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AGRICULTURAL SITUATION IN INDIA

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The Journal is brought out by the Directorate of Economics and Statistics, Ministry of Agriculture & Farmers Welfare, it aims at presenting an integrated picture of the food and agricultural situation in india on month to month basis. The views expressed are not necessarily those of the Government of India.

Note to Contributors

Articles on the State of Indian Agriculture and allied sectors are accepted for publication in the Directorate of Economics & Statistics, Department of Agriculture, Cooperation & Farmers Welfare's monthly Journal "Agricultural Situation in India". The Journal intends to provide a forum for scholarly work and also to promote technical competence for research in agricultural and allied subjects. Good articles in Hard Copy as well as Soft Copy (agri. situation@gmail.com) in MS Word, not exceeding five thounsand words, may be sent in duplicate, typed in double space on one side of foolscap paper in Times New Roman font size 12, addressed to the Editor, Publication Division, Directorate of Economics and Statistics, M/o Agriculture & Farmers Welfare, C-1, Hutments Dara Shukoh Road, New Delhi-110 011 along with a declaration by the author(s) that the article has neither been published nor submitted for publication elsewhere. The author (s) should furnish their e-mail address, Phone No. and their permanent address only on the forwarding letter so as to maintain anonymity of the author while seeking comments of the referees on the suitability of the article for publication.

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The journal Agricultural Situation in India has been included in the UGC approved list of journals for promotion and recruitment in academic and non-academic posts.

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Abbreviations used

N.A.—Not Available.

N.Q.—Not Quoted.

N.T.—No Transactions.

N.S.—No Supply/No Stock.

R.—Revised.

M.C.—Market Closed.

N.R.—Not Reported.

Neg.—Negligible.

Kg.—Kilogram.

Q.—Quintal.

(P)—Provisional.

Plus (+) indicates surplus or increase.

Minus (–) indicates deficit or decrease.

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CONTENTS

From Editor's Desk

Placed before our readers in this issue are: important farm sector news announcing new agricultural mechanisation solution for tackling crop residue problem, use of information communication technology; better information dissemination system; stress on the production of millets; and signing of an MoU with Iran covering cooperation in many important areas. It also covers the issue of decline in wholesale agricultural food prices, low water reservoir levels in the first quarter of the year, and two academic articles on agricultural and rural economics, and findings of one agro-economic research study on the issue of farmers suicides in Telangana state carried out by the Agro-Economic Research Centres.

The Union Cabinet's approval for promotion of agricultural mechanization for local management of crop residue in Punjab, Haryana, Uttar Pradesh and NCT of Delhi is important for all its public repercussions. Other important news concern the release of the Education Portal of ICAR by the Hon'ble Agriculture Minister, Shri Radha Mohan Singh, to provide a single window platform for disseminating information for benefits of students and farming community; Cabinet's approval for a Memorandum of Understanding (MoU) between India and Iran for cooperation in the areas of agricultural crop, horticulture, post-harvest technology, livestock improvement, seed technology, etc.; Cabinet's approval for continuation, strengthening and establishment of Krishi Vigyan Kendras till 2019-20. The farm sector news appearing in this issue also talks of Krishi Unnati Mela, held during March, 2018 in Pusa, New Delhi; the ministry of Agriculture and Farmers Welfare and the Ministry of Skill Development and Entrepreneurship signing an MoU on skill development training programmes at Krishi Vigyan Kendras on 20th March, 2018; Shri Radha Mohan Singh's emphasis on promoting organic farming through Paramparagat Krishi Vikash Yojana while addressing a conference organized by ASSOCHAM in New Delhi on 21st March, 2018; he call for according priority to production of millets to contain the problem of malnutrition in the poor while in his address to the members of the Consultative Committee of the Agriculture Ministry on 22nd March, 2018; and, finally NAFEDs signing a debt settlement agreement with its eight lender banks to make the price support scheme operations more effective in future.

So far as the agricultural outlook is concerned, the wholesale price index of food grain decreased by 6.86 percent in February, 2018 as compared to that in February, 2017. The WPI of cereals, wheat and pulses showed a declining trend; while there was an improvement in case of paddy during the same period. The cumulative pre-monsoon season rainfall in the country has been 35 percent lower than the long period average during 1st March to 21th March, 2018. Present live storage in 91 major water reservoirs in the country was 47.77 BCM as against 54.29 BCM of normal storage based on the average storage of last 10 years.

On the academic standpoint, we are sharing two articles on the issues of agricultural diversification and vegetable marketing in Himachal Pradesh. The article on nature and extent of agriculture diversification and economic growth examines the pattern of crop diversification and nature of change in cropping pattern during 1991-92 to 2009-10 in Himachal Pradesh. The study, based on secondary data, measures the extent of crop diversification on the basis of Gibbs-Martin index. Further, the extent of disparities in agriculture is assessed by the coefficient of variation. It is observed that the process of crop diversification is mainly prompted by the agro-climatic advantage, presence of large markets in the adjoining states and high degree of price responsiveness among farmers. Overall, the diversification has shown a declining trend in the state during the study period, albeit the diversification became more inclusive over time. The policy implications suggest that government should devise policies in order to motivate crop diversification in low and mid hill zones and to reduce income inequalities within various agro-climatic zones of the state. The article on components of vegetable marketing is a case study in Himachal Pradesh, which aims to assess the changes in socio-economic status of vegetable growers, price spread and marketing cost of important vegetables on the basis of field survey data for 1990-91 and 2011-12. For this purpose, this study adopts a multistage stratified random sampling method to select 150 vegetable growers from the districts of Solan, Shimla and Mandi. To measure irrigation intensity, multiple cropping intensity, etc., simple statistical tools are applied. The study finds that the increase in total cost of production occurs primarily due to the increase in marketing costs. The study suggests that development of alternative agencies for the sale of vegetables might help to reduce the wide difference between the price received by farmers and paid by consumers. Further, growers should be provided with technical knowledge on post-harvest management.

The agro-economic research report shared in this issue is a study on farmer suicides in Telangana, prepared by AERC, Andhra University, Visakhapatnam. According to this study, major causes of farmer suicide are crop failure, lack of access to irrigation, drought, indebtedness, family problems, drug abuse, etc. The policy implications suggest to establish a Commodity Supply Credit System to facilitate banks to provide loans to farmers. Moreover, institutional credit level should be extended by converting the existing business agents into the village single window banking employee for ease of various village-level institutional banking works. Other policy suggestions emerging from the study are that the farmers should be provided with bore well irrigation facilities, NGOs should be encouraged to provide secular, scientific and spiritual counselling for farmers under distress, and the panchayat's role should be improved in the post-suicide redressal operations, etc.

P. C. Bodh

Farm Sector News

Cabinet approved promotion of agricultural mechanization for in-situ management of crop residue in the states of Punjab, Haryana, Uttar Pradesh and NCT of Delhi

The Cabinet Committee on Economic Affairs, chaired by the Prime Minister Shri Narendra Modi, gave its approval for promotion of Agricultural Mechanization for in-situ Management of Crop Residue in the States of Punjab, Haryana, Uttar Pradesh and NCT of Delhi.

The total outgo from the Central funds would be Rs. 1151.80 crore (Rs. 591.65 crore in 2018-19 and Rs. 560.15 crore in 2019-20).

Components of the Scheme

i. Establish Farm Machinery Banks for Custom Hiring of in -situ crop residue management machinery. Financial assistance @80% of the project cost will be provided to the cooperative societies of the farmers, FPOs, Self Help Groups, Registered Farmers Societies/ Farmers Group, Private Entrepreneurs, Group of Women Farmers.

(ii) Financial Assistance to the farmers for Procurement of Agriculture Machinery and Equipment for in -situ crop residue management. Financial assistance @50% of the machinery/ equipment will be provided to individual farmer for crop residue management.

(iii) Information, Education and Communication for awareness on in-situ crop residue management. Financial assistance will be provided to the State Government/ KVKs, ICAR Institutes, Central Government Institutes, PSUs, etc., for the activities to be undertaken towards information, education and communication. The activities will involve mass awareness campaigns through short and long films, documents, radio and TV programmes, demonstration camps at various levels, capacity building programme, advertisement in print media, star campaigning, award for Village/ Gram Panchayat for achieving Zero Straw Burning, panel discussions on Doordarshan, DD Kisan and other private channels, etc.

Beneficiaries

i. Respective State Governments, through District Level Executive Committee (DLEC), will identify various beneficiaries and location-specific agricultural equipment depending on the farming system and will identify and select beneficiaries for establishment of Farm Machinery Bank for Custom Hiring and procurement of machines on individual ownership basis to avail the benefit in transparent and time bound manner.

ii. The State Nodal Department / DLEC may tie up with the Banks for credit requirements of the beneficiaries. Name and details of selected beneficiaries will be documented at district level indicating Aadhar/UID numbers and the financial assistance will be paid through Direct Benefit Transfer (DBT).

Implementing Agencies

(i) At the Central level, the scheme will be administered by Department of Agriculture, Cooperation and Farmers Welfare.

ii. A National Steering Committee, headed by Secretary, DAC&FW, will formulate the policy and give overall directions and guidance to the implementation of the scheme by the State Government and will monitor and review its progress and performance.

iii. Executive Committee, chaired by Additional Secretary, will oversee the activities of the scheme.

(iv) At the State level, the nodal implementing agency will be the Department of Agriculture of the concerned State Government. State Level Executive Committee (SLEC), chaired by Principle Secretary (Agriculture)/ Agriculture Production Commissioner, shall oversee the implementation of the scheme in their State through regular meeting and will provide inputs to Executive Committee for appropriate policy formulation. The SLEC shall ensure that no crop residue burning takes place in the farmer field.

Source: www.pib.nic.in

(v) The District Level Executive Committee shall be responsible for carrying forward the objectives of the scheme for project formulation, implementation and monitoring in the districts and will constitute Surveillance Committees involving farmers group / progressive farmers to mobilize farmers for not burning the crop residue and will also ensure active participation of Panchayati Raj Institutions.

(vi) The DAC&FW will empanel the manufacturer of machines and equipment identified for in-situ management of crop residue alongwith their costs.

Government's policy initiatives in last three years have led to record foodgrain production this year: Union Agriculture Minister

Government's policy initiatives in the last three years have led to record foodgrain production this year. This was stated by the Union Minister of Agriculture and Farmers Welfare, Shri Radha Mohan Singh, while addressing Vice Chancellors of State Agriculture Universities and Directors of ICAR (Indian Council of Agricultural Research) Institutes in NASC Complex, New Delhi, on 8th March, 2018. Shri Singh said that the total food grain production in the country stood at 275.68 million tonnes in 2017-18, which is about 10.64 million tonnes (or 4 percent) more than what was produced in 2013-14. In fact, the production of foodgrain this year is 19 million tonnes more than the average production between 2011-12 and 2015-16. Horticulture, which contributes significantly to nutrition, also witnessed record production at 305 million tonnes in 2016-17, 4.8% more than last year. The production of fruits has crossed 93 million tonnes and vegetables 178 million tonnes. The technologies developed by State Agriculture Universities and ICAR have played a praiseworthy role.

The Minister said State Agriculture Universities and ICAR have been working to make agriculture sustainable and beneficial for our farmers. Despite the challenges, agriculture universities and ICAR have made remarkable progress in agriculture productivity and production thereby helping small and marginal farmers in enhancing their income. Significant steps have been taken to attain Hon'ble Prime Minister Shri Narendra Modi's vision of "Doubling Farmers' Income by 2022". In a coordinated effort, agriculture universities and ICAR institutes along with various state and central agencies have developed "Strategy Document on Doubling Farmers' Income by 2022 for different States. This will immensely help in achieving the prosperity of farmers. In addition to this, special emphasis has been given on developing new technologies, integrated farming system, institution building, and human resource, diversification in agriculture, creating new opportunities and developing new sources of information.

Shri Radha Mohan Singh informed that there are about 138 million landholders in the country, out of which about 85% of the farmers are marginal (67%) or small (18%). He asserted that this vulnerable class of farmers is in an urgent need of farming techniques and information. ICAR has developed 45 Integrated Farming System (IFS) models to help small and marginal farmers to tide over the problems associated with climate change. This model is being replicated and taken forward through KVKs spread across the country. Besides this, ICAR has developed 623 certified District Level contingency schemes and organized skill development programs for 40.9 lakh farmers. In order to assist the Government's "Soil Health Card" initiative, minilabs were developed for soil testing. ICAR, through its KVKs, spread across the country have displayed climate friendly techniques in 29 States. ICAR has also developed 42 organic farming techniques, which were tested and are being further improved. The government, for the benefit of farmers, has initiated several programs like agriculture extension, Sankalp Se Siddhi, 'Mera Gaon Mera Gaurav, infrastructure development, agriculture education, agricultural research, international cooperation, technology transfer, etc.

Shri Radha Mohan Singh released Education Portal – ICAR at the Conference of Vice Chancellors of Agriculture Universities and Directors of ICAR Institutes

Union Minister of Agriculture and Farmer Welfare, Shri Radha Mohan Singh, released the Education portal of ICAR at the Conference of Vice Chancellors of Agriculture Universities and Directors of ICAR Institutes in New Delhi on 8th March, 2018. The portal has been developed on the lines of KVK portal released by the Union Agriculture Minister earlier.

Education Portal-ICAR (https://education.icar.gov.in) will act as a single window platform for providing vital education information/ announcements/event schedules/e-learning resources from Agricultural Universities across

the country to the rural youth in an easy and fast way on their doorsteps. The portal will also help in management, monitoring and promoting activities/ schemes of Education Division, ICAR. Education Portal-ICAR has been designed and developed by the Division of Computer Application, Indian Agricultural Statistics Research Institute (IASRI) under the guidance of Agricultural Education Division, ICAR. The portal has been developed as an ICAR initiative under the Digital India programme of the Prime Minister of India and for the first time all the Agriculture universities have come on the single platform to disseminate the information for benefits of students and farming community.

Features of the Portal

- Provides information on "Strengthening and Development of Higher Agricultural Education in India".
- Provides link and covers vital information of Agricultural universities for the benefit of students.
- Provides information about Courses (Bachelor, Master and Doctoral), Facilities, Student Strength, Faculty Strength and Scholarships.
- Provides Admission Announcements uploaded by universities under "Notifications" at the central place.
- Provides information and search facility about "Events" organized by universities under "Event" menu.
- Provides Advance Search Facility with multiple search options such as Stream, Subject, Course Category and University/College information on Courses along with seats, eligibility criteria and other information.
- Provision for generation of Unique Student ID (USID) by the universities/colleges and the information on the same is displayed university wise under different categories on the home page under the link USID.
- USID will ensure the uniqueness corresponding to the student records in various academic processes and associated online systems.
- Provides access to Academic Management System developed by ICAR-IASRI and operational at Deemed and Central Universities of ICAR. Portal also provides links to other resources/sites important in the arena of Agricultural Education.
- Portal is being used by Education Division, ICAR for data management of Annual reports, financial sanction and release of funds on the basis of online demand and relevant data submitted by universities.
- Several checks, Standard and MIS reports have been developed in the Portal to aid in the monitoring of data.

Budget 2018 lays special emphasis on animal husbandry: Union Agriculture Minister

Union Minister of Agriculture and Farmers' Welfare, Shri Radha Mohan Singh, said that for the last 20 years, India has been the largest producer of milk in the world. Shri Singh lauded the role of National Dairy Research Institute (NDRI) like research centres for catering to the technical and human resource requirements of the dairy sector. The Union Agriculture Minister said this at the 16thconvocation ceremony of ICAR-National Dairy Research Institute (NDRI) in Karnal (Haryana) on 10th March, 2018.

Shri Singh said that the milk production has increased by 20% from 137.7 million tonnes to 165.4 million tonnes between 2014 and 2017. The per capita availability of milk has risen by 15.6% from 307 gms/day to 355 gms/day between 2013-14 and 2016-17. Similarly, the income of dairy farmers has increased by 23.77% between 2011-14 and 2014-17. He informed that the Government is committed towards ensuring more income to farmers, uplifting the economically backward sections of society, youth employment, better education and healthcare.

Union Minister further said that the Government has initiated the "National Mission on Bovine Productivity" in order to help the benefits of animal husbandry schemes reach the farmers directly. In order to increase the number of cattle and buffaloes through breeding inputs, the Government, under this scheme, is spending Rs 825 crores for genetic upgradation. The scheme has been a roaring success in terms of increasing milk production and productivity and thereby proving beneficial to the dairy business. The Government has started a portal e-pashuhaat, under National Mission on Bovine Productivity, to connect breeders with milk producers.

Shri Singh added that Budget 2018 has laid special emphasis on animal husbandry. In the previous budget, the Dairy Processing & Infrastructure Development Fund (DIDF) was set up with National Bank for Agriculture and Rural

Development (NABARD) with a corpus of Rs 10,881 crore. This year, the Government, with a corpus of Rs2,450 crore, has set up an Animal Husbandry Infrastructure Development Fund (AHIDF) for financing infrastructure requirement of animal husbandry sector. In order to meet the working capital requirement of dairy farmers, the facility of Kisan Credit Card has been extended by the government to the fisheries and livestock farmers.

Agriculture Minister said that these initiatives of the Government are intended to increase the potential of self employment in livestock through entrepreneurship. NDRI is committed to training the youth so that they become job-providers instead of job-seekers. He expressed satisfaction over the BPD unit of NDRI in training ntrepreneurs.

Shri Singh said the Government has launched "Rashtriya Gokul Mission" that aims to conserve and develop indigenous breeds. Acting as centres for the development and protection of Indigenous Cattle breeds, 20 Gokul Grams have been approved in 13 states.The Government has established two National Kamdhenu Breeding Centres in the country, in Itarsi, Hoshangabad in Northern region and in Chintaladevi, Nellore in Southern region.

Cabinet approved MoU between India and Iran for cooperation in the field of agriculture and allied sectors

The Union Cabinet, chaired by Prime Minister Shri Narendra Modi, gave its ex-post-facto approval for a Memorandum of Understanding (MoU) between India and Iran for cooperation in the field of agriculture and allied sectors. The MoU was signed on 17th February, 2018 during the visit of the President of Iran to India.

The MoU provides for cooperation in the areas of agricultural crops, agricultural extension, horticulture, machinery, post harvest technology, plant quarantine measures, credit and cooperation. It also provides for cooperation in soil conservation and water management, integrated nutrients management, seed technology and agricultural marketing. Livestock improvement, dairy development, animal health and other fields as mutually agreed upon fall within the scope of this MoU. Cooperation will also be effected through exchange of experts, materials and information, exchange of trainees and scientists on study visits/ training programmes, facilitation of relevant conferences and workshops and any other means as may be mutually agreed upon.

Under the MoU, a Joint Working Group (JWG) would be formed to monitor the activities carried out in fulfillment of this MoU. The JWG will hold its meeting alternately in India and Iran once in every two years. The MoU will be valid initially for a period of five years and will be automatically extended for a subsequent period of five years unless either party notifies the other party of its intent of terminating it.

Important information on agricultural research was the main attraction of Krishi Unnati Mela 2018: Shri Radha Mohan Singh

India is moving towards Digital and Mobile revolution and even far-flung villages have access to mobile phones. We have been seamlessly linking Information Technology with agriculture and in order to establish direct connection between the government and farmers, mobile and internet plays a key role. This was stated by Union Minister of Agriculture and Farmers' Welfare Shri Radha Mohan Singh at the Krishi Unnati Mela 2018 in Pusa, New Delhi. Shri Singh Said that several websites, portals, apps, SMSes are being used to provide information to farmers at the right time. Important information on agricultural research is the main attraction of this fair.

Union Agriculture Minister also said that for new harvesting techniques through organic means and its successful implementation, the Jaivik Mahakumbh pavilion was a special attraction at the fair. He said that in order to give a boost to Cooperatives, a Sahakar Sammelan was also being organized. Apart from this, 9 farmers-scientist discussions (3 each day) were also being organized on important issues. Exclusive seed selling counters have also been set up in the fair.

More than 800 stalls had been set up by the Central and State Governments, various organizations, etc., in this fair. Ways to enhance farmers' income through theme pavilions like micro irrigation, neem-coated urea, soil check/Soil Health Card, reducing costs through less use of fertilizer, effectiveness of crop insurance scheme and new dimensions of income generation, such as animal husbandry, bee keeping, poultry farming, are being showcased. Through a Live demo, farmers could witness actual farming at the fair.

Hon'ble Prime Minister Shri Narendra Modi, on March 17, 2018, addressed the farmers, agricultural scientists and other participants during the mela. He inaugurate the Jaivik Kheti portal and laid the foundation stone of 25 KVKs. He also conferred the Krishi Karman Award & Pandit Deen Dayal Upadhaya Krishi Vigyan Protsahan Puruskar.

Ministry of Agriculture & Farmers Welfare and Ministry of Skill Development & Entrepreneurship signed MoU on skill development training programmes at Krishi Vigyan Kendras

The Ministry of Agriculture and Farmers' Welfare and the Ministry of Skill Development and Entrepreneurship, on 20th March, 2018, signed a MoU to conduct skill development training programmes for agriculture and allied sector, on a regular basis, at Krishi Vigyan Kendra (KVKs). Meanwhile, the skill development training programmes currently being run across KVKs will continue.

The Minister of Agriculture and Farmers' Welfare Shri Radha Mohan Singh expressed happiness over the signing of MoU, which he said, would help increase cooperation. Also present on the occasion were Ministers of State for Agriculture and Farmers' Welfare Shri Parshottam Rupala, Shri Gajendra Singh Shekhawat and Smt. Krishna Raj along with Shri Dharmendra Pradhan, the Minister of Petroleum and Natural Gas and Skill Development and Entrepreneurship and Shri Anant Kumar Hegde, Minister of State for Skill Development and Entrepreneurship.

Shri Radha Mohan Singh said that his Ministry is making fast progress in fulfilling Hon'ble Prime Minister's dream of "Kaushal Bharat-Kushal Bharat". He said the government believes that agriculture must be developed as a private enterprise so that it attracts more youth. For this, he said, the Ministry is working at four levels, namely, Increase productivity, Post-harvest management and fair-prices to the farmers for their produce, Lower risk in agriculture, Strengthen and develop other aspects of farmers' income such as horticulture, animal husbandry, beekeeping, dairying, fisheries etc.

In view of the latest developments in agriculture, several new dimensions in agri-warehousing, cold chain, supply chain, dairy, poultry, meat, fishery, horticulture, agricultural mechanization, micro-irrigation, hydroponic greenhouses, etc, have emerged for skilled and trained youths to gain self-employment. In 2016-17, 203 skill development programmes comprising 200 hours were organized by 100 KVKs and 8 national training institutes, training 3549 youths. For this, Rs 3.53 crore was spent from Rashtriya Krishi Vikas Yojana (RKVY). In 2017-18, 94 training institutes have organized 116 skill development training programmes and imparted training to 2320 youths. A provision of Rs 2 crore has been made for conducting skill training programmes in 2017-18 which is proposed to be increased to Rs 17 crore in 2018-19.

Paramparagat Krishi Vikash Yojana to promote organic farming: Shri Radha Mohan Singh

Indiscriminate use of chemical fertilizers in Agriculture is a matter for concern and has drawn the attention of the government because of its implications on environment, socio-economic and production fronts. This was stated by the Minister of Agriculture and Farmers' Welfare Shri Radha Mohan Singh while addressing ASSOCHAM's National Conference on Organic farming in New Delhi on 21st March, 2018.

He said that India is traditionally the world's largest organic farming country. Organic farming is already being done on the basis of traditional knowledge in several parts of India. The government is committed to take India on the path of modernity in agriculture and wants to introduce new techniques. For a sustainable increase in production, the government has been promoting organic farming on priority.

He said that it is the mission of Hon'ble Prime Minister to ensure a successful "Organic Farming Revolution" in India on the lines of "Green Revolution" so that the farming community benefits from it. Through government's various schemes, approximately 23 lakh hectares of land has been made suitable for organic farming. In order to promote organic farming, the government has started the Paramparagat KrishiVikasYojana (PKVY), under which, 2 lakh hectares has been made suitable for organic farming thereby benefitting 5 lakh farmers.

The Minister further said that the main objective of National Centre of Organic Farming is to promote organic farming in the country. Other government institutions like APEDA and Ministry of Commerce, while playing a leading role in improvement and

control of certification system, are promoting the export of organic products. The government has initiated the Organic Value Chain Development for North Eastern region. The aim of the Ministry is to promote organic farming in hilly and tribal areas as the use of chemical fertilizers and pesticides in these areas is very low.

The Minister informed that the government's target is to cover 50,000 hectares under organic farming in the North Eastern states, out of which 45,918 hectares have been made suitable for organic farming and 2429 Farmers Interest Groups have been formed, thereby connecting 48949 farmers with the scheme. He said that in line with Hon'ble Prime Minister's dream, India should move towards becoming a chemical free organic country.

Production of Millets would definitely help in providing nutritional security & preventing malnutrition, especially to the poor: Shri Radha Mohan Singh

The joint efforts of the Central and State Governments and the hard work of farmers would not only increase the production of millets but also help to prevent illnesses caused due to the lack of nutritious elements in diet. This was stated by the Union Minister of Agriculture and Farmers Welfare Shri Radha Mohan Singh while addressing the members of the Consultative Committee of the Ministry of Agriculture and Farmers' Welfare on 22nd March, 2018 on Millets - 'Coarse Cereals.'

The Minister informed that millets include Jowar, Bajra, Ragi, while little millets include Kutki, Kodo, Sawa, Kangni and Cheena. Highlighting the importance of Millets, Shri Singh said that Millets are known for their nutrients. They are tolerant to drought, are photo insensitive and are resistant to climate change. The cultivation of millets requires less water than the cultivation of rice and wheat.

Millets are cultivated in low-fertile land, mountainous, tribal and rain-fed areas. These areas include Andhra Pradesh, Chhattisgarh, Gujarat, Haryana, Madhya Pradesh, Rajasthan, Maharashtra, Karnataka, Uttar Pradesh, Tamil Nadu and Telangana. In the pre-Green Revolution era, in 1965-66, millets were cultivated in 36.90 million hectares. In 2016-17, the area under millet cultivation declined to 14.72 million hectares (60% less coverage area) due to change in consumption pattern, dietary habits, unavailability of millets, low yield, less demand and conversion of irrigated area for cultivation of rice and wheat. As a result of this, nutrients like protein, Vitamin-A, iron and Iodine levels fell in women and children. Production of millets would definitely help in providing nutritional value, especially to the poor. Besides providing nutritional security, it also helps in preventing malnutrition.

Hon'ble Prime Minister in the meeting held on July 18, 2017, had decided to start distributing millets under Public Distribution System (PDS) to improve nutritional security, the Minister informed. Subsequently, a meeting of the committee under the Chairmanship of Prof. Ramesh Chand, Member, NITI Ayog was held on October 13, 2017 wherein it was decided to promote millets viz. Jowar, Bajra, Ragi through PDS across the country to improve nutritional content in the diet of people. On the basis of the recommendations of NITI Ayog, it has been decided to create a sub mission on Nutri cereals instead of the existing NFSM-Coarse Cereals. Under National Food Security Mission (NFSM), -Coarse Cereals are divided into two components: NFSM (Makka and Jau) and Sub Mission on Nutri-Cereals covering Jowar, Bajra, Ragi and little millets like Kutki, Kodo, Sawa, Kangni and Cheena.

The Government has also decided to declare 2018 as "National Year of Millets". In case of an emergency, the cultivation of millets is very suitable for small and marginal farmers. In order to promote millets, their prescribed purchases in MSP and inclusion in Mid-day Meal are being done.

Dedicated research is being carried out to enhance food production through National Agricultural Research System: Shri Parshottam Rupala

The Minister of State for Agriculture and farmers welfare, Shri Parshottam Rupala, in a written reply to a question on research in food production in Lok Sabha stated that the ICAR is well aware about the fact and dedicated research is being carried out to enhance food production through National Agricultural Research System. The NARS is continuously developing improved varieties, value added products, production and protection technologies which resulted to increase production and productivity of food crops in the country. As per second advanced estimate, a record production of 277.48 mt of food grains and 305.42 mt fruits and vegetables have been achieved in the country

during 2017-18 which provides food and nutritional security to people of the country. ICAR is initiating the new research programme in the areas of Hybrid technology, Transgenic, Molecular Breeding, Gene Editing, Agro-biodiversity and Bio-fortification, etc., to fulfill the future food requirement of the ever growing population of the country.

Replying to a sub question on whether the Government has identified the States which are environmentally more suitable for cultivation of bananas and sugarcane other than the current major producing states, the Minister of State informed that Banana & Sugarcane are being cultivated in Tropical and subtropical areas of the country due to suitable agro-climatic conditions and availability of adequate irrigation facility.

The Government has recognized the states of Punjab, Uttar Pradesh, Rajasthan, Haryana, Uttarakhand, Jharkhand etc. as non-traditional states for banana cultivation. States where banana was grown as a back-yard crop have also taken up commercial cultivation, especially North Eastern states like Tripura, Meghalaya, Mizoram, Nagaland, Manipur, Andaman & Nicobar Islands.

Sugarcane is being cultivated mainly in the states of Uttar Pradesh, Maharashtra, Karnataka, Tamil Nadu, Bihar, Gujarat, Punjab, Uttarakhand, Andhra Pradesh, Telangana and Haryana. However, there is very little scope to extend the sugarcane area in other states of the country.

The Government is encouraging banana cultivation through sensitization, training, supply of quality planting material and other inputs. Besides, Govt. has introduced CHAMAN (Co-ordinated Horticulture Assessment and Management Using geoiNformatics) Scheme for 7 horticultural crops (Potato, Onion, Chilli, Tomato, Mango, Banana and Citrus) in 12 major states in 180 districts to carry out research on horticultural crop condition studies, diseases assessment and precision farming.

NAFED signed the debt settlement agreement with its eight lender banks

National Agricultural Cooperative Federation of India Ltd. (NAFED) signed the Debt Settlement Agreement with its eight lender banks at its Headquarter, New Delhi. The One Time Settlement with the lender banks has been made at Rs. 478 Crore with the cash payment of Rs. 220 Crore and assignment of sale rights of one of its prime properties located at Lawrence Road, New Delhi. In addition, the lenders are entitled to the assignment of auction right of the property of one of the defaulters of its tie-up business conducted in the years 2003-05. The Deputy General Manager, Central Bank of India signed the agreement on behalf of lender banks with Addl. Managing Director AMD, NAFED.

It may be recalled that the Federation had mired itself with a number of controversial businesses conducted with private parties when the borrowings made from banks were diverted to the private associates without proper collateral/securities. This has led to the default by NAFED to its bankers as the monies were not returned by the business associates. Such defaults had reached a level, when NAFED had no money to pay in the years 2011-12, forcing banks to declare NAFED's account as NPA.

The organization serves the farmers throughout the country by implementing the Price Support Scheme of Govt. of India for Oilseeds, Pulses, Copra & Cotton. Though the fund requirement of the PSS was separately provided to the Organization through sovereign guarantee, but its problems with banks many times created hurdles in smooth withdrawals even against government guarantee, affecting payment to the farmers. It is hoped that with this settlement, the Price Support Scheme operations will be more smooth and effective. During the last three years, the Federation has made record procurement of Oilseeds & Pulses at MSP under PSS. Further, it has been the major agency having procured around 90% of the buffer target of Pulses.

Cabinet approved continuation, strengthening and establishment of Krishi Vigyan Kendras till 2019-20

The Cabinet Committee on Economic Affairs, chaired by Prime Minister Shri Narendra Modi, has approved the proposal of the Department of Agricultural Research and Education for continuation / strengthening, upto 2019-20, of 669 Krishi Vigyan Kendras(KVKs) established till 31.03.2017, 11 Agricultural Technology Application Research Institutes (ATARIs), support to the Directorates of Extension Education (DEEs) of Agricultural Universities (AUs) and all special programmes associated with the Scheme and establishment of 76 spill over KVKs as already

approved in the 12thPlan.

Financial Outlay:

The financial outlay for the KVK Scheme [including Directorate of Knowledge Management in Agriculture (DKMA)] for 2017-20 shall be of Rs 2,82,400.72 lakh.

Details:

KVKs would act as knowledge and resource centre in the field of agriculture in the district and would build models of technology uptake and farmers' empowerment leading to support Government of India's initiative of doubling farmers' income.

The special programmes which shall be initiated through the KVK Scheme are:

- a Network Project on New Extension Methodologies and Approaches; Nutri-sensitive Agricultural Resources and Innovations (NARI);
- programs tilted Knowledge Systems and Homestead Agriculture Management in Tribal Areas (KSHAMTA),
- Value Addition and Technology Incubation Centres in Agriculture (VATICA),
- Farm Innovation Resource Management (FIRM) and establishment of Agricultural Technology Information Centre.

Besides, Rain Water Harvesting, Integrated Farming System (IFS) Processing, Fish seed production, ICT enabled services, green agriculture and strengthening of soil health program shall also be supported. Further, two important programmes approved include the Farmer FIRST at 52 centres and Attracting and Retaining Youth in Agriculture (ARYA) for 100 Districts.

The ARYA component is being implemented currently in 25 States through KVKs, one district from each State with technical partners from ICAR Institutes and Agricultural Universities for taking up entrepreneurial activities through skill development of rural youth leading to employment generation. During the year 2015-16, and 2016-17, youth numbering 1,100 and 4,400 respectively have been engaged through ARYA. It is, planned to enlarge this component to cover 100 districts by adding 75 more districts during 2017-20 period. The capacity development of farmers and vocational training to youth (about 14 lakh annually) will improve fruitful engagement in farming.

Convergence:

KVK may facilitate convergence and act as the nodal agency of several schemes of the Department of Agriculture Cooperation and Farmers Welfare, Department of Animal Husbandry, Dairying and Fisheries, Ministry of Food Processing Industries and other Departments and Ministries focused on agricultural and rural development through schemes like the Soil Health Card Scheme, the Paramparagat Krishi Vikas Yojana, Rashtriya Krishi Vikas Yojana, the Pradhan Mantri Krishi Sinchai Yojana; the National Gokul Mission; the National Livestock Mission and the Pradhan Mantri Kisan SAMPADA Yojana to address issues relating to micro irrigation, Integrated Nutrient Management (INM), Integrated Pest Management (IPM), Livestock Management, Processing and Value addition and use of mobile technology, etc.

General Survey of Agriculture

Trends in foodgrain prices

Based on Wholesale Price Index (WPI) (2011-12=100), foodgrains price decreased by (-) 6.86 per cent, in February, 2018 over February 2017. During the same period, the WPI of cereals decreased by (-) 2.45 per cent, wheat by (-) 6.23 per cent and pulses by (-) 24.51 per cent, whereas WPI of paddy increased by 3.28 per cent.

The WPI of foodgrains and pulses showed fall of (-) 0.36 per cent and (-) 2.36 per cent respectively in February, 2018 over January, 2018. During this period the WPI of paddy increased by 0.53 per cent whereas WPI of wheat decreased by 0.57 per cent. The WPI of cereals remained constant during this period.

Rainfall and Reservoir situation

Rainfall Situation

Cumulative Pre-monsoon Season rainfall for the country as a whole during the period 01st March to 21st March, 2018 has been 35% 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 142% in South Peninsula but lower than LPA by 90% in Central India, 58% in North-West India and 20% in East & North East India. Out of total 36 meteorological Sub-divisions, 09 met subdivisions received large excess/excess rainfall, 04 subdivisions received normal rainfall, 21 Sub-divisions received deficient/large deficient rainfall and 02 Sub-division received no rain.

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 22nd March, 2018) was 47.77 BCM as against 55.56 BCM on 22.03.2017 (last year) and 54.29 BCM of normal storage (average storage of last 10 years). Current year's storage is 86% of last year's storage and 88% of the normal storage.

Economic Growth

As per the second advance estimates of national income released by CSO on 28th February 2018, the growth of GDP at constant market prices for the year 2017-18 is estimated at 6.6 per cent. The growth rate of GDP was 7.1 per cent in 2016-17 and 8.2 per cent in 2015-16.

The growth in GVA at constant basic prices for the year 2017-18 is estimated to be 6.4 per cent. At the sectoral level, agriculture, industry and services sectors are estimated to grow at the rate of 3.0 per cent, 4.8 per cent and 8.3 per cent respectively in 2017-18

As per the quarterly estimates, the growth of GDP for third quarter (October-December) of 2017-18 is 7.2 per cent, as compared to 6.8 per cent in the corresponding quarter of the previous year.

The share of total final consumption in GDP at current prices in 2017-18 is estimated to be at 70.2 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 expected to remain same at 28.5 per cent in 2017-18 (as per 2nd revised estimate) as was in 2016-17.

The saving rate (measured as a share of gross saving to GDP) for the years 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

The cumulative rainfall received for the country as a whole, during the period 1st March 2018 to 14th March 2018, has been 58 per cent below normal. The actual rainfall received during this period has been 5.4 mm, as against the normal at 12.8 mm. Out of the total 36 meteorological subdivisions, 1 subdivision received large excess rainfall, 2 subdivisions received

excess rainfall, 2 subdivisions received normal rainfall, 3 subdivisions received deficient rainfall, 21 subdivisions received large deficient rainfall and 7 subdivisions received no rainfall at all.

Production of Foodgrains

As per the 2nd Advance Estimates released by Ministry of Agriculture & Farmers Welfare on 27th February 2018, the production of foodgrains during 2017-18 is estimated at 277.5 million tonnes, as compared to 275.1 million, as tonnes in 2016-17(Final Estimates) (Table 3).

Procurement

Procurement of Rice as on 1st March 2018 during Kharif Marketing Season 2017-18 was 30.1 million tones, whereas procurement of wheat during Rabi Marketing Season 2017-18 was 30.8 million tonnes (Table 4).

Off-take

The offtake of rice under all schemes during the month of January 2018 has been 27.7 lakh tonnes. This comprises 25.8 lakh tonnes under TPDS/ NFSA (offtake against the allocation for the month of February, 2018) and 2.0 lakh tonnes under other schemes. In respect of wheat, the total offtake has been 20.8 lakh tonnes comprising 18.4 lakh tonnes under TPDS/NFSA (offtake against the allocation for the month of February, 2018) and 2.4 lakh tonnes under other schemes. The cumulative offtake of foodgrains during 2017-18 is 54.0 million tonnes (Table 5).

Stocks

The total stocks of rice and wheat held by FCI as on 1st February 2018 was 51.3 million tones, as compared to 40.5 million tonnes as on 1st February 2017 (Table 6).

TABLES

TABLE 1 : Growth of GVA at Basic Prices by Economic Activity at Constant (2011-12) Prices (per cent)

Sectors	Growth Rate (%)			Share in GVA or GDP (%)		
	2015-16 2nd RE	2016-17 1st RE	2017-18 2nd AE	2015-16	2016-17 1st RE	2017-18 2nd AE
Agriculture, forestry & fishing	**0.6**	**6.3**	**3.0**	**15.4**	**15.3**	**14.8**
Industry	**9.8**	**6.8**	**4.8**	**1.6**	**31.5**	**31.0**
Mining & quarrying	13.8	13.0	3.0	3.1	3.3	3.2
Manufacturing	12.8	7.9	5.1	18.1	18.2	18.0
Electricity, gas, water supply & other utility services	4.7	9.2	7.3	2.1	2.2	2.2
Construction	3.7	1.3	4.3	8.2	7.8	7.7
Services	**9.6**	**7.5**	**8.3**	**53.0**	**53.2**	**54.2**
Trade, Hotel, Transport Storage	10.3	7.2	8.3	19.0	19.0	19.3
Financial , real estate & prof services	10.9	6.0	7.2	21.9	21.7	21.8
Public Administration, defence and other services	6.1	10.7	10.1	12.2	12.6	13.0
GVA at basic prices	**8.1**	**7.1**	**6.4**	**100.0**	**100.0**	**100.0**
GDP at market prices	8.2	7.1	6.6	---	---	---

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

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

Sectors	2015-16				2016-17				2017-18		
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
Agriculture, forestry & fishing	**2.3**	**2.7**	**-2.3**	**1.0**	**4.3**	**5.5**	**7.5**	**7.1**	**2.7**	**2.7**	**4.1**
Industry	**7.9**	**7.6**	**10.7**	**11.0**	**8.3**	**6.8**	**7.1**	**5.0**	**0.1**	**5.9**	**6.8**
Mining & quarrying	11.3	11.4	12.0	12.3	10.5	9.1	12.1	18.8	1.8	7.1	-0.1
Manufacturing	9.7	10.9	14.8	14.2	9.9	7.7	8.1	6.1	-1.8	6.9	8.1
Electricity, gas ,water supply & other utility services	2.6	5.6	3.9	7.6	12.4	7.1	9.5	8.1	7.1	7.7	6.1
Construction	4.3	0.2	4.3	4.6	3.0	3.8	2.8	-3.9	1.5	2.8	6.8
Services	**9.3**	**10.2**	**9.4**	**9.8**	**9.4**	**7.9**	**6.5**	**6.3**	**9.6**	**7.1**	**7.7**
Trade, hotels, transport, communication and services related to broadcasting	10.5	8.5	10.4	13.1	8.9	7.2	7.5	5.5	8.4	9.3	9.0
Financial, real estate & professional **services**	10.4	13.3	10.2	8.8	10.5	8.3	2.8	1.0	8.9	6.4	6.7
Public administration, defence and Other Services	5.5	6.6	6.9	6.1	7.7	8.0	10.6	16.4	13.2	5.6	7.2
GVA at Basic Price	**7.8**	**8.4**	**7.3**	**8.7**	**8.3**	**7.2**	**6.9**	**6.0**	**5.6**	**6.2**	**6.7**
GDP at market prices	**7.8**	**8.1**	**7.1**	**9.1**	**8.1**	**7.6**	**6.8**	**6.1**	**5.7**	**6.5**	**7.2**

Source: Central Statistics Office (CSO).

TABLE 3 : Production of Major Agricultural Crops (2ND adv. est.)

Crops	Production (Million Tonnes)					
	2012-13	2013-14	2014-15	2015-16	2016-17 (FINAL)	2017-18 (2nd AE)
Total Foodgrains	**257.1**	**265.0**	**252.0**	**251.6**	**275.1**	**277.5**
Rice	105.2	106.7	105.5	104.4	109.7	111.0
Wheat	93.5	95.9	86.5	92.3	98.5	97.1
Total Coarse Cereals	40.0	43.3	42.9	38.5	43.8	45.4
Total Pulses	18.3	19.3	17.2	16.4	23.1	24.0
Total Oilseeds	30.9	32.8	27.5	25.3	31.3	29.9
Sugarcane	341.2	352.1	362.3	348.4	306.1	353.2
Cotton#	34.2	35.9	34.8	30.0	32.6	33.9

Source: DES, DAC&FW, M/o Agriculture & Farmers Welfare.
Notes: 2ndAE: 2ndAdvance Estimates, # Million bales of 170 kgs. each.

TABLE 4 : Procurement of Crops (Million Tonnes)

Crops	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Rice#	35.0	34.0	31.8	32.0	34.2	38.1	30.1
Wheat@	28.3	38.2	25.1	28.0	28.1	23.0	30.8
Total	**63.3**	**72.2**	**56.9**	**60.2**	**62.3**	**61.1**	**60.9**

Source: FCI and DFPD, M/o Consumer Affairs, Food and Public Distribution.
Notes: # Kharif Marketing Season (October-September), @ Rabi Marketing Season (April-March), Procurement of rice as on 01.03.2018.

TABLE 5 : Offtake of Foodgrains (Million Tonnes)

Crops	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18 *
Rice	32.6	29.2	30.7	31.8	32.8	31.6
Wheat	33.2	30.6	25.2	31.8	29.1	22.4
Total (Rice & Wheat)	**65.8**	**59.8**	**55.9**	**63.6**	**61.9**	**54.0**

Source: DFPD, M/o Consumer Affairs.
*Note: Food and Public Distribution. *: upto January, 2018.*

TABLE 6 : Stocks of Foodgrains (Million Tonnes)

Crops	February 1, 2017	February 1, 2018
1. Rice	17.0	19.9
2. Unmilled Paddy#	18.3	21.0
3. Converted Unmilled Paddy in terms of Rice	**12.0**	**13.9**
4. Wheat	**11.5**	**17.5**
Total (Rice & Wheat)(1+3+4)	**40.5**	**51.3**

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

Articles

Nature and Extent of Agriculture Diversification and Economic Growth in Himachal Pradesh

SANDEEP KUMAR[1], RANVEER SINGH[2] AND AMIT SHARMA[3]

Abstract

The economy of Himachal Pradesh is mainly agrarian. The crop diversification mainly started with cultivation of apple and vegetable crops, which has made a significant impact on levels of household income and employment. Present study tried to analyse the pattern of crop diversification and find out the nature of change in cropping pattern during the period lying between 1991-92 and 2009-10 in Himachal Pradesh. The agro climatic advantage, availability of large market in the neighbouring states and high degree of price responsiveness among farmers triggered the process of crop diversification. Although the pace of diversifying to cash crops for commercialization is high but saw a decline in last decade (2001 to 2010).Although overall diversification in state reduced during the period but in spite of this, the diversification became more inclusive.Diversification push in low and mid hill zones can further decrease the income inequalities within different agro climatic zone.

Key words: *Crop diversification, Economic growth, Cropping pattern, Himachal Pradesh.*

Introduction

This paper aims to study the nature and extent of agriculture diversification in Himachal Pradesh (HP) and across major agro-climatic zones/districts of the state. Crop diversification refers to the raising of various crops in a given area in a crop season. In the rural areas, particularly in Himachal Pradesh, for sustainable income and employment, people seems to be very much dependent on the degree of diversification of land use by cultivating various types of crops. However, due to lack of infrastructure and others inputs, the agricultural sustainability and diversification are hampered (Das & Mili, 2012).

Agriculture diversification and land holding sizes directly relate to each other. The direct relationship may be due to congenial conditions for diversification on large farms, whereas low diversification on the marginal farms was due to resource constraints both land as well as capital (Chand, Singh, & Sharma, 1986). Fortunately, agro-ecological conditions in the state favour diversification of crops. The pace of diversifying to cash crops for commercialization is although high but saw a decline in last two decades (1991 to 2001 & 2001 to 2010). Further, between 1980-90 and 2004-05, the decreasing number of crops resulting in low level of diversification in both tribal as well as non-tribal areas of the state. (Raj, October 2010). The valley areas of the State are most suited for growing foodgrains.The high hill (wet & dry) zone and mid hill zone of HP are favourable for agro-biodiversity. Elsewhere, due to climatic conditions varying from sub-tropical to temperate, the agro-climatic conditions are suitable for growing a wide variety of cash crops such as temperate fruits, potatoes, vegetables, ginger, etc. Since the scope for extension of cultivation is limited, emphasis has to be laid on production by maximizing output per unit area available for cultivation (Vaidya, 2006). Against this backdrop, this paper analyses the nature and level of crop diversification in Himachal Pradesh. Moreover, this study also intends to explore the relationship between crop diversification and per capita income or inclusive growth.

Data and Method

The study is based on secondary data, collected from the state departments of Economics and Statistics,

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land records, horticulture, animal husbandry and agriculture and other published documents. To get a sophisticated measurement of crop diversification, Gibbs Martin Index of crop diversification is used. The formula reads as follows:

Gibbs-Martin Index= $\sum(x^2)/ (\sum x)^2$

Where, x refers to the percentage of total cropped area occupied by each individual crop in hectares. The values of indices were classified into four groups ranging from high, medium, low and very low.
Disparities in agriculture are analysed by two variables like
(a)Proportion of net area sown, and
b) Cropping intensity
The extent of disparity was identified with the Coefficient of Variation (CV):

CV = (Standard Deviation/Mean) x 100

Trends in area production, productivity, per capita income and gross domestic product are studied from the period of 1991-92 to 2011-2012 by using compound growth rates.
Exponential growth function: $Y = AB^T$
And the log linear form;
Log Y = log A +T log B
Where,
Y = Area, production and productivity (any crop)
A (constant term) = Antilog (log A)
B (regression coefficient) = Antilog (log B)
T= Time period or years from 1991-92 to 2011-12
Compound Growth Rate (CGR) = (B-1) x100

Results and Discussion

Concept of crop diversification means raising a variety of crops involving intensity of competition amongst field crops for arable land: the keener the competition, the higher the magnitude of crop diversification. It is an indicator of multiplication of crops, which obviously involves intensive competition among the growing crops (Singh, 1976). The magnitude of crop diversification showed the impact of physical, socio-economic and technological influence on cropping pattern of an area (Hussain, 1996). In the face of shrinking natural resources with increasing large demand for food and agricultural production arising due to high population and income growth, crop diversification is the main source of future growth of agriculture. It is the time to critically redesign alternative cropping pattern based on agro-climatic zone (Sidhu & Johl, 2002).The crop diversification largely depends on the socio-economic conditions and technological development of the region but stronger factor is the physical environment. It means the crop diversification is the product of action, reaction and interaction among the physical and non-physical environment (Sohal, 2003). Crop diversification also gives more employment opportunities for the small farmers as well as for agricultural labourers throughout the year. There is a continuous surge for diversified agriculture in terms of crops primarily on economic consideration. Thus, it was recognized that the study of spatial patterns of crop diversification is of vital importance and almost indispensable to understand the competition that goes among different crops in Himachal Pradesh.

Nature and Extent of Diversification

The analysis revealed that in low hills, there is decreasing trend in area under various crops during the period 1991 to 2010 in all crops, except, district Kangra, where increasing trend is noticed. However, Gibbs and Martin index value of diversification in the zone varied between medium to high. The high category of crop diversification of above 65 percent was found in only district Kangra (Table-1). The rest of districts showed medium diversification in all crops in low hill zone.

The temporal changes in the cropping pattern at the mid hill temperate zone brings out the process of crop diversification towards fruits and vegetable crops. The area under crops like rice, wheat, barley, other cereals and pulses declined by varying degrees in the zone, the area under fruit crops and vegetable crops increased over the period. Districts Sirmour and Chamba showed significant improvement in diversification in all crops as compared to other districts of the zone.

There has been a significant increase in the area for fruits and vegetable in high hill and cold & dry zones. Although the overall rate of Gibbs & Martin index showed declining trend of diversification in both zones from 1991 to 2010, the growth of pulses in cold and dry zone was significant during the study period. The process of crop diversification towards horticulture including vegetable crops was also manifested in rising share of horticulture in the gross value of agricultural output.

TABLE 1 : INDEX OF CROP DIVERSIFICATION IN HIMACHAL PRADESH

	Low Hill Zone				Mid Hill Zone				High Hill Zone				Cold & Dry Zone			
Crops/ Year	1991	2000	2010	Average	1991	2000	2010	Average	1991	2000	2010	Average	1991	2010	2010	average
Wheat	45.08	46.31	46.73	46.04	35.10	36.63	36.13	35.95	27.60	30.36	22.72	26.89	7.62	4.73	1.59	4.64
Rice	7.23	6.95	6.27	6.82	7.90	7.50	7.26	7.55	4.06	2.92	2.08	3.02	0.14	0.20	0.08	0.14
Maize	36.08	39.10	40.21	39.47	35.19	36.43	34.58	35.40	21.76	19.97	19.65	20.46	3.33	2.79	1.13	2.42
Barley	0.68	0.51	0.44	0.54	3.79	3.71	3.36	3.62	4.98	5.26	4.64	4.96	18.21	17.01	10.87	15.36
Ragi	0.01	0.00	0.00	0.00	0.66	0.00	0.10	0.25	1.41	0.00	0.69	0.70	1.09	0.00	0.04	0.37
Pulses	1.96	1.33	0.51	1.27	5.33	4.49	4.70	4.84	7.34	5.05	7.06	6.48	15.98	22.91	32.50	23.80
Common Milets	0.04	0.00	0.01	0.02	1.21	0.07	0.71	0.67	4.35	1.24	1.78	2.46	13.43	15.50	7.10	12.01
Chilly	0.02	0.01	0.01	0.01	0.14	0.18	0.16	0.16	0.17	0.21	0.10	0.16	0.00	0.00	0.00	0.00
Ginger	0.03	0.07	0.04	0.05	0.50	0.40	0.61	0.50	0.06	0.10	0.11	0.09	0.00	0.11	0.00	0.04
Oil Seed	1.96	1.62	1.53	1.70	5.33	2.17	2.36	3.29	7.32	1.06	0.79	3.06	17.48	0.28	0.40	6.05
Total Vegetable	0.67	0.98	0.83	0.83	2.08	3.60	4.20	3.29	6.21	8.78	6.82	7.27	9.33	14.68	16.92	13.64
Total Fruits	0.62	1.10	1.14	0.96	2.00	2.78	2.67	2.49	14.15	19.00	32.52	21.89	10.17	11.67	26.58	16.14
Others	5.62	2.02	2.28	3.31	0.76	2.03	3.16	1.98	0.59	6.06	1.03	2.56	3.22	10.13	2.80	5.38

The above analysis revealed that there was medium to high diversification in all zones in the state. The need of the hour is to bring more land under cultivation and extension of cultivation in the low hills. Extension of cultivation in these regions can help in making cultivation economically more viable by bringing more area under cultivation. By bringing in an appropriate mix of diverse crops towards making cultivation based livelihoods more sustainable in these areas production of vegetables and quality vegetable seeds besides the seasonal vegetables is one of the fields into which the diversification has been reported during the past decades in all the four zones of the state. In those belts of the low hills where irrigation facilities are available, cultivation of vegetable is picking up.

Climatic conditions prevailing in Himachal Pradesh are conducive for growing fruits ranging from apples and stone fruits in high hills and low hills to citrus fruits, which are grown in warm temperate and sub-tropical climatic condition. Large proportion of operational holdings is being used for growing fruits in the high hills and cold and dry zones. The proportion of land being used for growing fruits was relatively low in low hills. The climatic conditions in high hill and cold zones of the State are perfectly suited for growing apple and other temperate fruits like apricot, pear and cherries. The analysis reveals that districts such as Kullu, Kinnaur, Chamba, Lahul–Spiti, Sirmour and Kangra show high degree of diversification in the state.

Spatial Distribution of Crop Diversification

According to Gibbs and Martin's index, crop diversification in low hill areas was 0.64 in 1991, 0.62 in 2000 and 0.57 in 2010 (Table-2). On the other hand, in mid hills, sub temperate zone index value was 0.73 in 1991, 0.72 in 2000 and 0.73 in 2010, which showed almost static rate of diversification in the region. It varied from 0.75 in Sirmour in 1991 and 0.77 in 2010 and in the same region, the Chamba district showed 0.72 in 1990 and 0.73 in 2010.These were the two districts, which showed high diversification in the region. Overall, average growth of diversification index was stable during the said time. High hills showed average diversification index 0.83 in 1991, 0.80 in 2000 and 0.75 in 2010 that shows that in this region, the diversification index was initially high and later there is a declining trend. The cold and dry zones index measured as 0.82 in 1991, 0.81 in 2000 and after that, it showed sharp decline of 0.70 in this zone. Thus diversification rate was high in first decade and in successive decades it was relatively low.

High Diversification:

Areas with high crop diversification (>0.65) covered the districts of Kangra, Solan, Sirmour, Mandi, Chamba, Shimla, Kullu, Kinnaur and Lahaul and

Spiti (Table-3). It indicates that there was high diversification in these regions as compared to low hill zone in which only district Kangra showed high rate of diversification.

TABLE 2 : GIBBS -MARTIN INDICES

Zone	District	1991	2000	2010
Low Hill	Hamirpur	0.57	0.55	0.54
	Kangra	0.74	0.71	0.72
	Una	0.62	0.60	0.58
	Bilaspur	0.63	0.60	0.57
	Average	0.64	0.62	0.60
Mid Hills (Sub Temperate)	Solan	0.72	0.70	0.70
	Sirmour	0.75	0.74	0.77
	Mandi	0.73	0.73	0.72
	Chamba	0.72	0.70	0.73
	Average	0.73	0.72	0.73
High Hills (Temperate)	Shimla	0.85	0.81	0.72
	Kullu	0.81	0.79	0.78
	Average	0.83	0.80	0.75
Cold and Dry Zone	Kinnaur	0.84	0.83	0.72
	Lahaul&Spiti	0.80	0.78	0.68
	Average	0.82	0.81	0.70

These districts faced the problems of hilly and dissected topography, low extent of irrigation, less developed agricultural infrastructure, low rainfall and apparently, these reasons would have led to crop diversification. Consequently, these districts harnessed their inherent agro climatic advantages. Mid hill, high hill and cold dry zone also provided ideal situations for horticultural crops production as they could grow off-season vegetables, which have significant market value at plains. The farmers of these areas get lucrative price for their produce, which also increased their income as compared to other parts of the state. This resulted in high magnitude of crop diversification in these districts. However, in case of Hamirpur, Una, Bilaspur districts, these areas had traditionally focussed on cereal crops. Due to the above-mentioned physical obstacles and less developed infrastructure, farmers had grown limited number of food crops to avoid production and market risks. This resulted in high magnitude of crop diversification but still lower than the majority of above-mentioned districts.

Moderate Diversification: Areas with moderate magnitude of crop diversification (0.55 to 0.65 index value) are Hamirpur, Una and Bilaspur districts. In these districts, the farmers preferred to grow only those crops, which respond well in the prevailing physical conditions of these areas. Farmers grew mainly wheat, rice, maze and barley in these districts during the study period owing to suitability of physical environment. Due to the suitability of physical environment, the magnitude of crop diversification was moderate in the above-mentioned districts.

Low Diversification: Low magnitude of crop diversification (0.45 to 0.55) was observed in district Hamirpur only. The index showed 0.55 in 2000 and 0.54 of index in 2010, which indicate low degree of diversification as compare to other districts (see table-3). Here, the index value of crop diversification varied between 0.45 and 0.55. It was observed that in this district, wheat, barley, maize and oil seeds were the leading crops. The main reasons for low crop diversification were the physical environment and less developed socio-economic environment. Moreover, high input cost of production, Low extent of irrigation, less developed agricultural infrastructure, less awakened farmers, etc., were the main reasons for registering low crop diversification. Besides this, increased competition from nearby

states like Punjab & Haryana remains major constraints in diversification. These areas were having low rainfall as compared to other parts of the study region. Due to this uncertainty for crop cultivation, only wheat and maize were the favourite crops of the farmers. There is no district, which has very low diversification in the state.

TABLE 3 : RANGE OF CROP DIVERSIFICATION INDEX IN HIMACHAL PRADESH

Range Of Category	Category	Crop Diversification Index			Difference	
		1991	2000	2010	1991-2000	2000-2010
Above 0.65	High	79.09	79.09	79.09	0	0
0.55-0.65	Medium	21.00	13.00	13.00	-8	0
0.45-0.55	Low	0	7.50	7.50	7.5	0
Below 0.45	Very Low	0	0	0	0	0

Table 4 reveals variation of diversification within the study period from 1991 to 2010-11 in different regions. Coefficient of variation in diversification index almost remained same in 2000 when compared to 1991. However, it reduced during the successive decade. Although overall diversification in state reduced (average 0.69) but inspite of this, the diversification became more inclusive as coefficient of variation reduced. As per available data sources in case of high diversification (above 0.65) from 1991 to 2010, there was no difference found in diversification levels within two decades i.e., the districts, which were in high diversification zone, remained the same. While in case of medium diversification areas, (0.55 to 0.65) there was significant fall in diversification between(1991 to 2000), which showed fall in diversification index. There was shift of few areas from medium diversification zone to low diversification zone by variations points equal to 7.5 (Table-4).

TABLE 4 : VARIABILITY IN CROP DIVERSIFICATION

Zone	Average Diversification Index		
	1991	2000	2010
Low Hill	0.638	0.616	0.603
Mid Hills (Sub Temperate)	0.730	0.717	0.730
High Hills (Temperate)	0.830	0.800	0.749
Cold and Dry	0.820	0.805	0.696
Coefficient of variation	10.33	10.48	8.10

Trends in Gross Domestic Product and Per Capita Income

The per capita state domestic product is used to determine both the absolute and relative performance of the economy of the state. It is also an important tool to measure the regional imbalances and the impact of diversification on standard of living of the people. According to quick estimates, the per capita income of Himachal Pradesh in 2012-13 stood at Rs.82611 (Table-5). Although about 90 percent of the people live in villages and small towns, Himachal Pradesh emerges of one of the highest per capita incomes among Indian states. The state is also said to be the fruit bowl of the country with orchards scattered all over the place (Bureau, june 2012.).

Analysis of variation in district GDPs and per capita incomes was done both inter and intra agro-climatic zones. There is gradual decrease noticed in coefficient of variations of annual growth rate of per capita income and GDP, from 20.50 to 14.4 & 15.34 to 11.36, respectively. It reflects reducing variation among different zones in 2000-2010 decade, thus the per capita income & GDP growth became more inclusive and thus less divergent (Table-6).

Analysis of co efficient of variation reveals that within agro-climatic zones, per capita income and GDP growth were becoming less divergent and more inclusive. Here the only exception occurred where intra zonal variation increased in cold and dry zone with increase in coefficient of variation from 4.67 to 28.68. Reduction in coefficient of variation was found within high hill zone.

TABLE 5 : VARIATION IN GROWTH OF PER CAPITA INCOME GROSS DOMESTIC PRODUCT

Zone	Per capita income			Gross Domestic Product		
	Per Capita Income in Rs. (1993)	CGR (1993-2001)	CGR (2002-2011)	GDP (1993)	CGR (1993-2001)	CGR (2002-2011)
Low Hill	1401	39.00	15	40606	20.6	12.7
Mid Hill	1880	30.00	21	44704	17.5	16.7
High Hill	2641	22.00	21	59404	13.9	13.9
Cold & Dry	4401	28.00	17	9110	15.0	12.9
C.V	44.18	20.50	14.04	47.66	15.34	11.36

TABLE 6 : VARIATION IN GROWTH OF PER CAPITA INCOME GROSS DOMESTIC PRODUCT

Zone	District	Per capita income			Gross Domestic Product		
		GDP (1993-94)	CGR (1993-2001)	CGR (2002-2011)	Per capita income (1993-94)	CGR (1993-2001)	CGR (2002-2011)
Low Hill	Hamirpur	20813	23.8	10.8	828	47.4	12.3
	Kangra	93639	17.1	12.6	1876	48.9	14.8
	Una	19960	24.6	13.4	694	29.8	15.2
	Bilaspur	28013	16.8	14	2207	29.7	16.1
	C.V	75.80	17.68	9.48	46.58	23.66	9.65
Mid Hills (Sub Temperate)	Solan	54742	21	16	2266	37.9	17.9
	Sirmour	33937	17.6	18.5	1663	31.5	21.8
	Mandi	54373	18.1	14.8	1432	31.3	18.2
	Chamba	35763	13.4	17.5	2159	20.3	24.4
	C.V	22.09	15.48	8.46	18.32	20.92	13.07
High Hills (Temperate)	Shimla	86882	12.5	14	3251	22.9	21.6
	Kullu	31926	15.3	13.8	2032	20.1	20.2
	C.V	46.26	10.07	0.72	23.07	6.51	3.35
Cold and Dry Zone	Kinnaur	11243	14.3	16.6	3045	23.9	23.5
	Lahaul & Spiti	6977	15.7	9.2	5757	31.6	11
	C.V	23.41	4.67	28.68	30.82	13.87	36.23

Per capita Income & Diversification

The analysis revealed that there was large variation annual growth of GDP in the state. During 1993-2000, both annual growth rates of per capita income and GDP were higher (see Table-7). However, rates recorded lesser annual growth respectively. The growth rates in both economic indicators such as state GDP and per capita income were more inclusive in high hill and dry and cold zone as compare to low hill and mid hill zone. This occurred due to uncertainty of job and structural transformation in mid and low hill zones.

TABLE 7 : CORRELATION BETWEEN DIVERSIFICATION INDEX, PER CAPITA INCOME AND GIA/GCA

District	Gibbs Martin Index	Per Capita Income (Average, 1991-2010)	Decadal GIA/GCA Average (1991-2010)
Bilaspur	0.63	35401	4.845
Hamirpur	0.57	29214	30.17
Kangra	0.74	28512	18.76
Una	0.62	30623	10.39
Chamba	0.72	32041	27
Mandi	0.73	28189	34.54
Sirmaur	0.75	41457	16.175
Solan	0.72	63574	10.985
Kullu	0.81	34240	5.38
Shimla	0.85	41645	4.31
Kinnaur	0.84	59277	60.99
Lahaul&Spiti	0.8	72695	99.22

Analysis reveals that there exist moderate correlation (0.48) between diversification index and per capita income. This conferred to the contemporary studies, which says that diversification is leading to income increase (Sharma H. R., 2007). However, due to lack of infrastructure support to agriculture, the vice versa can also be believed. Therefore, the question whether the private infrastructure investment (Due to higher per capita income) led to diversification remains vaguely answered. To an extent, this is answered by low correlation between diversification index and decadal GIA/GCA average. Irrigation, being one of the most important agricultural infrastructure, contributes to diversification. Thus diversification is contributing towards per capita income increase. Although correlation does not give direct cause effect relationship but still diversification index's relation with higher per capita income cannot be fully ignored and it needs further deeper investigation (Table-8).

TABLE 8 : CORRELATION BETWEEN DIVERSIFICATION INDEX WITH AVERAGE PER CAPITA INCOME & DECADAL IRRIGATION AVERAGE

Particulars	Gibbs Martin Index	Per Capita Income Absolute (Average, 1993-2012)	Decadal GIA/GCA Average (1991-2010)
Gibbs Martin Index	1		
Per Capita Income Absolute (Average, 1993-2012)	0.48	1	
Decadal GIA/GCA Average (1991-2010)	0.28	0.62	1

Intensification of crops:

The cropping pattern of the state is determined by availability of technological inputs like irrigation, fertilizer input, adoption of HYV seeds, etc. Of all these inputs, irrigation forms the principal component of agricultural modernization. The study showed that the crop intensity in state are of

three types viz. high, medium and low (see table-9).

TABLE 9 : INDEX OF CROPPING INTENSITY

Types	Intensity %	Districts
High	>140	Bilaspur, Chamba, Hamirpur, Kangra, Mandi, Kullu, Sirmour, Solan& Una
Medium	130-140	Shimla
Low	<130	Kinnaur&Lahaul&/Spiti

The study reveals that high intensity of cropping (>140 Percent) was prevalent in districts like Bilaspur, Chamba, Hamirpur, Kangra, Mandi, Kullu, Sirmour, Solan& Una (Table-9). This is due to the presence of fertile soil and easy accessibility of agriculture inputs in these districts. District Shimla falls under moderate intensity of cropping (130-140 Percent) whereas Kinnaur and Lahaul and spiti fall under low intensity of cropping (<130 Percent).

Here agriculture is mainly relied on rainfall and faces many physical constraints. There has been an increase in the number of farming households in state with fragmenting and shrinking farm size and this trend would continue in future. There are three strategy options to increase the bargaining power of the small farmers in the state to attain the objective of inclusive growth. First is extensive farming – bringing more area under farming. This is difficult to implement in the state due to difficult terrain. Other option is intensive agriculture – increasing use of inputs such as land, labour, fertilizers, irrigation, etc. (Sharma V. P., 2005).

Cropping intensity index of the state reveals that nine districts of the state were showing high intensity of the cropping. This reveals the fact that among these districts, diversification and crop intensity are high. These districts fall under low hill and mid hill zones of the state, whereas districts like Shimla, Lahaul and Spiti and Kinnaur have been reflected medium and low intensity of the cropping. The reason is natural constraints and high yields from horticulture product, especially from apple. Districts Lahaul&Spiti, Kinnaur and Shimla have Intensity of the cropping below 150 percent during study period. Highest intensity of cropping has been observed in Hamirpur, Kangra, Kullu, Bilaspur and Sirmour districts.

In low hill zone, the average intensity of cropping is 187 Percent. Overall, all the zones indicate increasing trend of intensity of cropping during 1991 to 2010. Among all districts, Hamirpur has shown highest intensity of cropping. The reason is easy accessibility of resources and favourable environment for intensive cropping in the district. Moreover, the high density of the population in the districts and availability of substitution crops may be the reason for high intensification. On the other hand, district Kangra, which is the most populated district of the state, also showed significant results in intensity of cropping during 1991 to 2010. In mid hill zone, the average intensity of the cropping is 171 Percent. The unique feature of the zone is that there is no consistency in intensification as compared to low hill zone. The highest intensity of cropping in the zone is prevailing in district Sirmour. Further, the study shows that in high hill zone, which comprises of the districts Kullu and Shimla, has shown average 152 percent cropping intensity. Moreover, the result reveals that there were decreasing trends in intensity of cropping in these districts during study period.

It is evident from the above analysis that in high hill zone, farmers have preferred to grow more horticulture crops in place of field crops. This is a sign of diversification of agriculture in this zone as there is less availability of substitutes in these zone, due to natural and infrastructures constraints. The same result inferred from the analysis for cold and dry zone, where the average cropping intensity is 112 percent which is lowest among all zones. Overall, cropping intensity of the state is 163 percent, which fall under the category of highest intensity of cropping, according to cropping intensity index. High cropping intensity would not only increase the farm income of small and marginal farmer of the state, but would be helpful to achieve the inclusive growth in the region. The only need of the hour is to provide the state farmers ample help to overcome the constraints such as increasing use of inputs such as land, labour, fertilizers, irrigation, high transaction costs, problems in meeting quality standards, lack of access to markets, capital, and information by the Government.

From the forgoing discussion, it can be concluded that farmers are mostly growing field crops, such as wheat, maize, rice, pulses, etc., in the areas of higher intensity of cropping. On the other hand, intensity of cropping is low in areas mainly having horticulture crops. Analysis reveals that the trends

of diversification is highest in those zones, where intensity of cropping is low and vice-versa.Other option to increase the cropping intensity in state is technological change. However, the extensive farming and intensive are agro-economically and ecologically unsustainable in the state in long run. The only sustainable strategy for growth in agriculture is continuous technological change, which shifts the production function upwards and to the right so that it avoids getting trapped into Ricardo's law of Diminishing Returns to Scale(Desai, D'Souza, Mellor, & Sharma, 2011). Three types of policy instruments, namely, technological, economic, and institutional are needed in the state.

TABLE 10 : CROPPING INTENSITY INDEX (CII) PERCENTAGE-HIMACHAL PRADESH (1991-2010)

Zones	District	CII-1991	CII 2000	CII 2010	CII average
Low Hill and Valley areas near the plains	Hamirpur	1.95	1.92	1.93	1.93
	Kangra	1.81	1.84	1.92	1.86
	Una	1.69	1.72	1.88	1.76
	Bilaspur	1.91	1.92	1.92	1.91
	Average	1.84	1.85	1.91	1.87
Mid Hills (Sub Temperate)	Solan	1.65	1.63	1.70	1.66
	Sirmour	1.86	1.82	1.84	1.84
	Mandi	1.72	1.84	1.78	1.78
	Chamba	1.55	1.47	1.62	1.54
	Average	1.69	1.69	1.74	1.71
High Hills and Valleys in the interiors (Temperate)	Shimla	1.43	1.30	1.32	1.35
	Kullu	1.75	1.80	1.52	1.69
	Average	1.59	1.55	1.42	1.52
Cold and Dry Zone (Dry Temperate)	Kinnaur	1.20	1.23	1.15	1.19
	Lahaul/Spiti	1.07	1.03	1.06	1.05
	Average	1.13	1.13	1.10	1.12
Overall Himachal Pradesh		1.62	1.61	1.61	1.61

Trends in Net Area Sown

The net area sown represents the area sown under crops. This is the most important indicator of effective utilization of land. Low hill area has 25.9 percent net area sown of total geographical areas. On the other hand, mid and high hill zone has 16.1 percent and 10.3 percent net sown area, respectively. On the other hand, cold and dry zone has sown 0.8 percent of net sown area (Table-11). Overall, state average remains 15.8 percent of the total geographical area of net sown area. Analysis reveals that there is declining trend of net sown area in all zones. The average trend indicates that only districts Kangra and Kullu have shown increasing trend of net sown area and rest of districts have shown stagnation. Due to hilly terrain, there is very limited scope to increase the net sown area. Low hill zone observed maximum increase in this regard while minimum increase found in cold and dry zone. Overall trend reflects that the net area sown had been declining in state. Moreover, these results also signify the strong correlation between net sown area and cropping intensity. Both variables such as net sown area and cropping intensity were declining, as we move from low hill to cold and dry zone. Further, the diversification index showed high diversification in high hill and cold dry zone as compared to the low hill zone.

TABLE 11 : INDEX OF NET SOWN AREA

Types	Net Sown Area %	Districts
High	>15.5	Bilaspur, Hamirpur, Kangra, Mandi, Solan& Una
Medium	11.5-15.5	Shimla, Sirmour
Low	<11.5	Kullu, Chamba, Kinnaur & Lahaul&Spiti

The large proportion of net sown area is found in Bilaspur, Hamirpur, Kangra, Mandi, Solan and Una (Table-11). On the other hand, low proportion is found in Kullu, Chamba, Kinnaur, Lahaul and Spiti. Rest of the districts like Shimla and Sirmour are situated in between of these two extremes. Therefore, the inter-circle variation in respect of proportion of net sown area is more or less minimum. An analysis of the net sown area, extent of irrigation and cropping intensity reveals that low and mid hill zones of the state have ample scope to increase their cropping intensity as they have fairly large acreage under irrigation as compared to high hill and cold dry zones. One can have higher cropping intensity with a suitable change in cropping pattern by growing crops and varieties with durations that suit the crop growth and fit into the crop sequence. This will not only be helpful to increase the state GDP, rather it will be complementary to achieve inclusive growth in the state.

Overall net sown area in the state showed declining trends, this is due to Industrialization, urbanization and development in the state. Generally, we require more and more diversion of land to new uses for better infrastructures, but simultaneously we also need food for increasing population of the state. The productivity in the state is low as compared to other states of the country. Thus to ensure food security, better input- output ratio is the pre requisite in hilly terrain. Except districts Kangra, Kullu and Mandi there is stagnation or decreasing trend in net sown area in the state. In future, Government should place reasonable restrictions on acquisition of multi-crop irrigated land to ensure food security. Due to growth of population, land would be required for businesses fixed investment, household fixed investment and for public investment in future. To overcome this, we should increase food productivity by using modern method of production. As there will be meager chances of increasing net sown area in the state in coming days.

TABLE 12 : CO-EFFICIENT VARIATION OF AGRICULTURAL VARIABLES

Indices	Standard Deviation	Mean	Co-efficient of Variation
Percentage of Net Area Sown	10.41	15.82	65.82
Cropping Intensity	0.29	163%	17.78

Above analysis, showed there is less variation in net sown area during the period 1991-2011 in the state. It also showed the variation in net sown area was significant during the study period. Therefore, the disparity is not that acute in agriculture in the state. The coefficient of variation of proportion of cropping intensity has been computed which is as low as 17.78, indicates that the disparity is moderate.

Conclusion and Policy implications

The analysis reveals that the diversification index for the year 2009-10 in comparison to1999-2000 & 1990-1991 exhibits a decreasing trend, which is not conducive for crop diversification. The environmental constraints and natural resources are localized in few areas and technological inputs, infrastructure and facilities are very low and not uniformly distributed in all the areas. The main reasons for low crop diversification (compared to other zones) in low hill zone have been traditional emergence of wheat-rice crop rotation, low irrigation, lack of mechanization, poor infrastructure, etc. Although overall diversification in state reduced during the period but in spite of this, the diversification became more inclusive as coefficient of variation reduced. From diversification perspective, everything seems in place except the fact that in last two decades, the diversification intensity is going down in all the zones except Sirmour and Chamba as both districts were late bloomers and still known as backward districts of India. The story in terms of cropping

intensity is almost reverse, the areas, which had high diversification index, are low on cropping intensity. It can be mainly attributed to fixed horticulture apple production where only single crop is taken from land in a year. There is a large scope of crop diversification in Himachal Pradesh as the area, has have high cropping intensity, and net sown area has low diversification index. Thus areas represent sleeping giants and have huge scope for diversification in Himachal Pradesh agriculture. The government policies need to steer and motivate the diversification in low and mid hill zones. Further, the study reveals moderate correlation between diversification index and per capita average income. Thus diversification push in low and mid hill zones can further decrease the income inequalities within different agro climatic zones and can usher an era of truly inclusive & sustainable agricultural growth.

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Components of Vegetable Marketing: A Case Study in Himachal Pradesh

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Abstract

Vegetables produced in hills are marketed in the plains at a time when they are not grown there and hence, the prices they fetch are quite high in comparison to the prices received for the vegetable produced in the plains. In spite of high prices of hill vegetables, the hill farmers are not getting what they should have because the market intermediaries are earning a lot in the name of marketing cost and margins. In this paper, the estimates of marketing costs of vegetables are based on the field data for 1990-91 and 2011-12. The composition of marketing costs in important vegetables of Himachal Pradesh shows that transportation alone accounts for more than 45 percent of total marketing cost in all vegetables. However, packing and grading cost have decreased significantly over the years. The increase in total cost of production of vegetables is mainly accounted for increase in marketing costs. Except in peas, the producer's share in consumer rupee have increased from 43.53 to 60.05 percent, 46.78 to 57.59 and 44.36 to 54.31 percent, respectively for capsicum, cauliflower and tomato. The increasing rate of producer's share is mainly accounted for overall growth in price rises in national and international market. The wide difference in price received by farmers and paid by consumer suggests that a lot of money is accounted for by market operations. One of the ways suggested by vegetable growers to overcome this problem is to develop alternative agencies for the sale of vegetables so that producer's share in consumer rupee can be increased. In this regard, co-operatives offer would be the needed answer. To avoid distress sale at the time of peak harvesting seasons, the growers should be provided technical know-how on postharvest technology.

Keywords: *Marketing cost, Market intermediaries, Vegetables, Himachal Pradesh.*

Introduction

The development of vegetable industry in Himachal Pradesh has indeed been phenomenal during the past three decades. The vegetable production which was about 30,000 M.T. during 1966, increased to 3,65,000 M.T. by 1990-91 and further enhanced to 1357,000 M.T. by 2011-12. Unfortunately, post harvest technology has not kept pace with the increasing vegetable production in the State and consequently, post harvest losses between harvest and consumption are enormous. Though no definite figures are available, these losses are estimated to be anything between Rs. 5000 to Rs. 7000 crores in the State. To minimize the post harvest losses, the efficient marketing system is the only alternative to the producers of the State. The role of market technology is very important in case of vegetables and fruits which are of perishable nature. Due to their perishable nature, their produce cannot fetch reasonable prices, until efficient marketing system is developed and provided to the producers. An efficient marketing system as the farmer visualize is one which maximizes his net returns from a given transaction and helps in expanding the demand for his product.

In Himachal Pradesh, in spite of subsistence nature of farm production, vegetables are grown as cash crops. Even the smallest land holders are harnessing the agro-climatic niche for the production of vegetables in off-seasons when these are not grown in northern plains. The small land holders are supplementing their family income to the tune of 57 percent from vegetable production[1]. Vegetable produced in hills are marketed in the plains at a time when they are not grown there and hence, the prices they fetch are quite high in comparison to the prices received for the vegetable

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[1] Paul Dharam, (2013), Commercialization of Agriculture in Himachal Pradesh, Unpublished Ph.D. Thesis, Deptt. of Economics, H.P. University, Shimla.

produced. in the plains[2]. Inspite of high prices of hill vegetables, the hill farmers are not getting what they should have because the market intermediaries are earning a lot in the name of marketing cost and margins. The vegetable production in hills is an economically viable enterprise because of high prices and good demand in plains market. But most of the farmers sold their produce in the villages to local traders/markets and have not relied on the existing marketing agencies for the expected prices. Under these circumstances, if the market is not competitive in nature, the farmers failed to receive remunerative prices and market intermediaries benefited the more. Viewing the importance of vegetable enterprise in the overall economy of the State and particularly of small farmers, an attempt has been made in this paper to assess the changes in socio-economic status of vegetable growers and price spread and marketing cost of important vegetables produced in Himachal Pradesh.

Methodology

The area of the present study is confined to market oriented agricultural region of the State. The production of vegetables and fruits is considered to be main market oriented enterprises of Himachal Pradesh. In the present study, area and production of vegetables were considered for the selection of study area. Keeping in view the above, the districts selected were Solan, Shimla and Mandi. These districts were taken as the main base for selection of sample growers. Similarly, the tehsils and village/ cluster of villages were selected on the basis of probability proportional to the area under these crops. In each selected village cluster, 50 vegetable growers were selected randomly and then these growers were classified in three size groups i.e., marginal upto 1 ha., small 1-2 ha., and other above 2 ha., of operational holding. The other farm includes semi-medium, medium and large farms having more than 2 ha. of land as presented in table 1. For the year 1990-91 and 2011-12, vegetable growers were taken up for the present study (Table 1). The data for the year 1990-91was obtained from the study on Marketing of High Value Perishable Crops in Himachal Pradesh conducted by Agro-Economic Research Centre, Himachal Pradesh University Shimla. The multistage stratified random sampling method was adopted for the selection of vegetable growers. The data for 150 vegetable growers was collected by survey method for the year 1990-91.

The data for the year 2011-12 has been used from the unpublished Ph.D. work of Dr. Dharam Paul entitled "Commercialization of Agriculture in Himachal Pradesh", Department of Economics of Himachal Pradesh University, Shimla. The area of this study was also confined to same districts. In this study, from each selected cluster villages, a list of vegetable growers was prepared with the help of Patwaris of the respective village. While preparing the list, due consideration was given to those farmers who have devoted at least twenty percent and more of their net area sown was the vegetable crops for inclusion in the final list of the vegetable growers. Out of that list, 50 vegetable growers of different categories were selected randomly from each selected cluster. Since the proportions of marginal farmers are more in almost all area of the State, their numbers are more. Accordingly, due care is taken in selection of farmers to give proper weightage for different categories of vegetable growers.

Thus in all 150 and 150 vegetable growers during 1990-91 and 2011-12, respectively forms the basis of present study (Table 1). The important vegetables included in the study are peas, tomato, cauliflower and capsicum. All these vegetable account for more than 66 percent of total area devoted for vegetables cultivation.

To analyse the objectives of the study, different statistical tools have been adopted and the same are presented below:-

1. Irrigation Intensity= $\frac{Gross\ Irrigated\ Area}{Net\ Area\ Irrigated} \times 100$

2. Intensity of Cropping = $\frac{\text{Gross Cropped Area}}{\text{Net Area Sown}} \times 100$

3. Producer's Share in Consumer's Rupee= Price Received by Producer's / Farmer's Per Kilogram÷Retail Price(Consumer Price) Per Kilogram. PS=(PF÷PR)×100

4. Standard Animal Unit:
   I. Bullock, Cow, Buffalo or Horse, above two years =One Animal Unit
   II. Five Sheeps or Goats= One Animal Unit
   III. Two Young Stock, One to two Years= One Animal Unit
   IV. Four Young Stock below one year = One Animal Unit

[2] For more details see Singh, D.V.; Regional Specialization in Cultivation of Off-season vegetable on Commercial Scale: A Case of Himachal Pradesh, Agriculture Situation in India, Vol. 47, No. 12, 1993, pp. 891-895.

5. Multiple Cropping Intensity(MCI)
   MCI=a_i/A×100
   Where i=1,2,3,……n.
   n= Total no. of crops
   ai=Area occupied by crop.
   A=Total land Available for cultivation.

Results and Discussion

Socio-economic Profile: Details of socio-economic profile are given in Table 1. It reveals that during 1990-91, the family sizes as well as number of workers are positively related to the size of farms. However, during 2011-12 the same has no relation with sizes of holding. The literacy percentage is also increasing as the farm size increases. This type of trend is observed for both the reference periods. Over the reference period, the average size of operational holding for almost all categories of farms is decreasing. It was 1.28 hectares during 1990-91 and decreased to 0.95 hectare on average size of farm (Table 1). In both the reference years, the small category of farmers possesses more number of animal units (9.27 and 5.89 S.A.U.per farm) as compared to marginal and medium categories. However, numbers of animal units have significantly decreased from 7.87 S.A.U. to 4.93 SAU on average farm during the reference period (Table 1).

A remarkable change has been observed in the farm income over the reference period. The change in farm income is observed to be positively related to the size of farms. It varies from Rs. 684365 on other farms to Rs. 235895 on marginal farms and average being Rs. 380125 during 2011-12. However, during 1990-91, the average farm income was much lower i.e., in thousand with same relation (Table 1). This shows that the large land holders are getting more returns from their land base as compared to small holdings. The share of vegetable crops in total farm income is inversely related to the size of farms. And this trend remained same in both the reference periods. Also, over the reference period, the vegetables share in farm income shows increasing trend for all size of farms. On average size of farm, it was 33 percent in 1990-91 and the same has increased to 57 percent during 2011-12. All these suggest that vegetable cultivation has become popular in all categories of farms and thereby increasing their farm incomes.

Land Utilization Pattern: Land utilization pattern, presented in Table 2, reveals that proportion of cultivated land on marginal and small farms have shown more increase compared to other category of farms and overall, the proportion have increased from 40.90 to 84.07 percent. On other farm, the shave of cultivated land is lowest during 1990-91 and the same is also slight at lower level as compared to marginal and small farms in 2011-12. The share of orchard area in total holding has shown significant improvement particularly in marginal categories over the reference period. The proportion of orchard area on marginal farms has increased from 0.50 percent to 11.86 percent during 1990-2011. Similarly, for small and other farms, the acreage under orchard has shown increasing trend. The share of irrigated land in total land on all categories of farms has shown significant improvement over the years (Table 2). The overall Multiple Cropping Intensity (MCI) has improved on all categories and of farms in average, it was 145 in 1990-91 and some have increased to 164 in 2011-12. However, the MCI is inversely related to the size of farms during the reference period.

The relative vegetable cropping intensity (RVCI) has increased from 44.39 percent to 78.86 percent during the study period. The irrigation intensity has also shown increasing trend. Moreover, figures in Table 2 reveal that vegetable crops have become more popular in all categories of land holdings.

Marketing of Vegetables: Like cereals, the vegetable cannot be kept in farm for long time without proper storage. Hence, farmers have to dispose their produce after picking/harvesting as soon as possible. Due to highly perishable nature of vegetables, the marketable surplus in these crops is more as compared to cereal crops. Moreover, farmers cannot retain large quantity of vegetables for home consumption except during harvesting or picking seasons for their current consumption. Therefore, more than 96 percent of vegetables produced in Himachal Pradesh are sold in different markets as a marketed surplus. In disposal of marketed surplus, various marketing functions are performed and each function adds to the cost of the produce to the farmer as well as to consumer. All these costs involved in marketing of vegetables from Himachal Pradesh are given in Table 3.

The composition of marketing costs in important vegetables of Himachal Pradesh shows that transportation aloneaccounts for more than 42 to 46 percent of total marketing cost in all vegetables during 2011-12 and the same was slightly lower

(32 to 48 percent) during 1990-91. The packing and grading cost have not increased significantly (from 16.12 percent to 26.45 percent) over the years (Table 3) except cost of peas. The commission to market functionaries and other market fees were not increased significantly during the reference period (Table 3). For this reason, transportation costs have also increased more, i.e., 56.18 percent as compared to other vegetables. In case of tomato and cauliflower, improvement in packing and grading system reduced the packing and grading costs to the tune of 12 percent to 14 percent (Table 3). In case of tomato, packing and grading also accounts larger share in marketing of produce, it was earlier more than 50 percent and significantly higher than transportation cost.

During the reference period, it has been noticed that marketing costs as a percentage of cost of production have decreased from 35.56 to 12.40 percent in case of peas followed by capsicum (61.11 to 19.20 percent). In case of cauliflower and tomato, the marketing cost has also decreased significantly.

Price Spread in Vegetables: In marketing of commodities, the difference between the price paid by consumer and the price received by the producer for an equivalent quantity of farm produce is often known as price spread. This is also termed as marketing margins. The difference between the price received by the growers and price paid by the consumers for vegetables is compared with the cost of marketing, such as, assembling, grading, transporting, wholesaling, retailing and the margins of the market intermediaries, etc. The marketing costs also include the market charges, taxes, etc. These margins and costs are influenced by the performance or efficiency of different marketing functions and cost to the consumer. To understand the change in price ratios over the period, the details of price spread is presented in Table 4.

The figures in Table 4 reveal that the highest increase in total cost has been recorded in peas while in cauliflower, the total cost of production shows 159 percent increase during the reference period. The increase in total cost of production of all the selected vegetables is mainly accounted for increase in marketing costs. In peas, the producers share in consumer rupee have declined from 61.29 to 58.36 percent, while in other vegetables, it shows increasing trend i.e., 53.53 to 60.05 percent, 46.78 to 57.59 percent and 44.36 to 54.31 percent, respectively, for capsicum cauliflower and tomato. The increasing rate of producers share in tomato, cauliflower and capsicum is mainly accounted for overall growth in price rises in the national and international economy. Because of market competition and to maintain the post-harvest quality of products, the costs in packing and grading have increased significantly in most of the vegetables. The openings of new markets for the disposal of vegetables from Himachal Pradesh have also increased transportation cost significantly. In Himachal Pradesh, transportation has become a means of exploitation due to the perishable nature of vegetables. It is not abnormal for a farmer to pay exorbitant freight rates when the choice is limited to the high freight or complete destruction of his crop. As seen from Table 3, peas account highest share of transportation cost in total marketing cost during reference period.

The journey of each product from the farm to the ultimate consumer plays a crucial role in determining the prices to the farmer. Without any improvement in the marketing system, no incentive to increase production will attract the growers. It is more important in case of vegetables which cannot be stored for long periods on account of their perishable nature. In their case, the speed as well as efficiency of marketing operations is crucial in determining profits of the product on the one hand, the level of satisfaction of the consumer, on the other. Although the farmers are getting good prices for their produce, yet these are far behind, the prices prevailing in the market during the same period. In case of peas and capsicum during 1990-91, the difference between farmer's prices and consumer's prices were 63.15 and 229.71 percent, respectively. However, during 2011-12, except peas, the difference between farmer's prices and consumer's prices has decreased significantly (Table 4). The wide difference in price received by farmers and paid by consumer suggests that a lot of money is accounted for market operations. One of the way suggested by vegetable growers to overcome this problem is to develop alternative agencies for the sale of vegetables so that producers' share in consumer rupee can be increased. In this regard, co-operatives should offer the needed answer. To avoid distress sale at the time of peak harvesting seasons, the growers should be provided technical know-how on post-harvest technology.

TABLE 1 : SOCIO-ECONOMIC PROFILE OF SAMPLE GROWERS

	Particulars	Reference Year	Marginal Farms	Small Farms	Other Farms	All Farms
1.	No. of growers	1990-91	69	48	33	150
		2011-12	81	40	29	150
2.	Average operational holding size (Ha.)	1990-91	0.58	1.28	2.79	1.28
		2011-12	0.53	1.12	1.85	0.95
3.	Average family size	1990-91	6.43	8.52	9.73	7.83
		2011-12	6.02	5.93	6.19	6.02
4.	Average labour force (Man-equi)	1990-91	3.65	4.65	5.73	4.43
		2011-12	3.96	3.44	4.26	3.87
5.	Literacy percentage	1990-91	79.95	80.19	84.73	81.35
		2011-12	90.73	91.38	93.20	91.22
6.	Average livestock units (S.A.U.)	1990-91	6.40	9.27	8.88	7.87
		2011-12	4.17	5.89	5.78	4.93
7.	Average farm income (Rs.)	1990-91	14878	22767	31661	22673
		2011-12	235895	477668	684365	380125
8.	Share & vegetables in farm income	1990-91	37	34	27	33
		2011-12	58	57	55	57

Note: S.A.U= Standard Animal Unit.

TABLE 2 : LAND UTILIZATION PATTERN OF SAMPLE GROWERS

	Particulars	Reference Year	Marginal Farms	Small Farms	Other Farms	All Farms
1.	Total land (Ha/farm)	1990-91	1.33	3.02	7.02	3.12
		2011-12	0.59	1.36	2.31	1.13
2.	Cultivated (%)	1990-91	43.80	42.50	38.70	40.90
		2011-12	89.83	82.35	80.09	84.07
3.	Orchard Area (%)	1990-91	0.50	2.70	4.90	3.40
		2011-12	11.86	15.44	16.45	15.04
4.	Irrigated Land (%)	1990-91	20.01	15.30	9.70	13.50
		2011-12	83.05	72.79	70.56	76.11
5.	Net area shown (%)	1990-91	43.30	39.80	33.80	37.50
		2011-12	77.97	66.91	63.64	69.03
6.	M.C.I (%)	1990-91	164	148	133	145
		2011-12	172	162	158	164
7.	R.V.C.I (%)	1990-91	54.70	53.88	38.56	44.39
		2011-12	80.09	78.79	77.86	78.86
8.	Irrigation Intensity (%)	1990-91	168.52	143.65	155.37	156.04
		2011-12	246.75	189.88	215.28	225.50

MCI = Multiple Cropping Intensity
RVCI= Relative Vegetable Cropping Intensity

TABLE 3 : COMPOSITION OF MARKETING COSTS IN IMPORTANT VEGETABLES OF HIMACHAL PRADESH

(Rs./Qtl.)

	Particulars	Reference Year	Peas	Tomato	Cauliflower	Capsicum
1.	Packing and Grading costs	1990-91 2011-12	10.32 35.50	47.10 61.80	23.30 24.60	36.53 95.80
2.	Transportation Costs	1990-91 2011-12	31.10 75.40	30.50 60.80	39.45 53.80	42.90 85.90
3.	Market Commission	1990-91 2011-12	22.11 15.80	13.50 11.20	17.16 16.60	15.74 12.20
4.	Market Taxes	1990-91 2011-12	0.45 7.50	1.85 8.09	3.14 4.35	5.19 6.51
5.	Total Market Costs	1990-91 2011-12	64.00 134.20	92.95 141.89	83.05 99.35	100.36 200.41
6.	Market Cost as (%) of Cost of Production	1990-91 2011-12	35.56 12.40	54.00 19.49	49.70 15.35	61.11 19.20

TABLE 4 : PRICE SPREAD OF IMPORTANT VEGETABLES OF HIMACHAL PRADESH

(Rs./Qtl.)

	Particulars	Reference Year	Peas	Tomato	Cauliflower	Capsicum
1.	Cost of Production	1990-91 2011-12	179.98 948.22	172.13 586.11	167.10 549.02	164.23 843.47
2.	Cost of Marketing	1990-91 2011-12	64.00 134.20	92.95 141.89	83.05 99.35	100.36 200.41
3.	Total Cost	1990-91 2011-12	243.98 1082.42	265.08 728.00	250.15 648.37	264.59 1043.88
4.	Price Received by Producers	1990-91 2011-12	479.28 1612.00	311.47 1261.00	255.61 1040.00	411.75 1700.00
5.	Price paid by Consumers	1990-91 2011-12	781.98 2762.00	702.08 2322.00	546.44 1806.00	945.83 2831.00
6.	Producers share in Consumers rupee (%)	1990-91 2011-12	61.29 58.36	44.36 54.31	46.78 57.59	43.53 60.05

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Agro-Economic Research

Farmers' Suicides in Telangana*

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Having the problem of farmers' suicides in Telangana, the Directorate of Economics & Statistics, Department of Agriculture, Cooperation and Farmers Welfare, Ministry of Agriculture & Farmers Welfare, Government of India (GOI) has assigned this study to our centre with the objectives of 1) To analyse the incidence and spread of farmers' suicides in Telangana and to map the hot-spots of suicides,2) To study the socio-economic profile , cropping pattern and profitability of victim farm households, 3) To study the causes leading to farmers' suicides including production market risks, sociological, psychological and other family-related factors responsible for farmer suicides and 4) To recommend suitable policies to alleviate the incidence of farmers' suicides. The study findings, conclusions and policy measures are discussed briefly here.

Farmers' Suicides in Telangana

Telangana stands in the second position in the number of farmers' suicides in the country. The highest and more than the one-third of the farmers' suicides in the state appear in Warangal district in the study period followed by the districts of Nalgonda with 12% and Karimnagar with 10%. The lowest is reported in Nizamabad (3.67%) and Adilabad (3.99%) districts. The declared drought mandal/blocks were 11, 12 and 19 in the districts of Warangal, Nalgonda and Karimnagar, respectively, in Kharif 2015. It could be ascribed the higher level of incidence of farmer suicides to the cotton crop cultivation and the effect of continuous drought for the three preceding years of the present study year 2015-16.

Regarding one lakh ha of net sown area (NSA) and gross cropped area (GCA) and one lakh farmer families, Warangal, Nalgonda and Karaminagar are the high farmer suicide prone districts and Mahaboobnagar, Khammam, Medak and Rangareddy are the medium farmer suicide prone districts, and Nizamabad and Adilabad districts stand for the low incidence of farmer suicides in Telangana. Hence, the policy formulation could be done keeping this parameter in the fund allocation and the other remedial measures for the victim families and the support for the cultivation in the affected area.

The high farmer suicide months in Telangana are from September to December in a year. It informs the natural background of the agricultural economy with the ending and starting seasons of Kharif and Rabi, and further, it is the harvest season of Kharif. It apparently refers to the pressure of the prices of the output in the market and the indebtedness of the farmer through the helm of affairs of the cultivation. The concerned authorities did not sanction the compensation amount in pro rata of the farmers' suicides occurred in the district in question. The district wise authorised amounts prove this lacuna, as the Karimnagar district got 22% followed by the districts of Nalgonda with 18% and Warangal with 15%. Warangal district bears one-third of the brunt of the suicide burden of the state followed by Nalgonda district. It could be changed through the policy of pro rata and weight of the incidence of the farmers' suicides in the nine districts of Telangana.

Socio-economic Profile of Victims and their families in the Study Area:

The sample of victims is 50 from the selected districts of Medak and Warangal in Telangana. Most of them have wives, sons, and daughters since the respondents are 94% from this category. The farmers' suicides are much affected in the weaker sections of the society. The victims were 62% illiterates, and this had been dominating the risky decisions of the farmers. If the family encumbrances are observed, they did not have the brunt of the burden from the parents and siblings. They were neither hiding nor leaving their places with cowardice.

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The current household size (3.28) divulges the planned families. Either the families or the victims have good contacts and socialisation. All the farmers' suicides are from the lower landholding sizes with the average size of 2.24 acres and with the absence of the uncultivated area and the cropping intensity.

The sources of irrigation account the vulnerability of the farmer in the cultivation in the selected districts of Telangana. The income sources of households of victims divulge that the significant share (35%) comes from agriculture followed by agriculture wage income (32%). The agriculture and allied activities have given the share of 70% in the net income, and it is less than its expenditure. The total expenditure is Rs.0.44 lakhs, and total income is Rs.0.41 lakhs. There was a 6% of a deficit in net income of the household compared to its spending in 2015-16.

The borewell irrigation is predominant and meeting with a lot of expense to the farmer, and the many numbers of failures are encountered to have a borewell on the farm. It is noticed the dominance of cash crop cotton in the cropping pattern of the sample households, who hailed from the majority of the 'Other Backward Castes'(OBCs). There has been a lot of frustration and despair in the peasant community of their profession and its success. The lifestyle of the farmer has changed due to several factors viz. financial conditions, labour availability, inputs' prices and its quality, volatile and exploitative markets and ever-increasing prices against the backdrop of the augmented cost of cultivation.

Causes of Farmers' Suicides in Study area

The poverty has the most influencing factor, as farmers come under lower landholding sizes and expressed its influence at the highest by 86%. The farming related causes of suicides reflect heavily on the failure of crops and the lack of access to irrigation with the influence of 96% over the suicides. The 'natural calamities', and the 'failure of rainfall/ drought' are viewed 100% causative ones, and the failure of finding a borewell on the farm has been leading to massive indebtedness to the marginal and small farmers. The 'Higher output' and the 'Higher prices' report 88% of the influence on the incidence of suicides.

There is a considerable view of the impact of family problems/commitments over the frequency of suicides. The 'drug abuse/alcoholic addiction' aspect has the influence at 22%. The farming related causes of suicides point out the 'lack of access to irrigation', and it reports 96% in both 2014-15 and 2015-16 years followed by 'other factors' with 20%. 'Property disputes' and 'marriage related issues' are not much active, whereas the 'family problems/ commitments' and 'drug abuse/alcoholic addiction' have a little stimulating. The 'social functions' turned to be the burdensome, while the 'frequent quarrel among the family members' happened due to the consequence of the financial crisis in the families. The fall in 'social reputation' becomes the derived cause of the indebtedness of the farmer in the society recently. The pressure from non-institutional sources, mainly from moneylenders is viewed 84% in both study years followed by a non-agricultural loan. It implies the level of quandary linked with financial relations of the victims in the study area. With the dominance of the non-institutional credit, the outstanding amount per household was reported by non-institutional sources with 89% and institutional sources with 11% of the marginal and small farmer landholding sizes.The non-institutional credit dominates the scenario of the total credit. The total outstanding amount is Rs.3.63 lakhs per household from all the sources of credit. Many sources show 24% interest rate per annum. The remittance took at 18% of the households, and out of it, 16% of instalment appeared to only moneylenders.

There is the higher influence of the 'insecurity in the family' followed by 'no earning member' and 'agricultural activities stopped' and the 'schooling of children stopped' reported at the lower level. The factors like 'family member's depression' and family member's illness have appeared. The ranking of the households shows that poverty has the first rank followed by 'family problems/commitments with second place and 'drug abuse/alcoholic addiction with a third position. In debt related causes, 'due to pressure from non-institutional sources-mainly money lenders' is recorded as the first one followed by the 'indebtedness-institutional & non-institutional with a second place, whereas 'due to pressure from institutional sources' is ranked as the third one.

There are suggestions from the victim families to prevent the suicides in future through-established irrigation, developing dairy and the better

alternative income sources. It is further requested for the low rate of interest to the given investment to the farmers either in farming or in allied activities to come out from the clutches of the non-institutional sources and for the higher prices to the agricultural produce. There is a demand for 'free of cost of digging borewells' by the government. There is a need for the support of tenant farmers through the low rate of interest to various loans to relieve them from the debt burden of the non-institutional sources.

Conclusions

Having the second position among the states, Telangana has the highest farmers' suicides in Warangal district with the one-third share of the state followed by Nalgonda and Karimnagar districts, though the other districts have the menace. The much incidence of suicide appears from September to December in a year across Telangana.

The compensation was not sanctioned in the pro rata of the suicides of the district in question rather approved routinely. It could be changed through the policy of pro rata and the weight of incidence of farmers' suicides in the nine districts of Telangana.

With a deficit of 6% income to the total household expenditure, the sample households have lower incomes with the sharing of income per household from agriculture, wage income and 'pensions and salaries' with 35%, 32% and 27%, respectively since the most of the cultivation is rainfed along with very limited area with well (open/borewell) irrigation.

The borewell operation led to high indebtedness to the farmer due to its failures. It is noticed the dominance of cash crop cotton in the cropping pattern of the sample households, who hailed from the majority of the OBCs. Further, all the households were from marginal and small farmer landholding groups with the above 60% illiterates and with a planned family (3.28 members) in study districts in Telangana.

With the dominance of the non-institutional credit over the victim families, the outstanding amount was reported by non-institutional sources with 89% and institutional sources with 11% of the marginal and small farmer landholding sizes (2.24 acres per household). The instalment remittance took place from 18% of households, and out of these households, the 16% of households remitted the instalment as per the schedule to the non-institutional sources.

There has been a lot of frustration and despair in the peasant community of their profession and its success. The lifestyle has changed in the farmer due to several factors-financial conditions, labour availability, inputs' prices and its quality, volatile and exploitative markets against the backdrop of the augmented cost of cultivation.

The poverty has the most influencing factor, as the farmers come under lower landholding sizes and expressed its influence at the highest by 86%. 'Property disputes' and 'marriage related issues' are not much active, whereas 'family problems/commitments' and 'drug abuse/alcoholic addiction' have a little stimulating. The 'social functions' turned to be the burdensome in recent past, while the 'frequent quarrel among the family members' happened due to the consequence of the financial crisis in the families. The fall in 'social reputation' becomes the derived cause of the indebtedness of the farmer in the society recently.

The farming related causes of suicides reflect heavily on the failure of crops and the lack of access to irrigation with the influence of 96% over the suicides in the present study area. The 'natural calamities', and the 'failure of rainfall/drought' are viewed 100% contributory ones, and the failure of finding a borewell on the farm has been leading to heavy indebtedness to the marginal and small farmers. The 'Higher output' and the 'Higher prices' report 88% of the influence on the incidence of suicides.

Out all the causes, the primary factor of the quandary is the indebtedness over the impact on the farmers' suicides with a variation of institutional credit with 26% and the non-institutional credit with 88%. There is the higher influence of the 'insecurity in the family' followed by 'no earning member' and 'agricultural activities stopped', and the 'schooling of children stopped' reported at the lower level. The factors, namely, 'family member's depression', and family member's illness have appeared.

Policy Measures

Proper Marketing System and Marginal and Small Farmers

It is to be taken place in every village, for example, the production of the farmer of the cotton crop is purchased at the few agricultural market centres rather than at the village level by the Cotton Corporation of India (CCI). The harvesting season is to be supported through the purchases of agricultural marketing committees. Otherwise, some other governmental body may be assigned to make the buying of the production of the farmer at the village level. 'Commodity Supply Credit System' may be introduced, and it will be done based on the selling of the commodity of the farmer to the purchasing body of the government. How much commodity sold by a farmer may be recorded, and the payment of the amount of the sold merchandise may be deposited in the farmer's bank account, where he can take a crop a loan or a land development loan. To realise the level of cultivated area of a farmer, this will facilitate and authorise the bank to give loans to farmers including tenants based on the undergone cultivated area/the sold produce in the village.

Extension of Institutional Credit could be done through the converting of the present 'Business Agents'/'Correspondent' into 'the village single window banking employee' to do all the institutional banking works of a village. There is to be an extension of institutional credit level without the consideration of the collateral property of the tenant and the marginal and small farmers, and the commercial and the rural banks may fix/sanction the quantum of credit to them basing on the area cultivated in the village or the level of produce, as per the purchase record of the agricultural market body of the village in question.

Mandal/block level Farm and Non-Farm Employment Development Cell is to be started to extend employment in the allied activities of agriculture and the non-agriculture. It should finance and guide the small and tiny ventures in the villages. It may be integrated with all the employment generating departments and agencies across state and nation. It should be a mentor to the farmers for starting allied agricultural and non-agricultural ventures.

Borewell Irrigation Development should be a special provision for the farmer to have a borewell on his farm if the farmer wants to have for his cultivation. To this end, the ground water storage and the other environmental precautions may be taken care of by the government. For this purpose, an authority may be launched in Telangana for weaker sections for doing all this job at the village level with a proper allotment of funds from both state and central governments, as in the case of watersheds in villages. Although for the borewell purpose, there is an organisation in Telangana, its activity is absent in support of marginal and small farmers.

Village level Secular Personality Counselling Centres could be the source of inspiration to the villagers in general and in particular for the farmers. With the support of some non-governmental organisations (NGOs) like the Ramakrishna Mission, Mata Amruthananda Mai, Isha Foundation, etc., the 'Secular Personality Counselling Centres' may be started in the rural Telangana. These centres should give the secular, scientific and spiritual counselling for the betterment of the personality and in performing the real activity. The counselling may be monthly or quarterly to the farmers. These should stand as the harbingers for a better life in the rural Telangana.

Other Measures: (i) In the districts of high incidence of suicides, a pilot programme of single window system for institutional loans, inputs and marketing could be made on trial/temporary basis. It will facilitate and relieve the farmer from all the delayed procedures and the malpractices of the market for the inputs purchase and the farmer's output selling. (ii) In the post-suicide redressal operations, the panchayat's role is to be enhanced. The exgratia payment may be accounted for in the bank immediately. There is an urgent need for the better role of extension services for the better relief either in cultivation or in other allied activities of the victim families.

COMMODITY REVIEWS

Foodgrains

During the month of February, 2018, the Wholesale Price Index (Base 2011-12=100) of foodgrains and pulses decreased by (-) 0.36 percent and (-) 2.36 percent, respectively, whereas the prices of cereals remained constant as compared to January, 2018 .

All India Index Number of Wholesale Prices

(Base Year 2011-2012=100)

Commodity	Weight (%)	WPI for the Month of February 2018	WPI for the Month of January 2018	WPI A year ago	Percentage change during	
					A month	A year
1	2	3	4	5	6	7
Paddy	1.43	151.2	150.4	146.4	0.53	3.28
Wheat	1.028	140.8	140.8	149.3	0.00	-5.69
Jowar	0.067	115.9	118.3	136.0	-2.03	-14.78
Bajra	0.086	127.9	131.7	151.3	-2.89	-15.47
Maize	0.189	117.3	116.4	135.6	0.77	-13.50
Barley	0.014	141.0	141.6	161.9	-0.42	-12.91
Ragi	0.007	214.9	207.9	142.9	3.37	50.38
Cereals	2.824	143.4	143.4	147.0	0.00	-2.45
Pulses	0.639	124.1	127.1	164.4	-2.36	-24.51
Foodgrains	3.465	139.9	140.4	150.2	-0.36	-6.86

Source Office of the Economic Adviser, DIPP.

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

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

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

Procurement of Rice

The total procurement of rice in the current marketing season i.e., 2017-2018, up to 28.02.2018 stood at 30.07 million tonnes, as against 30.25 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 2018-19 (upto 28.02.2018)		Corresponding Period of last Year 2017-18		Marketing Year (October-September) 2016-17		2015-16	
	Procurement	%age to Total	Procurement	%age to Total	Procurement	%age to Total	Procurement	%age to Total
1	2	3	4	5	6	7	8	9
Andhra Pradesh	2521	8.38	2342	7.79	3725	9.78	4326	12.65
Chhatisgarh	3206	10.66	4662	15.50	4022	10.56	3442	10.06
Haryana	3966	13.19	3570	11.87	3583	9.40	2861	8.36
Maharashtra	146	0.49	214	0.71	309	0.82	230	0.67
Punjab	11832	39.34	11044	36.72	11052	29.00	9350	27.33
Tamil Nadu	199	0.66	64	0.21	144	0.38	1191	3.48
Uttar Pradesh	2857	9.50	2039	6.78	2354	6.18	2910	8.50
Uttarakhand	37	0.12	648	2.15	706	1.85	598	1.75
Others	5309	17.65	5666	18.84	12210	32.04	9301	27.19
Total	30073	100.00	30249	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., 2017-2018 up to 31st August, 2017 is 30.83 million tonnes against 22.96 million tonnes of wheat procured, during the corresponding period of last year. The details are given in the following table :

PROCUREMENT OF WHEAT

State	Marketing Season 2017-18 (upto 31.08.2017)		Corresponding Period of last Year 2016-17		Marketing Year 2016-17		(April-March) 2015-16	
	Procurement	%age to Total	Procurement	%age to Total	Procurement	%age to Total	Procurement	%age to Total
1	2	3	4	5	6	7	8	9
Haryana	7432	24.11	6752	29.41	6722	29.32	6778	24.13
Madhya Pradesh	6725	21.82	3992	17.39	3990	17.40	7309	26.02
Punjab	11706	37.98	10649	46.38	10645	46.42	10344	36.83
Rajasthan	1245	4.04	762	3.32	762	3.32	1300	4.63
Uttar Pradesh	3699	12.00	797	3.47	802	3.50	2267	8.07
Others	18	0.06	10	0.04	9	0.04	90	0.32
Total	30825	100.00	22962	100.00	22930	100.00	28088	100.00

Source: Department of Food & Public Distribution.

Commercial Crops

Oil Seeds

The Wholesale Price Index (WPI) of nine major oilseeds as a group stood at 138.2 in February, 2018 showing an increase of 4.1% and decrease of 34.5% over the previous month and year respectively. The WPI of groundnut seed increased by 1.3%, ,gingelly seed (sesamum) by 0.9%, safflower (kardi seed) by 0.3%, sunflower by 0.8% and soyabean by 11.4%. The WPI of rape & mustard seed decreased by 0.6%, cotton seed by 1%, copra (coconut) by 0.5%, and niger seed by 5.3%.

Manufacture of Vegetable and Animal Oils and Fats

The WPI of manufacture of vegetable and animal oils and fats as a group stood at 112.9 in February, 2018 showing an increase of 0.4% and decrease of 28.4% over the previous month and year respectively. The WPI of mustard oil increased by 0.2%, soyabean oil by 0.5%, sunflower oil by 0.5%, groundnut oil by 1.2% and cotton seed oil by 2.1%. The WPI of rapeseed oil decreased by 1.1% and copra oil by 1.6%.

Fruits & Vegetable

The WPI of fruits & vegetable as a group stood at 133.4 in February, 2018 showing a decrease of 8.6% and 42.2% over the previous month and year respectively.

Potato

The WPI of potato stood at 108.1 in February, 2018 showing a decrease of 3% over the previous month and a decrease of 21.2% over the previous year.

Onion

The WPI of onion stood at 250.7 in February, 2018 showing a decrease of 27.6% and 0.3% over the previous month and year respectively.

Condiments & Spices

The WPI of condiments & spices (group) stood at 131.7 in February , 2018 showing an increase of 0.8.% over the previous month and a decrease of 60.6% over the year. The WPI of chillies (dry) increased by 4.1% and that of black pepper and turmeric decreased by 1% and 0.4%.

Raw Cotton

The WPI of raw cotton stood at 106.9 in February, 2018 showing a decrease of 3.3% over the previous month and a decrease of 55.5 % over the year.

Raw Jute

The WPI of raw jute stood at 166.8 in February, 2018 showing an increase of 4.6% and a decrease of 58.7% over the previous month and year respectively.

Wholesale Price Index of Commercial Crops

Commodity	Latest	Month	Year	% Variation Over	
	Jan, 2018	Dec, 2017	Jan, 2017	Month	Year
Oil Seeds	132.7	129.2	211.3	2.7	-37.2
Groundnut Seed	113.4	113.8	251.3	-0.4	-54.9
Rape & Mustard Seed	137.6	138.2	230.6	-0.4	-40.3
Cotton Seed	143.4	144.8	222.8	-1.0	-35.6
Copra (Coconut)	215.5	210.1	139.6	2.6	54.4
Gingelly Seed (Sesamum)	132.2	128.3	305.3	3.0	-56.7
Niger Seed	200.8	203	314.5	-1.1	-36.2
Safflower (Kardi Seed)	138.8	133.2	164.3	4.2	-15.5
Sunflower	99.8	100.2	171.1	-0.4	-41.7
Soyabean	136.6	125.3	178.1	9.0	-23.3
Manufacture of vegetable and animal oils and fats	112.4	111.2	111.0	1.1	1.3
Mustard Oil	120.4	120.9	125.8	-0.4	-4.3
Soyabean Oil	110.7	105.9	162.3	4.5	-31.8
Sunflower Oil	105.8	104.1	133.4	1.6	-20.7
Groundnut Oil	104.3	105.9	213.0	-1.5	-51.0
Rapeseed Oil	112.1	111.7	115.8	0.4	-3.2
Copra oil	179.2	178.1	142.2	0.6	26.0
Cotton seed Oil	103.6	102.4	204.5	1.2	-49.3
Fruits & Vegetables	146	162.2	220.3	-10.0	-33.7
Potato	111.4	117.7	151.2	-5.4	-26.3
Onion	346.2	363	252.4	-4.6	37.2
Condiments & Spices	130.7	128.2	357.4	2.0	-63.4
Black Pepper	154.6	154.4	726.7	0.1	-78.7
Chillies (Dry)	120.8	116.7	397.6	3.5	-69.6
Turmeric	125.5	128.3	240.9	-2.2	-47.9
Raw Cotton	110.6	107.6	234.3	2.8	-52.8
Raw Jute	159.5	154.4	403.4	3.3	-60.5

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	Oct, 17	8	NA	200	500	NA	250	NA	500	400	NA
	Guntur	Tadikonda	Oct, 17	8	300	275	325	NA	275	NA	NA	NA	NA
Telangana	Ranga Reddy	Arutala	Dec, 17	8	615	260	425	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	Feb, 18	8	300	150	300	150	200	NA	250	200	150
Jharkhand	Ranchi	Gaitalsood	June, 17	8	229	229	229	229	229	229	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	Oct, 17	M	8	NA	170	NA	170	150	175	300	200	200
				W	8	NA	150	NA	150	130	NA	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.*

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	Oct,17	M	8	NA	NA	NA	NA	NA	NA	NA	NA	NA
				W	8	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Satna	Kotar	Oct,17	M	8	200	200	200	200	200	200	300	300	300
				W	8	NA	200	200	200	200	200	NA	NA	NA
	Shyopurkala	Vijaypur	Oct,17	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	Sep,17	M	8	350	350	350	350	350	350	450	300	350
				W	8	NA	200	350	250	250	250	NA	NA	NA
	Ganjam	Aska	Sep, 17	M	8	300	250	250	350	350	250	500	400	300
				W	8	NA	200	250	250	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	Dec, 17	M	8	NA	NA	400	NA	NA	500	700	500	NA
				W	8	NA	NA	NA	NA	NA	NA	NA	300	NA
	Jalore	Sarnau	Dec, 17	M	8	NA	NA	300	NA	NA	NA	350	300	NA
				W	8	NA	NA	NA	300	NA	NA	NA	300	NA
Tamil Nadu*	Thanjavur	Pulvarnatham	Oct, 17	M	8	NA	354	NA	346	371	NA	475	338	350
				W	8	NA	150	141	136	137	NA	NA	NA	NA
	Tirunelveli	Malayakulam	Oct, 17	M	8	NA	250	NA	400	366	NA	NA	NA	NA
				W	8	NA	183	173	245	NA	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. Month End Wholesale Prices of Certain Agricultural Commodities and Animal Husbandry Products at Selected Centres in India

Commodity	Variety	Unit	State	Centre	Feb-18	Jan-18	Feb-17
Wheat	PBW 343	Quintal	Punjab	Amritsar	1665	1690	1800
Wheat	Dara	Quintal	Uttar Pradesh	Chandausi	1630	1660	1825
Wheat	Lokvan	Quintal	Madhya Pradesh	Bhopal	1740	1648	1872
Jowar	-	Quintal	Maharashtra	Mumbai	2500	2300	2200
Gram	No III	Quintal	Madhya Pradesh	Sehore	3690	3352	4476
Maize	Yellow	Quintal	Uttar Pradesh	Kanpur	1355	1380	1350
Gram Split	-	Quintal	Bihar	Patna	6300	6400	13000
Gram Split	-	Quintal	Maharashtra	Mumbai	5200	5600	7600
Arhar Split	-	Quintal	Bihar	Patna	6500	6500	9200
Arhar Split	-	Quintal	Maharashtra	Mumbai	5600	5300	6200
Arhar Split	-	Quintal	NCT of Delhi	Delhi	5300	5520	6450
Arhar Split	Sort II	Quintal	Tamil Nadu	Chennai	5500	5500	7000
Gur	-	Quintal	Maharashtra	Mumbai	4200	3900	3850
Gur	Sort II	Quintal	Tamil Nadu	Coimbatore	4600	5200	4300
Gur	Balti	Quintal	Uttar Pradesh	Hapur	2400	2500	2720
Mustard Seed	Black (S)	Quintal	Uttar Pradesh	Kanpur	3600	3700	4175
Mustard Seed	Black	Quintal	West Bengal	Raniganj	4200	4200	4500
Mustard Seed	-	Quintal	West Bengal	Kolkata	4200	4200	3800
Linseed	Bada Dana	Quintal	Uttar Pradesh	Kanpur	4540	4600	5500
Linseed	Small	Quintal	Uttar Pradesh	Varanasi	4500	4600	4900
Cotton Seed	Mixed	Quintal	Tamil Nadu	Virudhunagar	1750	1750	2300
Cotton Seed	MCU 5	Quintal	Tamil Nadu	Coimbatore	2560	2560	2750
Castor Seed	-	Quintal	Telangana	Hyderabad	4050	3900	3450
Sesamum Seed	White	Quintal	Uttar Pradesh	Varanasi	7270	6700	7770
Copra	FAQ	Quintal	Kerala	Alleppey	13200	13250	8300
Groundnut	Pods	Quintal	Tamil Nadu	Coimbatore	5300	5300	5500
Groundnut	-	Quintal	Maharashtra	Mumbai	5200	5050	6200
Mustard Oil	-	15 Kg.	Uttar Pradesh	Kanpur	1345	1330	1365
Mustard Oil	Ordinary	15 Kg.	West Bengal	Kolkata	1400	1390	1475
Groundnut Oil	-	15 Kg.	Maharashtra	Mumbai	1350	1400	1470
Groundnut Oil	Ordinary	15 Kg.	Tamil Nadu	Chennai	1720	1710	1860

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

Commodity	Variety	Unit	State	Centre	Feb-18	Jan-18	Feb-17
Linseed Oil	-	15 Kg.	Uttar Pradesh	Kanpur	1425	1425	1440
Castor Oil	-	15 Kg.	Telangana	Hyderabad	1350	1320	1200
Sesamum Oil	-	15 Kg.	NCT of Delhi	Delhi	1550	1550	1515
Sesamum Oil	Ordinary	15 Kg.	Tamil Nadu	Chennai	2100	2100	2200
Coconut Oil	-	15 Kg.	Kerala	Cochin	3135	2880	1845
Mustard Cake	-	Quintal	Uttar Pradesh	Kanpur	1820	1830	2325
Groundnut Cake	-	Quintal	Telangana	Hyderabad	3000	2536	3000
Cotton/Kapas	NH 44	Quintal	Andhra Pradesh	Nandyal	4500	5000	5350
Cotton/Kapas	LRA	Quintal	Tamil Nadu	Virudhunagar	4500	4600	5200
Jute Raw	TD 5	Quintal	West Bengal	Kolkata	3975	3850	3810
Jute Raw	W 5	Quintal	West Bengal	Kolkata	4025	3900	3860
Oranges	-	100 No	NCT of Delhi	Delhi	667	667	542
Oranges	Big	100 No	Tamil Nadu	Chennai	600	NA	550
Banana	-	100 No.	NCT of Delhi	Delhi	417	500	350
Banana	Medium	100 No.	Tamil Nadu	Kodaikkanal	670	660	501
Cashewnuts	Raw	Quintal	Maharashtra	Mumbai	100000	100000	80000
Almonds	-	Quintal	Maharashtra	Mumbai	72000	72000	70000
Walnuts	-	Quintal	Maharashtra	Mumbai	75000	75000	95000
Kishmish	-	Quintal	Maharashtra	Mumbai	18000	18000	11000
Peas Green	-	Quintal	Maharashtra	Mumbai	2600	2700	3250
Tomato	Ripe	Quintal	Uttar Pradesh	Kanpur	680	1100	475
Ladyfinger	-	Quintal	Tamil Nadu	Chennai	2000	1700	4000
Cauliflower	-	100 No.	Tamil Nadu	Chennai	1300	2000	1500
Potato	Red	Quintal	Bihar	Patna	810	810	1000
Potato	Desi	Quintal	West Bengal	Kolkata	600	540	380
Potato	Sort I	Quintal	Tamil Nadu	Mettuppalayam	1683	2120	1793
Onion	Pole	Quintal	Maharashtra	Nashik	1400	2850	500
Turmeric	Nadan	Quintal	Kerala	Cochin	13500	14500	15000
Turmeric	Salam	Quintal	Tamil Nadu	Chennai	11500	11500	8600
Chillies	-	Quintal	Bihar	Patna	11000	11200	8000

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

Commodity	Variety	Unit	State	Centre	Feb-18	Jan-18	Feb-17
Black Pepper	Nadan	Quintal	Kerala	Kozhikode	38000	38000	55000
Ginger	Dry	Quintal	Kerala	Cochin	13000	13500	14000
Cardamom	Major	Quintal	NCT of Delhi	Delhi	80000	85000	125000
Cardamom	Small	Quintal	West Bengal	Kolkata	105000	110000	140000
Milk	Buffalo	100 Liters	West Bengal	Kolkata	5200	5200	3800
Ghee Deshi	Deshi No 1	Quintal	NCT of Delhi	Delhi	73370	73370	36685
Ghee Deshi	-	Quintal	Maharashtra	Mumbai	46000	46000	46000
Ghee Deshi	Desi	Quintal	Uttar Pradesh	Kanpur	39500	39400	37000
Fish	Rohu	Quintal	NCT of Delhi	Delhi	13000	13000	14500
Fish	Pomphrets	Quintal	Tamil Nadu	Chennai	35000	36000	33000
Eggs	Madras	1000 No.	West Bengal	Kolkata	4500	5000	4000
Tea	-	Quintal	Bihar	Patna	21300	21300	21250
Tea	Atti Kunna	Quintal	Tamil Nadu	Coimbatore	38000	38000	35000
Coffee	Plant-A	Quintal	Tamil Nadu	Coimbatore	22000	24000	26000
Coffee	Rubusta	Quintal	Tamil Nadu	Coimbatore	13500	14000	17500
Tobacco	Kampila	Quintal	Uttar Pradesh	Farukhabad	4050	3850	4500
Tobacco	Raisa	Quintal	Uttar Pradesh	Farukhabad	2350	2260	3500
Tobacco	Bidi Tobacco	Quintal	West Bengal	Kolkata	14200	14800	13800
Rubber	-	Quintal	Kerala	Kottayam	11400	10900	13000
Arecanut	Pheton	Quintal	Tamil Nadu	Chennai	54000	52000	32700

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

Commodity	Variety	Country	Centre	Unit	JAN	FEB
CARDAMOM	Guatmala Bold Green	U.K.	-	Dollar/MT	18500	19500
				Rs./Qtl	117642	126477
CASHEW KERNELS	Spot U.K. 320s	U.K.	-	Dollar/MT	11535	11346
				Rs./Qtl	73351	73593
CASTOR OIL	Any Origin ex tank Rotterdam	Netherlands	-	Dollar/MT	1612	1652
				Rs./Qtl	10251	10716
CHILLIES	Birds eye 2005 crop	Africa	-	Dollar/MT	5800	4800
				Rs./Qtl	36882	31133
CLOVES	Singapore	Madagascar	-	Dollar/MT	7900	8100
				Rs./Qtl	50236	52537
COCONUT OIL	Crude Phillipine/Indonesia, cif Rotterdam	Netherlands	-	Dollar/MT	1365	1260
				Rs./Qtl	8680	8172
COPRA	Phillipines cif Rotterdam	Phillipine	-	Dollar/MT	769	716
				Rs./Qtl	4890	4644
CORRIANDER		India	-	Dollar/MT	1650	1650
				Rs./Qtl	10492	10702
CUMMIN SEED		India	-	Dollar/MT	3300	3300
				Rs./Qtl	20985	21404
MAIZE		U.S.A.	Chicago	C/56 lbs	355	367
				Rs./Qtl	887	935
OATS		CANADA	Winnipeg	Dollar/MT	340	327
				Rs./Qtl	2164	2123
PALM KERNAL OIL	Crude Malaysia/Indonesia, cif Rotterdam	Netherlands	-	Dollar/MT	1255	1140
				Rs./Qtl	7981	7394
PALM OIL	Crude Malaysian/Sumatra, cif Rotterdam	Netherlands	-	Dollar/MT	685	663
				Rs./Qtl	4356	4297
PEPPER (Black)	Sarawak Black lable	Malaysia	-	Dollar/MT	5000	5000
				Rs./Qtl	31795	32430
RAPESEED	Canola	CANADA	Winnipeg	Can Dollar/MT	485	511
				Rs./Qtl	2500	2610
	UK delivered rapeseed, delivered Erith(buyer)	U.K.	-	Pound/MT	275	276
				Rs./Qtl	2482	2500
RAPESEED OIL	Refined bleached and deodorised ex-tanks,broker price	U.K.	-	Pound/MT	669	697
				Rs./Qtl	6039	6313
SOYABEAN MEAL	UK produced 49% oil & protein ('hi-pro') ex-mill seaforth UK bulk	U.K.	-	Pound/MT	305	337
				Rs./Qtl	2753	3053
SOYABEAN OIL		U.S.A.	-	C/lbs	33	32
				Rs./Qtl	4625	4574

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

Commodity	Variety	Country	Centre	Unit	JAN	FEB
SOYABEANS	Refined bleached and deodorised ex-tanks,broker price	U.K.	-	Pound/MT	651	657
				Rs./Qtl	5877	5951
		U.S.A.	-	C/60 lbs	941	1032
				Rs./Qtl	2196	2457
	US NO.2 yellow	Netherlands	Chicago	Dollar/MT	385	423
				Rs./Qtl	2451	2744
SUNFLOWER SEED OIL	Refined bleached and deodorised ex-tanks,broker price	U.K.	-	Pound/MT	724	727
				Rs./Qtl	6536	6585
Wheat		U.S.A.	Chicago	C/60 lbs	435	451
				Rs./Qtl	1015	1074

Source - Public Ledger

FOREIAN EXCHANAE RATES

Currency	JAN	FEB
CanDollar	51.57	51.11
UKPound	90.27	90.58
USDollar	63.59	64.86

Crop Production

SOWING AND HARVESTING OPERATIONS NORMALLY IN PROGRESS DURING MAY, 2018

State	Sowing	Harvesting
(1)	(2)	(3)
Andhra Pradesh	Autumn Rice, Sugarcane, Groundnut	Summer Rice, Onion.
Assam	Winter Rice, Maize, Tur (R), Cotton.	Summer Potato (Hills).
Bihar	Autumn Rice, Jute, Mesta. Castoresed.	Summer Rice, Wheat, Barley, Gram. Linseed.
Gujarat	Sugarcane, Ginger, Turmeric.	Onion
Himachal Pradesh	Maize, Ragi, Small Millets (K), Summer Potato (Hills), Sugarcane, Ginger, Chillies (Dry), Tobacco, Sesamum, Cotton, Turmeric.	Wheat, Barley, Gram, Other Rabi Pulses, Linseed, Onion.
Jammu & Kashmir	Autumn Rice, Jowar (K), Maize, Ragi, Small, Millets (K), Mung (K), Tur (K), Other Tobacco, Sannhemp.	Wheat, Barley, Small Millets (R) Tur (K). Sesamum, Rapeseed and Mustard, Linseed. Onion.
Karnataka	Autumn Rice, Jowar (K), Maize, Ragi, Urad (K), Mung (K), Summer Potato (Hills), Tobacco, Castorseed, Sesamum, Cotton, Sweet Potato, Turmeric, Sannhemp, Onion, Tapioca.	Summer Rice, Ragi (R), Winter Potato (Plain), Tapioca.
Kerala	Autumn Rice, Ragi, Small Millets (K), Tur (K), Urad (K), Mung (K), Other Kharif Pulses, Ginger, Turmeric, Tapioca (Early).	Summer Rice, Other Rabi Pulses. Tapioca (Late).
Madhya Pradesh	Sugarcane, Ginger, Chillies (Dry), Turmeric.	Winter Potato (Plains), Onion.
Maharashtra	Termeric.	–
Manipur	Autumn Rice, Groundnut, Castorseed, Cotton, Turmeric.	–
Orissa	Autumn Rice, Sugarcane, Chillies (Dry), Jute.	Summer Rice, Cotton, Chillies (Dry).
Punjab and Haryana	Autumn Rice, Summer Rice, Ragi, Small Millets (K), Tur (K), Summer Potato (Hills) Chillies (Dry), Cotton, Sweet Potato.	Wheat, Barley, Winter Potato (Plains) Summer Potato, Tabacco, Onion.
Rajsthan	Sugarcane	Wheat, Small Millets (R), Tabacco.

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

State	Sowing	Harvesting
(1)	(2)	(3)
Tamil Nadu	Autumn Rice, Bajra, Summer Potato, Sugarcane, Chillies (Dry), Groundnut, Turmeric, Sannhemp. Tapioca	Summer Rice, Jowar (R), Winter Potato (Hills), Sugarcane, Chillies (Dry). Sesamum, Onion.
Tripura	Autumn Rice, Maize, Sugarcane, Ginger, Chillies (Dry), Seasmum, Cotton, Jute, Mesta.	–
Uttar Pradesh	Autumn Rice, Tur (K), Chillies (Dry), Groundnut, Cotton, Jute, Mesta, Linseed.	Summer Rice, Wheat, Barley, Sugarcane, Tabacco, Rapeseed and Mustard, Sannhemp, Onion.
West Bengal	Autumn Rice, Winter Rice, Tur (K), Ginger, Chillies (Dry), Jute, Mesta.	Summer Rice Chillies (Dry). Sesamum.
Delhi	Jowar (K), Onion.	

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