Skilled Labour		
											Carpenter	Black Smith	Cobbler
					M	W	M	W	M	W	M	M	M
Andhra Pradesh	Krishna	Ghantasala	Nov, 17	8	350	300	400	NA	250	NA	NA	NA	NA
	Guntur	Tadikonda	Nov, 17	8	305	275	325	NA	275	NA	NA	NA	NA
Telangana	Ranga Reddy	Arutala	Jan,18	8	600	258	435	NA	NA	NA	450	500	NA
Karnataka	Bangalore	Harisandra	Sep, 17	8	360	340	400	350	400	300	600	450	NA
	Tumkur	Gidlahali	Sep,17	8	250	200	250	200	250	NA	300	280	NA
Maharashtra	Bhandara	Adyal	Oct, 17	8	200	150	250	150	200	150	350	250	200
	Chandrapur	Ballarpur	March, 18	8	300	150	300	150	200	NA	250	200	150
Jharkhand	Ranchi	Gaitalsood	Nov, 17	8	230	230	230	230	230	230	317	317	NA

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

(In Rs.)

State	District	Centre	Month & Year	Type of Labour	Normal Daily WorkingHours	Ploughing	Sowing	Weeding	Harvesting	Other Agri Labour	Herdsman	Skilled Labours		
												Carpenter	Black Smith	Cobbler
Assam	Barpeta	Laharapara	Apr, 17	M	8	250	250	250	250	250	250	350	250	350
				W	8	NA	NA	200	200	200	NA	NA	NA	NA
Bihar	Muzaffarpur	Bhalui Rasul	June,17	M	8	NA	NA	NA	NA	NA	NA	NA	NA	NA
				W	8	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Shekhpura	Kutaut	June,17	M	8	NA	NA	NA	NA	NA	NA	NA	NA	NA
				W	8	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chhattisgarh	Dhamtari	Sihava	March, 18	M	8	NA	NA	NA	160	180	175	300	200	200
				W	8	NA	NA	NA	150	160	150	NA	100	NA
Gujarat*	Rajkot	Rajkot	Oct,17	M	8	248	254	235	223	203	197	488	475	463
				W	8	NA	200	229	216	197	178	NA	NA	NA
	Dahod	Dahod	Oct,17	M	8	293	293	164	164	164	NA	371	321	286
				W	8	NA	250	164	164	164	NA	NA	NA	NA

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

(In Rs.)

State	District	Centre	Month & Year	Type of Labour	Normal Daily WorkingHours	Ploughing	Sowing	Weeding	Harvesting	Other Agri Labour	Herdsman	Skilled Labours		
												Carpenter	Black Smith	Cobbler
Haryana	Panipat	Ugarakheri	Oct, 17	M	8	400	400	NA	NA	400	NA	550	400	NA
				W	8	NA	300	NA	NA	300	NA	NA	NA	NA
Himachal Pradesh	Mandi	Mandi	June,16	M	8	NA	182	182	182	182	182	300	300	NA
				W	8	NA	182	182	182	182	182	NA	NA	NA
Kerala	Kozhikode	Koduvally	Oct, 17	M	4-8	960	800	NA	800	968	NA	900	NA	NA
				W	4-8	NA	NA	650	650	650	NA	NA	NA	NA
	Palakkad	Elappally	Oct, 17	M	4-8	NA	500	NA	500	500	NA	650	NA	NA
				W	4-8	NA	NA	300	300	300	NA	NA	NA	NA
Madhya Pradesh	Hoshangabad	Sangarkhera	March, 18	M	8	250	NA	250	250	250	150	400	400	NA
				W	8	NA	NA	250	250	200	150	NA	NA	`
	Satna	Kotar	March, 18	M	8	200	200	200	200	200	200	350	350	350
				W	8	NA	200	200	200	200	200	NA	NA	NA
	Shyopurkala	Vijaypur	March, 18	M	8	NA	300	300	300	NA	300	300	300	NA
				W	8	NA	300	300	300	NA	300	NA	NA	NA
Odisha	Bhadrak	Chandbali	Feb, 18	M	8	300	250	300	200	300	250	450	400	350
				W	8	NA	200	250	180	250	200	NA	NA	NA
	Ganjam	Aska	Feb, 18	M	8	300	250	250	250	350	250	500	400	350
				W	8	NA	200	200	NA	200	200	NA	NA	NA
Punjab	Ludhiyana	Pakhowal	Aug, 17	M	8	480	480	NA	NA	400	NA	480	480	NA
				W	8	NA	NA	NA	NA	NA	NA	NA	NA	NA
Rajasthan	Barmer	Kuseep	March, 18	M	8	NA	NA	NA	400	NA	500	700	500	NA
				W	8	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Jalore	Sarnau	March, 18	M	8	400	300	NA	300	NA	400	300	NA	NA
				W	8	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tamil Nadu*	Thanjavur	Pulvarnatham	Feb, 18	M	8	NA	358	NA	333	368	NA	500	337	NA
				W	8	NA	NA	145	142	138	NA	NA	NA	NA
	Tirunelveli	Malayakulam	Feb, 18	M	8	NA	NA	NA	NA	425	NA	NA	NA	NA
				W	8	NA	180	173	185	400	NA	NA	NA	NA
Tripura	State Average		Oct, 17	M	8	361	323	311	317	304	306	359	324	275
				W	8	NA	256	256	252	253	280	NA	NA	NA

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

(In Rs.)

State	District	Centre	Month & Year	Type of Labour	Normal Daily WorkingHours	Ploughing	Sowing	Weeding	Harvesting	Other Agri Labour	Herdsman	Skilled Labours		
												Carpenter	Black Smith	Cobbler
Uttar Pradesh*	Meerut	Ganeshpur	Oct, 17	M	8	300	277	255	255	266	NA	450	NA	NA
				W	8	NA	272	240	231	240	NA	NA	NA	NA
	Aurraiya	Aurraiya	Oct, 17	M	8	170	175	185	307	171	NA	500	NA	.NA
				W	8	NA	NA	185	307	171	NA	NA	NA	NA
	Chandauli	Chandauli	Oct, 17	M	8	200	200	200	NA	200	NA	400	NA	NA
				W	8	NA	200	200	NA	200	NA	NA	NA	NA

M - Man
W - Woman
NA - Not Available
NR – Not Reported
* States reported district average daily wages

PRICES

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

Commodity	Variety	Unit	State	Centre	May-18	Apr-18	May-17
Wheat	PBW 343	Quintal	Punjab	Amritsar	1735	1675	1625
Wheat	Dara	Quintal	Uttar Pradesh	Chandausi	1755	1735	1625
Wheat	Lokvan	Quintal	Madhya Pradesh	Bhopal	1830	1758	1602
Jowar	-	Quintal	Maharashtra	Mumbai	2400	2400	2100
Gram	No III	Quintal	Madhya Pradesh	Sehore	3480	3102	5350
Maize	Yellow	Quintal	Uttar Pradesh	Kanpur	1380	1430	1340
Gram Split	-	Quintal	Bihar	Patna	5100	5400	7000
Gram Split	-	Quintal	Maharashtra	Mumbai	4800	4700	7500
Arhar Split	-	Quintal	Bihar	Patna	5750	5750	7500
Arhar Split	-	Quintal	Maharashtra	Mumbai	5800	5500	5700
Arhar Split	-	Quintal	NCT of Delhi	Delhi	5900	5900	5725
Arhar Split	Sort II	Quintal	Tamil Nadu	Chennai	6000	5500	5600
Gur	-	Quintal	Maharashtra	Mumbai	4100	4000	3900
Gur	Sort II	Quintal	Tamil Nadu	Coimbatore	4800	4800	4200
Gur	Balti	Quintal	Uttar Pradesh	Hapur	2370	2200	3150
Mustard Seed	Black (S)	Quintal	Uttar Pradesh	Kanpur	3430	3400	3425
Mustard Seed	Black	Quintal	West Bengal	Raniganj	NR	NR	4300
Mustard Seed	-	Quintal	West Bengal	Kolkata	4200	4100	3900
Linseed	Bada Dana	Quintal	Uttar Pradesh	Kanpur	3950	4025	4850
Linseed	Small	Quintal	Uttar Pradesh	Varanasi	4120	4250	4730
Cotton Seed	Mixed	Quintal	Tamil Nadu	Virudhunagar	1450	1450	2100
Cotton Seed	MCU 5	Quintal	Tamil Nadu	Coimbatore	2560	2560	2750
Castor Seed	-	Quintal	Telangana	Hyderabad	3900	3900	4150
Sesamum Seed	White	Quintal	Uttar Pradesh	Varanasi	7300	7400	6270
Copra	FAQ	Quintal	Kerala	Alleppey	12800	13250	9000
Groundnut	Pods	Quintal	Tamil Nadu	Coimbatore	5600	5600	5000
Groundnut	-	Quintal	Maharashtra	Mumbai	5150	4800	5800
Mustard Oil	-	15 Kg.	Uttar Pradesh	Kanpur	1310	1300	1330
Mustard Oil	Ordinary	15 Kg.	West Bengal	Kolkata	1425	1400	1400
Groundnut Oil	-	15 Kg.	Maharashtra	Mumbai	1250	1270	1550
Groundnut Oil	Ordinary	15 Kg.	Tamil Nadu	Chennai	1730	1740	1950

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

Commodity	Variety	Unit	State	Centre	May-18	Apr-18	May-17
Linseed Oil	-	15 Kg.	Uttar Pradesh	Kanpur	1425	1425	1315
Castor Oil	-	15 Kg.	Telangana	Hyderabad	1320	1320	1425
Sesamum Oil	-	15 Kg.	NCT of Delhi	Delhi	1550	1545	1520
Sesamum Oil	Ordinary	15 Kg.	Tamil Nadu	Chennai	2250	2500	2415
Coconut Oil	-	15 Kg.	Kerala	Cochin	2685	2790	1935
Mustard Cake	-	Quintal	Uttar Pradesh	Kanpur	1715	1715	1830
Groundnut Cake	-	Quintal	Telangana	Hyderabad	2571	2714	2786
Cotton/Kapas	NH 44	Quintal	Andhra Pradesh	Nandyal	4450	4350	5000
Cotton/Kapas	LRA	Quintal	Tamil Nadu	Virudhunagar	NT	NT	4300
Jute Raw	TD 5	Quintal	West Bengal	Kolkata	3925	4075	3450
Jute Raw	W 5	Quintal	West Bengal	Kolkata	3925	4075	3500
Oranges	-	100 No	NCT of Delhi	Delhi	750	750	583
Oranges	Big	100 No	Tamil Nadu	Chennai	700	600	500
Banana	-	100 No.	NCT of Delhi	Delhi	375	458	350
Banana	Medium	100 No.	Tamil Nadu	Kodaikkanal	677	676	615
Cashewnuts	Raw	Quintal	Maharashtra	Mumbai	84000	87000	95000
Almonds	-	Quintal	Maharashtra	Mumbai	73000	66000	70000
Walnuts	-	Quintal	Maharashtra	Mumbai	72000	72000	95000
Kishmish	-	Quintal	Maharashtra	Mumbai	15500	15200	11000
Peas Green	-	Quintal	Maharashtra	Mumbai	4900	3800	3200
Tomato	Ripe	Quintal	Uttar Pradesh	Kanpur	525	600	610
Ladyfinger	-	Quintal	Tamil Nadu	Chennai	1300	1500	1800
Cauliflower	-	100 No.	Tamil Nadu	Chennai	1500	1500	1700
Potato	Red	Quintal	Bihar	Patna	1270	950	750
Potato	Desi	Quintal	West Bengal	Kolkata	1500	1250	780
Potato	Sort I	Quintal	Tamil Nadu	Mettuppalayam	3343	2590	2827
Onion	Pole	Quintal	Maharashtra	Nashik	600	600	400
Turmeric	Nadan	Quintal	Kerala	Cochin	12000	12000	14000
Turmeric	Salam	Quintal	Tamil Nadu	Chennai	11500	12000	7800
Chillies	-	Quintal	Bihar	Patna	11000	11000	11500

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

Commodity	Variety	Unit	State	Centre	May-18	Apr-18	May-17
Black Pepper	Nadan	Quintal	Kerala	Kozhikode	36000	36000	47000
Ginger	Dry	Quintal	Kerala	Cochin	16000	14200	11000
Cardamom	Major	Quintal	NCT of Delhi	Delhi	77500	77500	124000
Cardamom	Small	Quintal	West Bengal	Kolkata	100000	105000	110000
Milk	Buffalo	100 Liters	West Bengal	Kolkata	5200	5200	3800
Ghee Deshi	Deshi No 1	Quintal	NCT of Delhi	Delhi	76705	76705	40020
Ghee Deshi	-	Quintal	Maharashtra	Mumbai	46200	46200	50000
Ghee Deshi	Desi	Quintal	Uttar Pradesh	Kanpur	39550	39600	37750
Fish	Rohu	Quintal	NCT of Delhi	Delhi	13500	12500	13000
Fish	Pomphrets	Quintal	Tamil Nadu	Chennai	50000	43000	34500
Eggs	Madras	1000 No.	West Bengal	Kolkata	4145	3750	4150
Tea	-	Quintal	Bihar	Patna	21300	21300	21250
Tea	Atti Kunna	Quintal	Tamil Nadu	Coimbatore	39000	38000	36000
Coffee	Plant-A	Quintal	Tamil Nadu	Coimbatore	23000	23000	35000
Coffee	Rubusta	Quintal	Tamil Nadu	Coimbatore	13500	13500	30000
Tobacco	Kampila	Quintal	Uttar Pradesh	Farukhabad	3850	4000	4200
Tobacco	Raisa	Quintal	Uttar Pradesh	Farukhabad	1800	1900	3100
Tobacco	Bidi Tobacco	Quintal	West Bengal	Kolkata	14200	14200	13200
Rubber	-	Quintal	Kerala	Kottayam	11800	10900	12200
Arecanut	Pheton	Quintal	Tamil Nadu	Chennai	56000	56000	32700

3. WHOLESALE PRICES OF SOME IMPORTANT AGRICULTURAL COMMODITIES IN INTERNATIONAL MARKETS DURING YEAR 2018

Commodity	Variety	Country	Centre	Unit	JAN	FEB	MAR	APR	MAY
CARDAMOM	Guatmala Bold Green	U.K.	-	Dollar/MT	18500	19500	19500	19500	19500
				Rs./Qtl	117642	126477	126887	130065	132483
CASHEW KERNELS	Spot U.K. 320s	U.K.	-	Dollar/MT	11535	11346	11368	10823	10038
				Rs./Qtl	73351	73593	73973	72187	68198
CASTOR OIL	Any Origin ex tank Rotterdam	Netherlands	-	Dollar/MT	1612	1652	1602	1567	1566
				Rs./Qtl	10251	10716	10427	10451	10638
CHILLIES	Birds eye 2005 crop	Africa	-	Dollar/MT	5800	4800	4800	4800	4800
				Rs./Qtl	36882	31133	31234	32016	32611
CLOVES	Singapore	Madagascar	-	Dollar/MT	7900	8100	7750	7750	7900
				Rs./Qtl	50236	52537	50429	51693	53673
COCONUT OIL	Crude Phillipine/ Indonesia, cif Rotterdam	Netherlands	-	Dollar/MT	1365	1260	1095	1115	1080
				Rs./Qtl	8680	8172	7125	7437	7338
COPRA	Phillipines cif Rotterdam	Phillipine	-	Dollar/MT	769	716	681	672	670
				Rs./Qtl	4890	4644	4431	4479	4552
CORRIANDER		India	-	Dollar/MT	1650	1650	1650	1650	1650
				Rs./Qtl	10492	10702	10737	11006	11210
CUMMIN SEED		India	-	Dollar/MT	3300	3300	3000	3000	3000
				Rs./Qtl	20985	21404	19521	20010	20382
MAIZE		U.S.A.	Chicago	C/56 lbs	355	367	386	390	390
				Rs./Qtl	887	935	987	1022	1041
OATS		CANADA	Winnipeg	Dollar/MT	340	327	291	286	294
				Rs./Qtl	2164	2123	1895	1905	1995
PALM KERNAL OIL	Crude Malaysia/ Indonesia, cif Rotterdam	Netherlands	-	Dollar/MT	1255	1140	1030	970	960
				Rs./Qtl	7981	7394	6702	6470	6522
PALM OIL	Crude Malaysian/ Sumatra, cif Rotterdam	Netherlands	-	Dollar/MT	685	663	680	665	630
				Rs./Qtl	4356	4297	4425	4436	4280
PEPPER (Black)	Sarawak Black lable	Malaysia	-	Dollar/MT	5000	5000	4800	4800	4800
				Rs./Qtl	31795	32430	31234	32016	32611
RAPESEED	Canola	CANADA	Winnipeg	Can Dollar/MT	485	511	516	533	532
				Rs./Qtl	2500	2610	2602	2765	2792
	UK delivered rapeseed, delivered Erith(buyer)	U.K.	-	Pound/MT	275	276	272	288	289
				Rs./Qtl	2482	2500	2484	2657	2619
RAPESEED OIL	Refined bleached and deodorised ex-tanks,broker price	U.K.	-	Pound/MT	669	697	652	665	676
				Rs./Qtl	6039	6313	5954	6135	6127

3. WHOLESALE PRICES OF SOME IMPORTANT AGRICULTURAL COMMODITIES IN INTERNATIONAL MARKETS DURING YEAR 2018-*CONTD.*

Commodity	Variety	Country	Centre	Unit	JAN	FEB	MAR	APR	MAY
SOYABEAN MEAL	UK produced 49% oil & protein ('hi-pro') ex-mill seaforth UK bulk	U.K.	-	Pound/MT	305	337	339	363	355
				Rs./Qtl	2753	3053	3096	3349	3217
SOYABEAN OIL		U.S.A.	-	C/lbs	33	32	32	30	31
				Rs./Qtl	4625	4574	4589	4410	4642
	Refined bleached and deodorised ex-tanks,broker price	U.K.	-	Pound/MT	651	657	647	630	640
				Rs./Qtl	5877	5951	5908	5812	5800
SOYABEANS		U.S.A.	-	C/60 lbs	941	1032	1041	1045	995
				Rs./Qtl	2196	2457	2486	2558	2481
	US NO.2 yellow	Netherlands	Chicago	Dollar/MT	385	423	426	444	432
				Rs./Qtl	2451	2744	2772	2958	2932
SUNFLOWER SEED OIL	Refined bleached and deodorised ex-tanks,broker price	U.K.	-	Pound/MT	724	727	723	735	747
				Rs./Qtl	6536	6585	6602	6780	6770
Wheat		U.S.A.	Chicago	C/60 lbs	435	451	486	496	490
				Rs./Qtl	1015	1074	1161	1214	1222

Source: - Public Ledger

FOREIAN EXCHANAE RATES

Currency	JAN	FEB	MAR	APR	MAY
CanDollar	51.57	51.11	50.48	51.84	52.51
UKPound	90.27	90.58	91.32	92.25	90.63
USDollar	63.59	64.86	65.07	66.7	67.94

Crop Production

SOWING AND HARVESTING OPERATIONS NORMALLY IN PROGRESS DURING AUGUST, 2018

State	Sowing	Harvesting
(1)	(2)	(3)
Andhra Pradesh	Winter Rice, Jowar (K), Bajra Maize (K), Ragi (K), Small Millets (K), Urad (K), Tur (K), Mung (K), Other Kharif Pulses, Ginger, Chillies (Dry), Groundnut, Castor seed, Cotton, Mesta, Sweet Potato, Nigerseed	Autumn rice, Small Millets (K), Mung (K), Other Kharif Pulses, Sesamum
Assam	—	Autumn Rice, Maize, Jutem Mesta
Bihar	Winter Rice, Jowar (K) Bajra, Small Millets (K), Tur (K), Groundnut, Castor seed	Jute, Mesta
Gujarat	Winter Rice, Chillies (Dry), Tobacco, Castor seed, Sesamum, Cotton	—
Himachal Pradesh	Bajra	Sesamum
Jammu & Kashmir	Small Millets (K),	Maize, Small Millets (K), (early) Sannhemp
Karnataka	Autumn Rice, Winter Rice, Bajra, Ragi, Small Millets (K), Urad (K), Mung (K), Other Kharif Pulses, Potato (Plains), Chillies (Dry), Tobacco, Castorseed, Groundnut, Cotton, Sweet Potato, Nigerseed	Maize(K), Urad(K), Mung(K), Summer Potato (Hills), Tobacco Sesamum, Sweet Potato, Sannhemp, Onion, (1st Crop)
Kerala	Winter Rice, Tur(K), Other Kharif Pulses, (Kulthi) Sesamum(2nd crop), Cotton, Tapioca (3rd Crop)	Autumn Rice, Ragi, Small Millets (K) Tur(K), Urad(K), Mung(K), Other Kharif Pulses, Lemon Grass, Tapioca (1st Crop)
Madhya Pradesh	Autumn Rice, Jowar (K), Bajra, Small Millets (K), Urad (K), Mung (K), Other Kharif Pulses, Summer Potato, Ginger, Chillies (Dry), Tobacco, Castor Seed, Sesamum, Sweet Potato, Nigerseed.	Maize
Maharashtra	Tobacco, Castor Seed, Cotton,	Maize (K)
Manipur	Sweet Potato	Autumn Rice, Maize, Jute
Orissa	Winter Rice, Summer Potato (Plains), Chillies (Dry),	Chillies (Dry.), Jute
Punjab and Haryana	Autumn Rice, Bajra, Ragi, Castor Seed	Small Millets, (K), Winter Potato (Hills).

SOWING AND HARVESTING OPERATIONS NORMALLY IN PROGRESS DURING AUGUST, 2018-*CONTD.*

State	Sowing	Harvesting
(1)	(2)	(3)
Rajsthan	Autumn Rice, Jowar (K), Small Millets (K), Urad (K), Mung (K), Other Kharif Pulses, Winter Potato (Plains), Chillies (Dry), Tobacco (2nd Crop), Groundnut, Castor Seed, Sesamum, Sannhemp.	–
Tamil Nadu	Autumn Rice, Jowar (K), Bajra, Ragi, Small Millets (K), Tur (K), Mung (K), Sugarcane, Chillies (Dry), (Early) Groundnut (Late), Cotton, Sannhemp, Tapioca	Summer Potato, Sugarcane, Chillies (Dry), Cotton (Early), Sannhemp, Onion
Tripura	Winter Rice	Autumn Rice., Sesamum, Jute
Uttar Pradesh	Winter Rice, Bajra, Chillies (Dry), Sesamum, Sweet Patoto, Turmeric, Tapioca (1st Crop)	Maize, Chillies (Dry), Jute
West Bengal	Winter Rice, Tur (K), Ginger, Chillies (Dry), Sesamum (Early)	Autumn Rice, Maize, Chillies (Dry), Jute
Delhi	Tur (K),	—
Andaman & Nicobar	—	Autumn Rice

(K)--Kharif (R)--- Rabi

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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.

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Minus (–) indicates deficit or decrease.

ISSN 0002-1679
Regn.No.:840

P. Agri. 21-07-2018
450

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