AGRICULTURAL SITUATION IN INDIA

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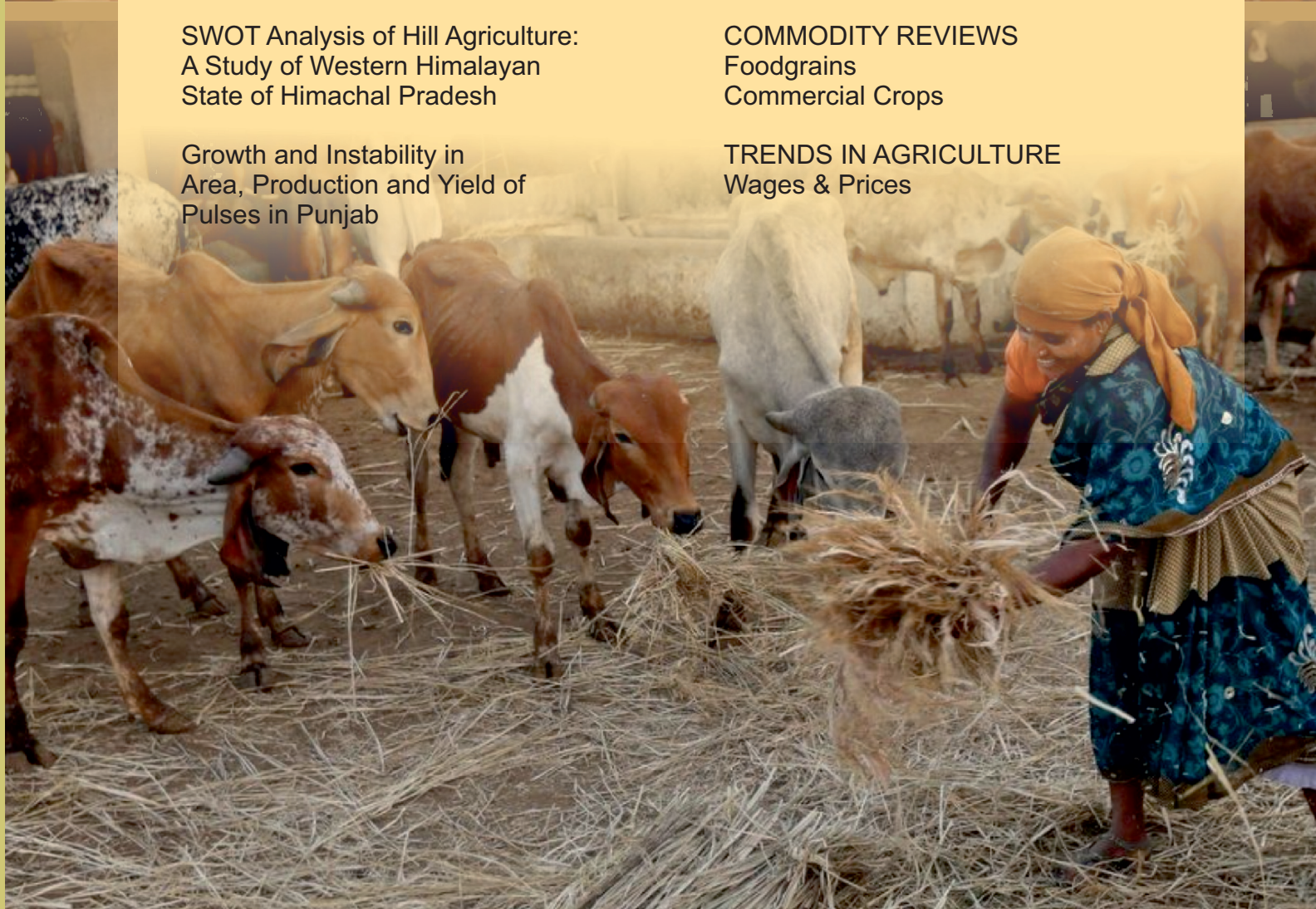

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From Editor's Desk

This issue of 'Agricultural Situation in India' highlights the Government's new initiatives and current policy in the farm sector and also provides a consolidated survey of agriculture, two academic research articles, one on an analysis of hill agriculture in Western Himalayan state of Himachal Pradesh with special emphasis on strengths, weaknesses, opportunities and threats (SWOT); and other on growth and instability in area, production and yield of pulses in Punjab; and an agro-economic research study report on the assessment of livestock feed and fodder in the state of Uttar Pradesh.

The major farm sector news and initiatives taken by the government discussed in this issue are: launch of bamboo clusters in nine states; organisation of webinar to discuss water use efficiency and coverage of micro-irrigation in Indian agriculture; setting up of National Research Centre on Camels in Bikaner; highlights of major developments in genetically modified (GM) crops; announcement of remunerative prices to farmers for horticultural crops; an assessment of damage to crops due to locust attack; increasing use of harmful chemicals and pesticides for ripening of fruits; an overview of various schemes to promote organic farming in the country; promotion of beneficial cropping patterns; strengthening of ICAR; status of settlement of claims under PMFBY; major highlights of recently passed farmers bills; initiatives taken by government for promoting cultivation of oranges; status of functioning of PM-AASHA scheme; a micro view on cardamom cultivation; status of irrigated land in the country; a discussion on benefits of agricultural schemes to farmers; major developments for agricultural imports, cold storage facilities, start-ups in agriculture sector, etc. Other news includes initiation of rabi campaign 2020; increment in MSP of various crops and its procurement status; announcement of first advance estimates of production of major kharif crops for 2020-21; organization of 'Kritagya' hackathon by National Agricultural Higher Education Project for developing farm mechanization; technology license agreement on Brucella abortus S19Ä per vaccine, launch of centralized farm machinery performance testing portal; sowing figures for kharif season and inauguration of IARI (Assam).

So far as the agricultural scenario is concerned, the Wholesale Price Index (WPI) of foodgrains, pulses, vegetables and paddy increased by 0.19 percent, 9.86 percent, 7.03 percent and 2.49 percent, respectively, in August, 2020 as compared to that in August, 2019. The 2020 cumulative monsoon season rainfall in the country has been 9 percent higher than the long period average during 1st June, 2020 to 30th September, 2020. Current live storage in 123 major water reservoirs in the country was 147.29 BCM as against 128.21 BCM of normal storage based on the average storage of last 10 years.

In academic column's first article, the authors mainly, analyze the SWOT of hill agriculture in the state of Himachal Pradesh during the five year plan periods since 1951-52. Based on secondary data collected from state planning department and Agro-Economic Research Centre, Himachal Pradesh University, Shimla, the study focused on the planning aspects of agriculture, horticulture and animal husbandry sectors. The author also emphasized on various constraints faced by farmers and gives an overview of areas of intervention in the state in respect to total outlay and respective allocation during the different plan periods. The analysis reveals that in order to make green revolution period a movement, the outlay in the fourth plan period was enhanced to 3.5 times that of the third plan. Similarly, the outlay in horticulture sector enhanced after IVth plan, with the exception of VIth and XIIth plan period. However, for animal husbandry, a decrease of allocation is noted during VIIth plan and XIth plan period. Based on the findings, the author suggested that the State should emphasis on the development of off-season vegetables, cash crops and organic manure based farming. In horticulture sector, the concentration should be on forest-based plants like medicinal herbs and aromatic plants, etc. While in livestock sector, more useful programs like better breeding, feeding and disease control should be encouraged along with the improvement in pasture land.

In the second article, the authors interestingly, examine the pattern of growth and instability in area, production and productivity of pulses in Punjab during the period 1985-86 to 2017-2018. The study is based on the secondary data collected from the publications of Indian Institute of Pulses Research (IIPR) and *www.indiastat.com* to elicit the trends and instability in area, production and yield of pulses in Punjab by using compound annual growth rate (CAGR), coefficient of variation, Cuddy-Della Valle Index (CDI) and Coppock's Instability Index (CII). The analysis reveals that pulses has shown a negative and significant growth rate of 6.17 percent and 5.60 percent per annum for the area and production, respectively, but showed positive significant change in productivity, *i.e.,* 0.61 percent per annum from TE 1987-88 to TE 2017-18. It is suggested that there is a need to strengthen research & development for improving productivity of pulses in the state. More focus should be given to the summer crops like mung bean which takes only 65 days in cultivation and emerged as a good source of income to the farmers.

Agro-economic research included in this issue is a report on assessment of livestock feed and fodder in the state of Uttar Pradesh prepared by Agro-Economic Research Centre, University of Allahabad, Prayagraj. The primary objectives of the report are to estimate the area, production and productivity of major green and dry fodder crops and analyse the growth pattern of livestock production. The report also makes an assessment of requirement, availability and resultant deficit of feed and fodder. To realize these objectives, proportionate sampling technique was applied to draw a sample from total livestock rearers from the selected districts based on largest population of livestock. On the basis of research done, it is suggested that livestock population of improved breeds should be increased. Round the year cultivation of fodder crops should be incentivised and education and training must be provided to rearers on livestock care, handling of fodder, etc.

P. C. Bodh

Farm Sector News*

The Union Minister for Agriculture and Farmers Welfare, Shri Narendra Singh Tomar launched 22 bamboo clusters in 9 States and also released a logo for National Bamboo Mission

The Union Minister for Agriculture and Farmers Welfare, Rural Development & Panchayati Raj, Shri Narendra Singh Tomar, on 8th September, 2020, inaugurated 22 bamboo clusters in 9 States (Gujarat, MP, Maharashtra, Odisha, Assam, Nagaland, Tripura, Uttarakhand and Karnataka) through virtual mode. A logo for the National Bamboo Mission was also released. Lauding the success of the National Bamboo Mission, Shri Tomar said that the country is now gearing up to increase the export of bamboo products.

Addressing the video conference, the Union Agriculture Minister said that Prime Minister Shri Narendra Modi has always strived that local industries should be protected and helped in progress so that local artisans get a source of livelihood. The government's goal in the bamboo sector is being achieved with the concerted efforts of all stakeholders of the bamboo mission. Keeping in consideration the importance of bamboo, the Indian Forest Act 1927 was amended in the year 2017 to remove bamboo for the category of trees, as a result now anyone can undertake cultivation and business in bamboo and its products. Import policy has also been modified to ensure progress of the bamboo industry in the country. Shri Tomar said that the use of bamboo has been an ancient tradition in India and it is now being supported with modern technology. Youth are also being given training for bamboo industry.

The minister called upon the states to take forward the objectives of the mission which would contribute to the call of Hon'ble Prime Minister for an Atma Nirbhar Bharat through an Atma Nirbhar Krishi. The support being given by the mission to local artisans through locally grown bamboo species would also actualize the goal of vocal for local. This would help to increase the income of farmers as well as reduce dependency on imports of some raw material. With the wealth of bamboo in India and growing industry, India should aim to establish herself in global markets for both engineered and handcrafted products.

The restructured National Bamboo Mission was launched in 2018-19 for holistic development of the complete value chain of the sector. The mission is being implemented in a hub (industry) and spoke model, with the main goal of connecting farmers to markets so as to enable farmer producers to get a ready market for the grown bamboo and to increase supply of appropriate raw material to domestic industry. The mission was launched as a natural corollary of the historic amendment of the Indian Forest Act in 2017, removing bamboo from the definition of trees, hence bamboo grown outside forests no longer need felling and transit permissions.

The bamboo ecosystem has been energized with 23 states being assisted, including all the 8 states of north east. Ten most important species which are required by the industry have been identified and quality planting material is being made available to farmers for plantations. Assam has already engaged FPOs for raising plantations. New FPOs would also be formed under the recently approved scheme of DAC&FW for formation of 10,000 FPOs in 5 years. Further primary processing, common facility centers (CFCs) are being set up close to the plantations which would enable cost of transportation of whole bamboo to be reduced, increase local entrepreneurship and move to a zero waste approach.

These would be engaged in raising nurseries and plantations and/or product development like furniture, agarbatti, venetian blinds, chopsticks, toothbrush, lifestyle products, jewellery, bottles, yoga mat, charcoal, etc. Together with industrial products, the National Bamboo Mission also endeavors to upgrade skills of traditional bamboo craftsmen as per requirement of contemporary markets with tie up with enterprises and premier institutes so that our cultural heritage is continued. The Sector Skill Councils established under National Skill Development Agency would also impart skills and recognition of prior learning to traditional artisans. This would also encourage the youth to carry forward their family traditions.

*Source: www.pib.nic.in

The winner of the logo contest, Shri Sai Ram Goudi Edigi of Telengana was selected from 2033 entries received on MyGov platform from across the country. The logo portrays a bamboo culm in the center of a circle composed of half an industrial wheel and half farmers, depicting the objectives of NBM appropriately. The green and yellow colour of the logo symbolise bamboo often termed as green gold.

Webinar held on Enhancing Water Use Efficiency and Coverage of Micro Irrigation in Indian Agriculture

The Union Minister for Agriculture and Farmers Welfare, Rural Development and Pachayati Raj, Shri Narendra Singh Tomar, on 9th September, 2020, inaugurated a webinar on "Enhancing Water Use Efficiency and Coverage of Micro Irrigation in Indian Agriculture" organized by the Department of Agriculture, Cooperation & Farmers Welfare (DAC &FW), Ministry of Agriculture and Farmers Welfare.

Addressing the webinar, Shri Narendra Singh Tomar said that the Government has set the target of covering 100 lakh ha in five years under micro-irrigation. In the year 2019-20, about 11 lakh farmers have been benefitted by the adoption of drip and sprinkler irrigation system. During the last five years, an area of 47.92 lakh ha has been covered under micro irrigation in the country which includes 11.72 lakh ha for the year 2019-20 which is a significant achievement. Further, he informed that the Department of Agriculture, Cooperation & Farmers Welfare (DAC&FW) is implementing Per Drop More Crop component of Pradhan Mantri Krishi Sinchayi Yojana (PMKSY-PDMC) since 2015-16 for enhancing water use efficiency in agriculture sector and more importantly the overall benefits towards increasing returns to farmers.

The Union Agriculture Minister said that the government has created a dedicated Micro Irrigation Fund (MIF) of ₹ 5000 crores with National Bank for Agriculture and Rural Development (NABARD) with the objective to facilitate States in mobilizing resources for expanding coverage of micro irrigation. The steering committee of MIF and NABARD has sanctioned projects of ₹ 3805.67 crore for covering 12.53 lakh ha under MIF. He advised all the states to access MIF for incentivizing micro irrigation through an additional (top up) subsidy over and above the one available under PMKSY- PDMC for achieving the target. He also asked the states to access the fund for innovative integrated projects including projects in the Public Private Partnership (PPP) mode depending on state specific requirements to bring additional area under micro irrigation PDMC.

Stressing that micro irrigation not only increases water use efficiency but also the productivity of the crops, Shri Tomar said that there is a need for adopting a holistic approach for more production from unit area by improving soil health, reduction in input costs, enhancing crop productivity and increasing farmers' awareness for benefiting the farming community and helping the vision of Prime Minister Shri Narendra Modi for doubling of farmers' income.

The minister called upon the states to come forward to achieve the target coverage of micro irrigation for enhancing water use efficiency in agriculture which would contribute to the call of Hon'ble Prime Minister for an Atma Nirbhar Bharat through an Atma Nirbhar Krishi. The integrated and concerted efforts of various stakeholders-departments/ministries, state implementing agencies, micro irrigation system manufactures in a mission mode would help in achieving the targets and bringing more coverage under micro irrigation for the benefit of farming community.

Panel discussions were held on technical aspects of the subject. The panel on enhancing water use efficiency in Indian agriculture was chaired by Prof. Ramesh Chand, Member NITI Aayog. The panel on enhancing coverage of micro irrigation was chaired by Shri Parshottam Rupala, MoS, Agriculture and Farmers Welfare and the panel on precision irrigation systems and role of private sector was chaired by Dr. Alka Bhargava, Additional Secretary, DAC&FW.

Union Minister of State for Agriculture & Farmers Welfare, Shri Kailash Chaudhary was also present. The experts from state governments, NABARD, irrigation association, water technologists,

Confederation of Indian Industry (CII), International Water Management Institute deliberated on coverage of micro irrigation for enhancing water use efficiency in agriculture sector in the country. More than 100 participants from various departments of Government of India, state governments, implementing agencies, NCPAH including a few progressive farmers took part in the webinar.

National Research Centre on Camels

For setting up of a branch of National Research Centre on Camel (NRCC), Bikaner in Gujarat, an appropriate size of land and other resources on nominal cost/lease basis is desired from the Government of Gujarat.

Steps to protect Kharai camels:

i. Kharai camel has been characterized, registered and gazette notified as breed by DARE/ ICAR.

ii. NRCC has signed an MoU with Kamdhenu University, Gujarat for further breed conservation and development by (i) Training of farmers for scientific camel husbandry; (ii) Organizing Scientist-farmers interaction meetings; (iii) Holding animal health camps; (iv) Providing technical support for development of the entrepreneurship towards the camel milk.

Following is being carried out by NRCC, Bikaner to protect double humped camel in Ladakh:

i. Camel health management by organizing health camps in Nubra valley.

ii. Nutritional management by utilizing local feed resources.

Study on Cultivation of GM Crops

Bt cotton is the only genetically modified (GM) crop that has been approved for commercial cultivation in 2002 by the Government of India. Long term studies were conducted by ICAR on the impact of *Bt* cotton which did not show any adverse effect on soil, microflora and animal health. However, the Parliamentary Standing Committee on Science and Technology, Environment and Forests, in its report on 'Genetically Modified Crops and Its Impact on Environment', submitted to parliament on 25th August, 2017, recommended that GM crops should be introduced in the country only after critical scientific evaluation of its benefit and safety, and also recommended restructuring of regulatory framework for unbiased assessment of GM crops.

In 2002 approval for the commercial release of *Bt* cotton hybrids/ varieties resistant to cotton bollworm was given.

Bt brinjal resistant to brinjal shoot fly developed by M/S Mahyco in collaboration with University of Agricultural Sciences, Dharwad; Tamil Nadu Agricultural University, Coimbatore and ICAR-Indian Institute of Vegetable Research, Varanasi was approved by GEAC in 2009 but due to 10 years moratorium imposed on GM crops by the Technical Expert Committee (TEC) appointed by the Hon'ble Supreme Court of India, no further action on commercialization has been taken. Recently, the Genetic Engineering Appraisal Committee (GEAC), MoEF & CC, Government of India has again allowed biosafety research field trials of two new transgenic varieties of indigenously developed Bt brinjal in eight states during 2020-23 only after taking no-objection certificate (NOC) from states concerned and confirmation of availability of isolated stretch of land for this purpose. These indigenous transgenic varieties of brinjal hybrids – namely, Janak and BSS-793, containing Bt Cry1Fa1 gene (Event 142) – have been developed by the National Institute for Plant Biotechnology, (*NIPB, erstwhile* National Research Centre on Plant Biotechnology, New Delhi), Indian Council of Agricultural Research (ICAR).

GM mustard Dhara Mustard Hybrid 11 (DMH 11) developed by Delhi University is pending for commercial release as GEAC has advised to generate complete safety assessment data on environmental biosafety, especially effects on beneficial insect species.

ICAR always promotes the science based innovative technology including research on GM crops. 'Network Project on Transgenic in Crops' (presently Network Project on Functional Genomics and Genetic Modification in Crops) was launched by ICAR in 2005 for development of GM crops in case of pigeon pea, chickpea, sorghum, potato, brinjal, tomato and banana for different traits and the material is in different stages of development.

The Government of India has very strict guidelines to test and evaluate the agronomic value of the GM crops so as to protect the interests of the farmers. These guidelines address all concerns with regard to the safety of GM seeds. The regulatory system for GM crops as operative in the Department of Biotechnology, Ministry of Science and Technology (Review Committee on Genetic Manipulation; RCGM) and Ministry of Environment and Forests (Genetic Engineering Appraisal Committee; GEAC) has guidelines to consider the GM crops on case-by-case basis towards testing.

Remunerative Prices to Farmers for Horticulture Crops

The production of horticulture crops like vegetables and flowers have increased in recent years in the country.

(Production in '000 Tonnes)

Year	Vegetables	Flowers
2016-17	178172	2392
2017-18	184041	2631
2018-19	183170	2910
2019-20 (3rd Adv. Est)	189464	2994

The details of production of Potato, Tomato and Onion during the last three years is as under:

(Production in '000 Tonnes)

	Potato	Tomato	Onion
2016-17	48605	20708	22427
2017-18	51310	19759	23262
2018-19	50190	19007	22819
2019-20 (3rd Advance Estimate)	48662	21195	26148

The government implements the Market Intervention Scheme (MIS) for procurement of agricultural and horticultural commodities which are perishable in nature and are not covered under the Price Support Scheme (PSS). The objective of intervention is to protect the growers of these commodities from making distress sale in the event of a bumper crop during the peak arrival period when the prices tend to fall below economic levels and cost of production. The condition is that there should be either at least a 10 percent increase in production or a 10 percent decrease in the ruling market prices over the previous normal year. The scheme is implemented at the request of a state/ UT government which is ready to bear 50 percent of the loss (25 percent in case of North-Eastern States), if any, incurred on its implementation. The extent of total amount of loss to be shared on a 50:50 basis between the central government and the state government is restricted to 25 percent of the total procurement value which includes cost of the commodity procured plus permitted overhead expenses. Under the scheme, in accordance with MIS guidelines, a pre-determined quantity at the fixed Market Intervention Price (MIP) is procured by the agencies designated by the state government for a fixed period or till the prices are stabilized above the MIP whichever is earlier.

In order to provide farmers remunerative prices for their produce, the Government has taken several steps:

The government has implemented National Agriculture Market (e-NAM) scheme, an online virtual trading platform to provide farmers and Farmer Producer Organizations (FPOs) with opportunity for transparent price discovery for remunerative prices for their produce through competitive online bidding system.

Through Agriculture Marketing Infrastructure (AMI) Scheme, development of private mandis, direct marketing, declaring warehouses, silos, cold storages as deemed markets and also developing Gramin Haats into Gramin Agricultural Markets (GrAMs), are promoted.

The Government is now implementing a central sector scheme, namely "Formation and Promotion of 10,000 Farmer Producer Organizations (FPOs)" to enhance cost effective production and higher net incomes to the member farmer producers through better liquidity and market linkages for their produce and become sustainable through collective action.

In addition to above, to provide additional channels to farmers for marketing of their produce and promote barrier-free inter-state and intra-state trade and commerce, the Government has promulgated "The Farmers' Produce Trade and Commerce (Promotion and Facilitation) Ordinance, 2020" on 5th June, 2020. Now, farmers can sell their produce from their farm-gate, residence to processing units, warehouse, silos, cold storage, etc., nearer to

their farm-gate. Farmers would be getting better price, and also be able to save the transportation cost, unofficial payment of market fee, commission charges and other marketing charges in the existing system of agricultural marketing.

Damage to Crops due to Locust Attack

During 2019-20, locust attack was reported in some districts of Rajasthan and Gujarat. Rajasthan Government has reported that a total area of 1,79,584 hectares of 8 districts of the state was affected by locust attack during 2019-20. The State Government of Gujarat has reported that crop loss due to locust attack was observed in a total area of 19,313 hectares of 2 districts of the State during the year 2019-20.

During 2020-21, the locust incursions were reported in 10 States of Rajasthan, Madhya Pradesh, Punjab, Gujarat, Uttar Pradesh, Maharashtra, Chhattisgarh, Bihar, Haryana and Uttarakhand, where operations were undertaken in coordination with state governments for locust control. State Governments of Gujarat, Chhattisgarh, Punjab and Bihar have reported no crop losses in their States.

Initially during May-June 2020, Government of Rajasthan reported crop damage of 33% and more due to locust attack in 2235 hectare area in Bikaner, 140 hectare in Hanumangarh and 1027 hectare area in Sri Ganganagar; but now, as per revised report, it has been stated that earlier submitted data was related to initial stage of crop sown in kharif season and this area of crop loss has been re-sown by farmers.

State Governments of Haryana, Madhya Pradesh, Maharashtra, Uttar Pradesh and Uttarakhand have reported crop damage of less than 33% in 6520 ha, 4400 ha, 806 ha, 488 ha and 267 ha, respectively, due to locust attack this year.

For 2019-20, State Government of Rajasthan has reported that a relief of ₹ 132.54 crores have been paid to 79,922 farmers due to locust attack from State Disaster Response Fund in the form of agriculture input subsidy. State Government of Gujarat has reported that a total amount of approximately ₹ 18.74 crore has been paid to 9137 farmers during 2019-20 as agricultural input subsidy from the State Disaster Response Fund.

For the financial year 2020-21, till now, no state government has reported distribution of relief to the farmers affected by locust attack for 2020-21. However, State Government of Rajasthan has informed that Girdawari/survey work is underway for estimation of crop losses due to attack of locusts. The yield losses would be assessed through crop cutting experiments and compensation would be paid to all registered farmers as per provisions of Pradhan Mantri Fasal Bima Yojana (PMFBY).

Use of Chemicals and Pesticides for Ripening of Fruits

As per the information provided by the Food Safety and Standards Authority of India (FSSAI), Ministry of Health and Family Welfare; sub-regulation 2.3.5 of Food Safety and Standards (Prohibition and Restriction on Sales) Regulations, 2011 is related to "Prohibition of use of Calcium Carbide in ripening of fruits". According to this sub regulation, "No person shall sell or offer or expose for sale or have in his premises for the purpose of sale under any description, fruits which have been artificially ripened by use of acetylene gas, commonly known as carbide gas.

However, ripening of fruits by using ethylene gas at a concentration upto 100 ppm (100µ/L) depending upon the crop, variety and maturity has been permitted. Ethylene is a safer alternative. It is also produced in the fruits naturally to stimulate their ripening in a natural way.

The Food Safety and Standards Authority of India (FSSAI) has developed a Guidance Note No.04/2018 on "Artificial Ripening of Fruits – Ethylene gas- A safe fruit ripener" and shared through its website, *i.e., www.fssai.gov.in* and social media handles. The purpose of this guidance note is to create awareness related to different aspects of artificial ripening of fruits among food business operators/traders, consumers and food safety officials. It also includes standard operating procedure detailing all facets of artificial ripening using ethylene gas.

Implementation and enforcement of Food Safety and Standards Act, 2006 and rules and regulations made thereunder primarily lies with state/UT governments. Regular surveillance, monitoring, inspection and sampling of food products, including fruits and vegetables, are being carried out by the food safety officers of states/UTs and appropriate

penal action is initiated as per the provisions of FSS Act, 2006 against the defaulting food business operators (FBOs).

FSSAI at present has a network of 264 laboratories across the country comprising of 246 laboratories for primary testing recognized & notified under section 43(1) of FSS act 2006; and, 18 laboratories for appellate (referral) testing recognized & notified under section 43(2) of FSS act 2006. Most of these laboratories have the facilities to check calcium carbide.

Organic Farming in the Country

Assistance is provided under different schemes by the Government for promoting organic farming in the country:

1. **Paramparagat Krishi Vikas Yojana (PKVY)**: The scheme promotes cluster based organic farming with PGS certification. Cluster formation, training, certification and marketing are supported under the scheme. Assistance of ₹ 50,000 per ha/3 years is provided out of which 62 percent, *i.e.*, ₹ 31,000 is given as incentive to a farmer towards organic inputs.

2. **Mission Organic Value Chain Development for North Eastern Region (MOVCDNER)**: The scheme promotes 3rd party certified organic farming of niche crops of north-east region through Farmers Producer organizations (FPOs) with focus on exports. Farmers are given assistance of ₹ 25000/ha/3 years for organic inputs including organic manure and biofertilizers, etc. Support for formation of FPOs, capacity building, post-harvest infrastructure up to ₹ 2 crores are also provided in the scheme.

3. **Capital Investment Subsidy Scheme (CISS) under Soil Health Management Scheme:** 100 percent assistance is provided to state government/government agencies for setting up of mechanized fruit/vegetable market waste/agro waste compost production unit up to a maximum limit of ₹ 190.00 lakh/unit (3000 total per annum capacity). Similarly, for individuals/ private agencies assistance up to 33 percent of cost limit to ₹ 63 lakh/unit as capital investment is provided.

4. **National Mission on Oilseeds and Oil Palm (NMOOP)**: Financial assistance@ 50 percent subsidy to the tune of ₹ 300 per ha is being provided for different components including biofertilizers, supply of Rhizobium Culture/ Phosphate Solubilising Bacteria (PSB)/Zinc Solubilising Bacteria (ZSB)/ Azatobacter/ Mycorrhiza and vermi compost.

5. **National Food Security Mission (NFSM):** Financial assistance is provided for promotion of Biofertilizer (Rhizobium/PSB) at the rate 50 percent of the cost limited to ₹ 300 per ha.

Cultivable land area under organic farming has more than doubled from 11.83 lakh ha in 2014 to 29.17 lakh ha in 2020 due to the focused efforts of the government. Over the years, the organic promotion activities led to development of state specific organic brands, increased domestic supply and exports of organic produce from NER. Taking cue from the success of the organic initiatives, a target of 20 lakh ha additional area coverage by 2024 is envisaged in the vision document. Awareness programmes, availability of adequate post- harvest infrastructure, marketing facilities, premium price for the organic produce, etc., would certainly motivate farmers towards organic farming thereby increasing organic coverage in the country.

As per international resource data from Research Institute of Organic Agriculture (FiBL) and the International Federation of Organic Agriculture Movements (IFOAM) Statistics 2020, India stands at 9th position in terms of certified agricultural land with 1.94 million ha (2018-19).

Promotion of natural farming under Bharatiya Prakritik Krishi Padhati (BPKP) of PKVY has been initiated to encourage use of natural on-farm inputs for chemical free farming. Andhra Pradesh and Kerala have taken up 1 lakh ha and 0.8 lakh ha area, respectively, for promotion of natural farming under BPKP. Similarly, continuous area certification and support for individual farmers for certification have also been initiated during 2020-21 to bring in default organic areas and willing individual farmers under the fold of organic farming

State agencies, primary agricultural credit societies, farmer producer organisations, entrepreneurs, etc., can avail loans for setting up of post-harvest infrastructure for value addition

to organic produce under 1.00 lakh cr Agriculture Infrastructure Fund (AIF) of Atma Nirbhar Bharat.

Beneficial Cropping Patterns

The cropping pattern is dependent on various factors, *viz*., agro-climatic conditions of the region, availability of resources, market forces, socio-economic conditions of the farmers, demand and supply of agricultural produce, etc. Accordingly, Government of India has been emphasizing promotion of various crops/ cropping system, *viz*., rice, wheat, pulses, coarse cereals, nutri cereals & commercial crops under National Food Security Mission (NFSM), oilseeds under NFSM-Oilseeds, horticultural crops under Mission for Integrated Development of Horticulture (MIDH). The new technologies on crops/cropping pattern are demonstrated at the farmers' field through State Department of Agriculture/ Indian Council of Agricultural Research (ICAR)/State Agricultural Universities (SAUs)/Krishi Vigyan Kendras (KVKs), etc., and are creating awareness among farmers to choose appropriate crops/cropping system.

ICAR-Indian Institute of Farming Systems Research, Modipuram is undertaking extensive research (on-station research) and technology validation through farmers' participatory research (on-farm research) on crop diversification under the aegis of All India Coordinated Research Projects-Integrated Farming Systems (AICRP-IFS) in 25 states/union territory with the participation of 34 state agricultural universities and one central university.

A study on "Identification of cropping system module for different farming system" at 36 locations through AICRP on Integrated Farming Systems has been conducted in 31 districts in 20 states.

The Department of Agriculture, Cooperation and Farmers Welfare has organized seven Agro Climatic Zonal Conferences with the state governments, ICAR, agricultural universities, KVKs during the month of September 2020 for better planning of cropping systems.

Strengthening of ICAR

The Indian Council for Agricultural Research (ICAR) under Department of Agricultural Research and Education (DARE), Government of India is the apex organization to promote agricultural research and development in the country. National Agricultural Research System (NARS) under DARE/ICAR consists of 103 agricultural research institutes, 75 agricultural universities, 82 all India coordinated research projects/network projects and 11 agriculture technology application research institutes ably supported by a network of 721 Krishi Vigyan Kendras (KVKs) established at the district level and mandated with technology assessment and demonstration for wider application and capacity development of the farmers. The organization has played crucial role as a hub for knowledge and technology resources to promote agricultural research, education, frontline extension and capacity development activities in the country, and to make the country self- reliant in agriculture sector.

To accelerate the development of new and improved crops, improved crop health and sustainable farming practices, Nanaji Deshmukh Plant Phenomics Center for research was established at IARI, Pusa, New Delhi. Towards creation of new state of art infrastructure, Rajendra Agricultural University, Pusa, Bihar was upgraded to Dr. Rajendra Prasad Central Agricultural University. Two new institutes on the lines of Indian Agricultural Research Institute (IARI) were established which include; IARI-Jharkhand and IARI-Assam. New colleges were started under Central Agricultural University, Imphal and Rani Laxmibai Central Agricultural University, Jhansi. Mahatma Gandhi Integrated Farming System Research Institute was established at Motihari, Bihar to provide holistic solution for the farming system in the flood prone areas. Besides these, 4 new regional research stations of horticultural institutes were opened which include; ICAR-CISH, Lucknow, at Malda (WB), ICAR-CITH, Srinagar at Dirang (Arunachal Pradesh), ICAR-DFR, Pune at Kadiyam (Andhra Pradesh) and ICAR-CCRI, Nagpur at Viswanath Chariali (Assam). To improve the outreach of the ICAR among farming community of the country, 51 new Krishi Vigyan Kendras were established during the last 3 years taking the total number of KVKs upto 721. The research programmes of ICAR/ NARS are regularly strengthened, re-structured, re-oriented and prioritized with thrust on enhancing production and productivity for optimum and sustainable utilization of resources through proven technological interventions to realize the full production potential in all areas of agriculture and to address the critical research gaps.

Timely Settlement of Claims under PMFBY

Delay in release of share in premium subsidy by some states/UTs is one of the main reasons for delay in settlement on claims under Pradhan Mantri Fasal Bima Yojana (PMFBY).

The Operational Guidelines of PMFBY envisage timely release of state government share in premium subsidy to ensure timely settlement of claims. However, settlement of claims have been delayed due to delays in release of their share by some states like Assam, Bihar, Andhra Pradesh, Telangana, Madhya Pradesh, Rajasthan, West Bengal, Gujarat, etc., in one or more season.

This Department is regularly monitoring the implementation of PMFBY including timely settlement of claims through one to one/weekly meetings and weekly video conference with all stakeholders. Defaulting states/UTs are also being asked in writing from time to time to release their respective share in premium subsidy. Moreover, provisions of penal interest at the rate of 12 percent were made in the revised operational guidelines for delay in release of their share in premium subsidy by states/UTs. Further, as per revamped guidelines w.e.f. kharif 2020, the states delaying the release of subsidy beyond stipulated timelines cannot participate in upcoming seasons.

After detailed discussions with stakeholders, the Government has recently approved the revamping of the Pradhan Mantri Fasal Bima Yojana (PMFBY) and Restructured Weather Based Crop Insurance Scheme (RWBCIS) for implementation from kharif 2020 season.

To increase the coverage under the PMFBY, the Operational Guidelines of the PMFBY provides for creation of awareness among farmers. Accordingly, the Government has taken several initiatives including active involvement of all stakeholders especially States, implementing insurance companies, financial institutions and Common Service Centre (CSCs) network for conduct of publicity campaign/ awareness programmes including organization of camps in the rural areas to build farmer awareness about crop insurance schemes. Since, the scheme has been made voluntary for all the farmers from kharif 2020, the behavioral change communication activities were also conducted through various media tools, *viz.*, print, electronic, digital and social media, etc. Mobile Information, Education and Communication (IEC) vehicles were used to motivate farmers during enrollment campaign carried out for kharif 2020 at grass root level.

As enshrined in the operational guidelines of the scheme, insurance companies have been asked to mandatorily utilize 0.5 percent of gross premium collected by them for IEC activities at grass root level to build overall insurance literacy of farmers to take informed decisions.

Apart from this, other activities for awareness generation involve the publicity of features and benefits of the scheme through advertisements in leading national/local newspapers, telecast through audio-visual media, distribution of pamphlets in local languages, participation in agriculture fairs/ mela/goshti, dissemination of SMS through Kisan Portal/national crop insurance portal and conduct of workshops/trainings of state officials, financial institutions and farmers.

The integration of crop loss intimation feature in Crop Insurance App has been facilitating farmers to intimate their crop loss due to localized calamity within the prescribed time limit.

The Government has also produced a series of audio-visual material on key features of PMFBY and promoted through a dynamic social and digital media campaign during the lockdown period due to COVID-19.

Due to these efforts made by the central government, state governments and other stakeholders coverage under the scheme has been increased to 30 percent of the Gross Cropped Area (GCA) from 23 percent in 2015-16 under erstwhile schemes. Participation of non-loanee farmers have also increased from 5 percent under erstwhile schemes to 37 percent under PMFBY. These awareness activities also leads to following qualitative and quantitative changes in all stakeholders including farmers in most of the implementing states especially in Tamil Nadu, Maharashtra, Chhattisgarh, Karnataka, Madhya Pradesh, Haryana, Odisha, Andhra Pradesh, Rajasthan, etc.:

i. Increased awareness level of farmers and other stakeholders about channels and procedure of

enrolment, risks covered, premium rates of different crops, procedure for reporting claims, and claim settlement.

ii. Increased coordination and synergy between state government, banks, CSCs, panchayati raj institutions and the respective insurance companies.

iii. Increased awareness amongst farmers on doubts and myths about the scheme.

iv. Ensured retention of loanee farmers in the scheme especially in complete voluntary regime from kharif 2020.

v. Effective implementation of grievance redressal mechanism within stipulated time frame.

vi. Increased level of farmers trust in the PMFBY

vii. Created large number of opinion makers and master trainers through online training at grass root level to ensure continuous sensitization of farmers.

viii. Effective use of social and digital media to disseminate key features of PMFBY amongst online community and other stakeholders

Parliament passes The Farmers' Produce Trade and Commerce (Promotion and Facilitation) Bill, 2020 and The Farmers (Empowerment and Protection) Agreement of Price Assurance and Farm Services Bill, 2020

Parliament passed two bills aimed at transforming agriculture in the country and raising farmers' incomes. The Farmers' Produce Trade and Commerce (Promotion and Facilitation) Bill, 2020 and The Farmers (Empowerment and Protection) Agreement of Price Assurance and Farm Services Bill, 2020 which were passed by Lok Sabha on 17th September, 2020, were also passed by the Rajya Sabha on 20th September, 2020. The Bills were introduced in Lok Sabha on 14th September, 2020 by Union Minister of Agriculture & Farmers Welfare, Rural Development & Panchayati Raj, Shri Narendra Singh Tomar, to replace ordinances promulgated on 5th June, 2020.

Speaking about the Bills, Shri Narendra Singh Tomar said that the Government under Prime Minister Shri Narendra Modi has taken several landmark decisions in last six years to ensure that farmers get remunerative prices for their produce, and for raising farmers' incomes and livelihood status. He again clarified that the procurement at Minimum Support Price would continue, assurance for this has been given by Hon'ble Prime Minister himself, rate of MSP has been increased considerably during 2014-2020 and MSP for coming Rabi season would be announced in coming week. The Union Agriculture Minister said that full protection has been ensured to farmers in these legislations.

The Farmers' Produce Trade and Commerce (Promotion and Facilitation) Bill, 2020

Main provisions:

i. The new legislation would create an ecosystem where the farmers and traders would enjoy freedom of choice of sale and purchase of agri-produce.

ii. It would also promote barrier-free inter-state and intra-state trade and commerce outside the physical premises of markets notified under state agricultural produce marketing legislations.

iii. The farmers would not be charged any cess or levy for sale of their produce and would not have to bear transport costs.

iv. The bill also proposes an electronic trading in transaction platform for ensuring a seamless trade electronically.

v. In addition to mandis, freedom to do trading at farmgate, cold storage, warehouse, processing units, etc.

vi. Farmers would be able to engage in direct marketing, thereby eliminating intermediaries resulting in full realization of price.

Doubts:

i. Procurement at Minimum Support Price would stop

ii. If farm produce is sold outside APMC mandis, these would stop functioning

iii. What would be the future of government electronic trading portal like e-NAM

Clarification:

i. Procurement at Minimum Support Price would continue, farmers can sell their produce at MSP rates, the MSP for rabi season would be announced next week

ii. Mandis would not stop functioning, trading would continue here as before. Under the new system, farmers would have the option to sell their produce at other places in addition to the mandis

iii. The e-NAM trading system would also continue in the mandis

iv. Trading in farm produce would increase on electronic platforms. It would result in greater transparency and time saving

The Farmers (Empowerment and Protection) Agreement of Price Assurance and Farm Services Bill, 2020

Main provisions:

i. The new legislation would empower farmers for engaging with processors, wholesalers, aggregators, large retailers, exporters, etc., on a level playing field. Price assurance to farmers even before sowing of crops. In case of higher market price, farmers would be entitled to this price over and above the minimum price.

ii. It would transfer the risk of market unpredictability from the farmer to the sponsor. Due to prior price determination, farmers would be shielded from the rise and fall of market prices.

iii. It would also enable the farmer to access modern technology, better seed and other inputs.

iv. It would reduce cost of marketing and improve income of farmers.

v. Effective dispute resolution mechanism has been provided for with clear time lines for redressal.

vi. Impetus to research and new technology in agriculture sector.

Doubts:

i. Under contract farming, farmers would be under pressure and they would not be able to determine prices

ii. How would small farmers be able to practice contract farming, sponsors would shy away from them

iii. The new system would be a problem for farmers

iv. In case of dispute, big companies would be at an advantage

Clarification:

i. The farmer would have full power in the contract to fix a sale price of his choice for the produce. They would receive payment within maximum 3 days.

ii. 10000 Farmer Producer organizations are being formed throughout the country. These FPOs would bring together small farmers and work to ensure remunerative pricing for farm produce

iii. After signing contract, farmer would not have sought out traders. The purchasing consumer would pick up the produce directly from the farm

iv. In case of dispute, there would be no need to go to court repeatedly. There would be local dispute redressal mechanism.

Cultivation of Oranges

As per third advance estimates 2019-20, total land under orange (Mandarin orange/kinnow) in the country is 4.79 lakh hectare. Major states involved in orange production are Madhya Pradesh, Punjab, Maharashtra, Rajasthan and Haryana.

There is no declining trend in Orange production in the country, as may be seen in the table below:

(in Lakh Tonne)

	2017-18	2018-19	2019-20 (3rd Advance Estimate)
All India Production	51.01	62.43	63.97

Mission for Integrated Development of Horticulture (MIDH), a centrally sponsored scheme is being implemented w.e.f. 2014-15, for holistic growth of the horticulture sector covering fruits, vegetables, root and tuber crops, mushrooms, spices, flowers, aromatic plants, coconut, cashew and cocoa. All states and UTs are covered under MIDH.

The mission envisages production and productivity improvement of horticulture crops including fruits and vegetables through various interventions. Under MIDH, assistance is provided for activities such as production of planting material, vegetable seed production, coverage of area with improved cultivars, rejuvenation of senile orchards, protected cultivation, creation of water resources, adoption of Integrated Pest Management (IPM), Integrated Nutrient Management (INM), organic farming, including in situ generation of organic inputs are taken up for development of fruits and vegetables. Capacity buildings of farmers and technicians are also provided for adopting improved technologies.

Under the mission, financial assistance is also provided for taking up various activities related to development of horticulture including post-harvest management. For the development of post-harvest management including establishment of pack house, pre-cooling unit, cold storage, mobile pre-cooling unit, cold room (staging), primary/mobile/minimal processing unit, ripening chamber, evaporative/low energy cool chamber, low cost preservation unit, low cost onion storage structure, Pusa zero energy cool chamber, subsidy at the rate 35 percent (for general areas) and 50 percent (for hilly and tribal areas) of capital cost of the project is available for both public and private sector enterprises.

ICAR-Central Citrus Research Institute, Nagpur has reported that it has so far trained as many as 42634 citrus growers and 2449 officials on countrywide basis under various extension/transfer of technology based programmes. During last five years, under the Technology Mission (MM-I) for North Eastern and Himalayan (NEH) region, centre organized a total of 20 trainings programmes (5- on campus and 15 off campus) covering 8 states of north- eastern region where concerned state government officers and field functionaries were trained on 'production of disease free planting material' and 'Citrus Rejuvenation'.

ICAR-Central Citrus Research Institute, Nagpur has reported that since 2003, it has produced 7.00 lakh planting materials of citrus and distributed to 3000 citrus growers and 16 citrus growing State Governments to develop a healthy mother stock.

Functioning of PM-AASHA Scheme

Pradhan Mantri Annadata Aay SanraksHan Abhiyan' (PM-AASHA) is an umbrella scheme to ensure Minimum Support Price (MSP) to farmers. It comprises the erstwhile Price Support Scheme (PSS) with certain modifications and rolling out of new schemes of Price Deficiency Payment Scheme (PDPS) and pilot of Private Procurement and Stockist Scheme (PPSS). Under PM-AASHA, states/UTs are offered to choose either PSS or PDPS in a given procurement season with respect to particular oilseeds crop for the entire state. Pulses and copra are procured under PSS. Only one scheme, *i.e.*, PSS or PDPS may be made operational in one State with respect to one commodity. Further, states have the option to roll out PPSS on pilot basis in district/selected APMCs of district involving the participation of private stockist for oilseeds. Further, wheat paddy and coarse grains are procured under the existing schemes of Department of Food and Public Distribution and cotton is procured under the existing schemes of Ministry of Textiles. It is helping farmers in getting increased MSP which provides adequate returns over the cost of production.

Government fixes MSP for 22 mandated crops which are paddy, jowar, bajra, maize, ragi, arhar, moong, urad, groundnut-in-shell, soyabean, sunflower, sesamum, nigerseed, cotton, wheat, barley, gram, masur (lentil), rapeseed/mustard, safflower, jute and copra. In addition, MSP of toria and de-husked coconut are also fixed on the basis of the MSPs of rapeseed/mustard and copra, respectively.

Cardamom Cultivation

Directorate of Arecanut & Spices Development (DASD) has reported that the cardamom plantation sector has been affected due to the outbreak of COVID-19 and consequent lockdown and

restrictions imposed to contain the spread of the pandemic. The major issues faced by the sector were the non- availability of migrant labourers, and marketing facilities including logistics due to the restrictions in movement coupled with the decline in the commercial activities across the globe. As the restrictions are relaxed by the government the situation is coming back to normal.

In order to support the cardamom farmers for selling their produce, the Spices Board India under commerce ministry has initiated steps and restarted the e-auction for cardamom by following the COVID protocol. The Board has formulated standard operational procedures (SOP) for the small and large cardamom sectors covering all aspects from production to marketing, to ensure the safety of stakeholders.

The Spices Board has released an advisory on the diligent use of pesticides and practicing the Integrated Pest Management (IPM) for the cardamom farmers. In view of the COVID situation, social media group of farmers were created for online dissemination of information on scientific cultivation practices and other cultural operations. Online webinars are being conducted at the field level to help the farmers and to address the issues in the sector.

DASD has reported that the Spices Board is implementing two schemes, *viz*., for small cardamom and large cardamom. In the small cardamom scheme, assistance is provided for re-planting (upto 8 hectare) irrigation and land development, improved cardamom curing devices, supply of kits, beekeeping boxes, mechanization and extension advisory services.

Under the large cardamom scheme, assistance is provided for re-plantation of large cardamom plantations, new planting, production of quality planning material, curing, supply of vermi compost unit, mechanization and quality improved training programmes, extension advisory services, etc.

The DASD has reported that cardamom production in the country has declined in 2018-19 and 2019-20 due to the unprecedented flood and subsequent prolonged dry spell experienced in the major cardamom growing regions in the country, especially in the States of Kerala and Karnataka. Idukki, Wayanad, Palakkad and Kottayam Districts of Kerala and Kodagu, Hassan, Madigeri, Chickmagalure, Shimoga Districts of Karnataka were among the worst affected districts.

Further, cardamom is a highly climate sensitive and location specific crop. Pest and disease incidence is also very high in cardamom. Cardamom is grown mainly in high altitude areas and hence the scope for area expansion is limited.

DASD has reported that the spices board is encouraging farmers for area expansion of cardamom in non-traditional areas. Large cardamom has been cultivated in non-traditional areas like Arunachal Pradesh, Nagaland, Manipur with much more efforts of the board. New extension offices have been opened in north-east to assist the farmers. More emphasis is given to produce certified cardamom seedling in flood affected areas of cardamom belt of Karnataka. Rejuvenation scheme is implemented in the flood affected cardamom growing areas of Kerala and Karnataka.

It is further reported that every year, the spices board is giving award with cash prize (₹ 1 lakh for first prize and ₹ 50000 for second prize) and citation to the best cardamom farmers to encourage the farmers in the field. Last year the large cardamom productivity award was won by a lady farmer from the border district of Arunachal Pradesh. Due to the efforts by the Spices Board for area expansion in NE region, large areas in the border district of Arunachal Pradesh have been brought under large cardamom cultivation.

Union Minister of Agriculture and Farmers Welfare, Shri Narendra Singh Tomar kick starts National Rabi Campaign 2020 for Atma Nirbhar Kheti

Union Minister of Agriculture and Farmers Welfare, Shri Narendra Singh Tomar has congratulated farmers and state governments for record foodgrain production of 296.65 million tonnes in 2019-20 under unfavourable conditions imposed by COVID-19. The pulses and oilseed production is expected to be at 23.15 and 33.42 million tonnes, respectively. Production of cotton is being estimated at 354.91 lakh bales with which India is set to rise to the first position in the world. This year has established a milestone in the history of Indian agriculture. Kharif sowing during this year up to 11th September, 2020, has been 1113 lakh hectares which is 46 lakh hectares more than normal sowing area. This

provides good opportunity for ensuring food and nutritional security of the country. Shri Tomar said that the farming community and state governments deserve special appreciation for this commendable achievement.

Addressing the national conference for rabi campaign 2020 held on 21st September, 2020 under his chairmanship to review the progress of kharif 2020-21 and plan for the rabi season, Shri Tomar said that the government is taking revolutionary steps to strengthen agriculture infrastructure and economic condition of the farmers. Recently, Agricultural Infrastructure Fund (AIF) scheme worth ₹ 1 lakh crore for 4 years has been launched for creating facilities for cold storage, warehouse, packaging, ripening & waxing plants by agri-entrepreneurs, farmers' association and local government agencies. Tentative allocation to the states have made on the basis of total value of output of the state from agriculture and allied sectors. A 3 percent interest subvention would be given on bank interest, making loan with effective interest rate in the range of 5.0 to 5.5 percent. Formation of 10,000 Farmers Producer Organisations (FPOs) is another such step to organize farmers in aggregation and marketing for higher returns. These would be registered under company or cooperative act and 15 percent would be constituted in aspirational and notified tribal areas.

India has three major growing seasons; kharif, rabi and summer, for cultivating large number of cereal, pulse, oilseed and cash crops. Rabi is important cropping season contributing to more than half of crop productions. National conferences are held before every season to take stock of the preparedness and ensure timely availability of seed, fertilizers and other inputs. This time good rainfall has occurred and water reservoirs are full which offers good opportunity.

The conference set a target of 301 million tonnes of foodgrains production for 2020-21 which includes 119.60, 108.00, 5.00, 9.57, 29.00 and 47.80 million tonnes of rice, wheat, jowar, bajra, maize and coarse cereals, respectively. More emphasis would be laid on production of pulses and oilseeds and targets have been set at 25.60 million tonnes for pulses and 37.00 million tonnes for oilseeds. To reduce import of edible oils, great emphasis is being laid on production of oilseeds and oil palm plantation indigenously. This rabi focus is on mustard under oilseeds and the target for production of mustard alone has been raised from 92 to 125 lakh tonnes.

MSP increased by ₹ 50 to ₹ 300 per quintal, Food Corporation of India and other State agencies would continue to purchase farm produce at MSP, APMC mandis would also continue to function

The Cabinet Committee on Economic Affairs (CCEA) chaired by the Prime Minister Shri Narendra Modi has approved the increase in the Minimum Support Prices (MSPs) for all mandated rabi crops for marketing season 2021-22. This increase in MSP is in line with the recommendations of Swaminathan Commission. Announcing this in the Lok Sabha on 21st September, 2020, Union Minister of Agriculture & Farmers Welfare, Shri Narendra Singh Tomar said that this is a very important day for farmers. The highest increase in MSP has been announced for lentil (₹ 300 per quintal) followed by gram and rapeseed & mustard (₹ 225 per quintal each) and safflower (₹ 112 per quintal). For barley and wheat, an increase of ₹ 75 per quintal and ₹ 50 per quintal, respectively, has been announced. The differential remuneration is aimed at encouraging crop diversification.

Shri Narendra Singh Tomar said that the Food Corporation of India (FCI) and other state agencies would continue to purchase farm produce at MSP as before. Hon'ble Prime Minister has always given assurance that procurement at MSP would continue, and the mandi system would also continue. The union agriculture minister said that the announcement of the MSP before the start of the Rabi season would help the farmers in deciding on their crop structure. The MSP for pulses (lentil) and oilseeds has been increased to boost production of these crops so that import of these items can be reduced.

Shri Tomar said that during 2009-2014, 1.52 LMT pulses were procured by the government. During 2014-2019, 76.85 LMT pulses had been procured which was an increase of 4955 percent. The payment made at MSP rates in the last 6 years is ₹ 7 lakh crore which is double that made by the previous government. He said that as assured by the Hon'ble PM and by the Government of India, new MSP rates have been announced. This is proof that procurement at MSP and the APMC mandis would continue to function, however, the farmer would be free to sell his produce outside these systems anywhere throughout the country to get remunerative prices.

TABLE 1: MINIMUM SUPPORT PRICES FOR ALL RABI CROPS FOR MARKETING SEASON 2021-22

Crops	MSP for RMS 2020-21 (₹/quintal)	MSP for RMS 2021-22 (₹/quintal)	Cost* of production 2021-22 (₹/quintal)	Increase in MSP (₹/quintal)	Return over cost (in per cent)
Wheat	1925	1975	960	50	106
Barley	1525	1600	971	75	65
Gram	4875	5100	2866	225	78
Lentil (Masur)	4800	5100	2864	300	78
Rapeseed & Mustard	4425	4650	2415	225	93
Safflower	5215	5327	3551	112	50

*Includes all paid out costs such as those incurred on account of hired human labour, bullock labour/machine labour, rent paid for leased in land, expenses incurred on use of material inputs like seeds, fertilizers, manures, irrigation charges, depreciation on implements and farm buildings, interest on working capital, diesel/electricity for operation of pump sets, etc., miscellaneous expenses and imputed value of family labour.

TABLE 2: ANNUAL INCREASE IN MSP SINCE LAST SIX YEARS (IN ₹ PER QUINTAL)

Commodity	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Wheat	1400	1450	1525	1625	1735	1840	1925	1975
Barley	1100	1150	1225	1325	1410	1440	1525	1600
Gram	3100	3175	3500	4000	4400	4620	4875	5100
Lentil (Masur)	2950	3075	3400	3950	4250	4475	4800	5100
Rapeseed & Mustard	3050	3100	3350	3700	4000	4200	4425	4650
Safflower	3000	3050	3300	3700	4100	4945	5215	5327

First Advance Estimates of Production of major Kharif crops for 2020-21 released

The first advance estimates of production of major kharif crops for 2020-21 have been released by the Department of Agriculture, Cooperation and Farmers Welfare on 22nd September, 2020. The assessment of production of different crops is based on the data received from States and validated with information available from other sources. The estimated production of various crops as per the first advance estimates for 2020-21 *vis-à-vis* the comparative estimates for the years 2005-06 onwards is enclosed.

As per first advance estimates, the estimated production of major crops during kharif 2020-21 is as under:

Foodgrains – 144.52 million tonnes. (record)
Rice – 102.36 million tonnes. (record)
Nutri / Coarse Cereals – 32.84 million tonnes.
Maize – 19.88 million tonnes.
Pulses – 9.31 million tonnes.
Tur – 4.04 million tonnes.
Oilseeds – 25.73 million tonnes.
Groundnut – 9.54 million tonnes. (record)
Soyabean – 13.58 million tonnes.
Cotton – 37.12 million bales (of 170 kg each)
Jute & Mesta - 9.66 million bales (of 180 kg each)
Sugarcane – 399.83 million tonnes

The cumulative rainfall during this year's southwest monsoon season upto 16th September, 2020, has been 7 percent higher than long period average. Accordingly, most of the major crops producing states have witnessed normal rainfall. The production of most of the crops for the agricultural year 2020-21 has been estimated higher than their normal production. However, these estimates would undergo revision based on further feedback from the states.

As per first advance estimates for 2020-21 (kharif only), total foodgrain production in the country is estimated at 144.52 million tonnes. The production during 2020-21 is higher by 9.83 million tonnes than the average foodgrain production of

previous five years' (2014-15 to 2018-19).

Total production of kharif rice during 2020-21 is estimated at 102.36 million tonnes. It is higher by 6.70 million tonnes than the previous five years' average production of 95.66 million tonnes.

Production of nutri/coarse cereals is estimated at 32.84 million tonnes is higher by 1.45 million tonnes than the average production of 31.39 million tonnes.

Total kharif pulses production during 2020-21 is estimated at 9.31 million tonnes. It is higher by 1.59 million tonnes than pulses production of 7.72 million tonnes in 2019-20 (fourth advance estimate).

Total kharif oilseeds production in the country during 2020-21 is estimated at 25.73 million tonnes which is higher by 3.41 million tonnes than the production during 2019-20. Moreover, the production of oilseeds during 2020-21 is higher by 5.90 million tonnes than the average oilseeds production.

Total production of sugarcane in the country during 2020-21 is estimated at 399.83 million tonnes. The production of sugarcane during 2020-21 is higher by 39.40 million tonnes than the average sugarcane production of 360.43 million tonnes.

Production of cotton is estimated at 37.12 million bales (of 170 kg each) is higher by 1.63 million bales than the production of 35.49 million bales during 2019-20. Production of jute & mesta is estimated at 9.66 million bales (of 180 kg each).

'Kritagya' Hackathon by National Agricultural Higher Education Project of ICAR

In order to promote potential technology solutions for enhancing farm mechanization with special emphasis on women friendly equipments, a hackathon named "KRITAGYA" has been planned by the Indian Council of Agricultural Research (ICAR) under National Agricultural Higher Education Project (NAHEP). Students, faculties and innovators/entrepreneurs from any university / technical institution across the country can apply and participate in the event in the form of a group.

Dr. Trilochan Mohapatra, Director General, (ICAR) told that in one group maximum 4 participants can compete, with not more than one faculty and/or more than one innovator or entrepreneur. Participating students can collaborate with local start-ups, students from technology institutes, and can win ₹ 5 lakhs, ₹ 3 lakhs and ₹ 1 lakh as first, second and third prize, respectively. The registration for event has already been started from 15th September, 2020.

Dr. Mohapatra said that the development and promotion of women friendly equipments through innovative technology solutions and right collaborations with stakeholders would play an important role in enhancing the farm productivity and profitability, which has also been emphasized by Prime Minister Shri Narendra Modi on several occasions. Shri Narendra Singh Tomar, Union Minister of Agriculture and Farmers Welfare, has also stressed upon the need of enhancing the innovation in farm mechanization in several meeting and provided the overall guidance in organizing this event.

Dr. R. C. Agrawal, Deputy Director General (ICAR) and National Director (NAHEP) told that this event would give an opportunity to the students, faculties, entrepreneurs, innovators and other stakeholders to showcase their innovative approaches and technology solutions to promote farm mechanization in India. The initiative undertaken by NAHEP along with Agricultural Engineering Division of ICAR would also help in enhancing the learning capabilities, innovations and disruptive solutions, employability and entrepreneurial drive in farm mechanization sector. Besides, the event would also help in taking forward the vision of high-quality higher education with equity and inclusion as envisaged in NEP-2020.

He also told that in view of increasing women participation in the field operations mainly due to migration of men for better prospects in non-farm opportunities, the ICAR has felt it necessary to organise this event with the overall aim to enhance automation and mechanization to increase the farm productivity and profitability and also to reduce the drudgery.

The ICAR commenced NAHEP, a Government of India and World Bank project, in November 2017 with the overall objective to support the national agricultural research and education system in providing more relevant and better quality education to the students.

For more details regarding registration and participation, please visit: *https://nahep.icar.gov.in/Kritagya.aspx*

Irrigated Land in the Country

Programmes pertaining to irrigation of agricultural land are planned, funded, executed and maintained by the state governments themselves as per their own resources and priorities. To supplement their efforts and to encourage sustainable development and efficient management of water resources, the central government provides technical and financial assistance to state governments through various schemes and programmes.

Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) was launched during 2015-16, by central government with an overarching vision to ensure access to some means of protective irrigation for all agricultural farms in the country, and to produce 'Per Drop More Crop', thus bringing much desired rural prosperity. Four components of PMKSY are Accelerated Irrigation Benefits Programme (AIBP), Har Khet Ko Pani (HKKP), Per Drop More Crop and Watershed Development. PMKSY not only focuses on creating sources for assured irrigation, but also creating protective irrigation by harnessing rain water at micro level through 'Jal Sanchay' and 'Jal Sinchan'. PMKSY adopts state level planning and projectised execution that allows states to draw up their own irrigation development based on district irrigation plans and state irrigation plans. During 2016-17, ninety-nine (99) on-going major/medium irrigation projects under PMKSY-AIBP, having ultimate irrigation potential of 76.03 lakh hectares and balance estimated cost of ₹ 77,595 crore (central assistance: ₹ 31,342.50 crore) were prioritized in consultation with states, for completion in phases up to December, 2019 along with their Command Area Development & Water Management (CADWM) works. Funding arrangement for both the central & state share has been approved through NABARD under long term irrigation fund.

Under AIBP, total central assistance amounting to ₹ 12224.23 crore has been released for the 99 prioritized projects from 2016-17 to till date. Further, ultimate irrigation potential (UIP) of these projects is 76.03 lakh hectares. Irrigation potential of 41.39 lakh hectares had been created upto 03/16. During 2016-20, additional irrigation potential of 21.33 lakh hectares has been reported to be created through these prioritized projects. Out of the 99 projects, in respect of 8 projects, the states have indicated that either the CAD works are already completed or not envisaged under the present programme. Of the balance 91 projects, 88 projects have been included while for 3 projects detailed project reports are yet to be submitted by states for inclusion. The targeted culturable command area (CCA) of included projects is 45.08 lakh hectares and estimated central assistance is ₹ 8300.00 crore. Total central assistance amounting to ₹ 2652.912 cr was released under CADWM for the 99 prioritized projects from 2016-17 to June 2020 with total reported progress of 14.18 lakh hectares CCA developed.

Surface minor irrigation (SMI) scheme and repair, renovation and restoration (RRR) of water bodies are also being implemented under PMKSY-Har Khet Ko Pani programme. Under SMI, total central assistance amounting to ₹ 2487.95 crore has been released from 2016-17 to till date with total potential achieved 2.32 lakh hectares. Under RRR Scheme, total Central assistance amounting to ₹ 203.77 crore has been released from 2016-17 to till date with total potential achieved 0.83 lakh hectares.

The Ministry of Agriculture and Farmers Welfare implements Per Drop More Crop (PDMC) component of PMKSY which focuses on water use efficiency at farm level through precision/micro irrigation. Besides promoting precision irrigation (Drip and Sprinkler Irrigation System) and better on-farm water management practices to optimize the use of available water resources, this component also supports micro level water storage or water conservation/management activities to supplement micro irrigation.

Central assistance released and area covered under PDMC during the last three years is given in the following table:

Year	Released (₹ in crore)	Achievement (coverage of micro irrigation) (lakh hectares)
2017-18	2819.49	10.48
2018-19	2918.38	11.58
2019-20	2700.01	11.72

Source: DAC&FW, Ministry of Agriculture & Farmers Welfare
NOTE: During 2020-21, ₹ 4000.00 crore are allocated for the programme.

Benefits of Agricultural Schemes to Farmers

Agriculture is a state subject. Government of India facilitates the state governments through many centrally sponsored and central sector schemes to increase production, to reduce cost of cultivation like Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), Soil Health Card Scheme, Sub-Mission on Agricultural Mechanisation, etc.

Under Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), 4592137 farmers have benefitted since 2015-16 till date. While a comprehensive study regarding these issues is not available, according to evaluation carried out in respect of some schemes the following is brought out:

Soil Health Card Scheme

As per feedback received from farmers from 21 states covering 171 districts, it emerged that application of fertilizers as per the recommendation of soil health cards led to savings in nitrogen fertilizers like urea, thereby resulting in reduction in cost of cultivation.

i. Rice – the cost of cultivation is reduced by 16-25% and savings of nitrogen are found to be around 20 Kg per hectare.

ii. Pulses – 10-15 percent reduction in cost of cultivation and savings of 10 Kg per hectare of urea is observed.

iii. Oil Seeds – reduction in cost of cultivation is 10-15 percent and savings on nitrogen are 9 Kg/acre in sunflower, around 23 kg/acre in ground nut and around 30 kg/acre in castor.

iv. Cash crops – in case of cotton, reduction in cost of cultivation is 25 percent and savings on nitrogen fertilizer is around 35 kg/acre.

v. Horticulture crops- In potato, 46 kg/acre of nitrogen saving is observed.

Judicious use of fertilizers also resulted in increased production of crops

i. Cereals-increase in production of 10-20 percent in paddy, 10-15 percent in wheat and Jowar.

ii. Pulses-Increase in production of 10-30 percent in pulses.

iii. Oilseeds- Increase in production of around 40 percent in oilseeds.

iv. Cotton- Increase in production of around 10-20 percent in cotton.

Savings on fertilizers and increase in production also resulted in increased income to farmers

i. Paddy: Increase in income of around ₹ 4500/- per acre.

ii. Tur: Increase in income of ₹ 25000-30,000/- per acre

iii. Sunflower: Increase in income of around ₹ 25000/- per acre

iv. Groundnut: Increase in income of around ₹ 10000/- per acre

v. Cotton: Increase in income of around ₹ 12000/- per acre

vi. Potato: Increase in income of around ₹ 3000/- per acre.

Micro Irrigation

An impact evaluation study for micro irrigation completed in the 2014 and major findings of the study are:

i. Irrigation cost reduced by 20 percent to 50 percent with average of 32 percent.

ii. Electricity consumption reduced by about 31 percent.

iii. Saving of fertilizers varies from 7 percent to 42 percent.

iv. Average productivity of fruits and vegetables increased by about 42.3 percent and 52 percent.

v. Overall income enhancement of farmers was in the range of 20 percent to 68 percent with average of 48.5 percent.

The DAC&FW has recommended to the Department of Revenue to review the GST rates imposed on agriculture relevant inputs, equipment, appliances, machinery, etc., and take necessary steps

to reduce the same to a reasonable level of either 'Nil' or at the 5 percent.

Agricultural Imports

Major agro products imported in the country are edible vegetable oils, pulses, fresh fruits, raw cashew nuts, raw sugar, raw cotton and spices which, in value terms, constitute nearly 84 percent share in India's total agri imports.

India has surplus in Agri Trade. The major imports are vegetable oils and National Mission for Oilseeds and Oil Palm is being implemented to address it. Enhanced production and productivity of crops is one of the most important measures to reduce dependency on agricultural imports. As such, for increasing production and productivity of agro products including oilseeds, foodgrains, pulses, fruits and spices, etc., government implements various programmes/schemes, *viz*., Rashtriya Krishi Vikas Yojana (RKVY), National Food Security Mission (NFSM), NFSM- oil seeds and oil palm, Bringing Green Revolution to Eastern India (BGREI), Mission for Integrated Development of Horticulture (MIDH), Pradhan Mantri Krishi Sinchai Yojana (PMKSY), Soil Health Card, etc. In addition, Indian Council of Agricultural Research (ICAR) and state agricultural universities have developed a number of improved varieties/hybrid seeds to enhance production and productivity.Under the NFSM (Oilseeds & Oil Palm) assistance is being provided to the farmers on various items such as certified seed distribution, planting material, demonstrations, IPM, INM, PP chemicals, various farm implements, training of farmers, irrigation devices and local initiatives to increase oilseeds production.

Cold Storage Facilities in the Country

As per available information, there are 8186 number of cold storages with capacity of 374.25 lakh MT, is available in the country for storing perishable horticulture produce like fruits and vegetables. The information regarding capacity utilization, real time data regarding availability, cost, etc., on cold storage facilities for farmers and traders, etc., is not centrally maintained by the Ministry. There is no real-time monitoring System.

A study on All India Cold-chain Infrastructure Capacity (AICIC-2015) carried out by NABARD Consultancy Service (NABCONS) assessed requirement of 350 lakh MT capacity of cold storage for perishable fruits and vegetables. Currently, there is 374.25 lakh MT capacity of cold storages is available in the country.

Government is implementing following schemes under which financial assistance is provided for setting up of cold storages throughout the country to bridge the gap between availability and required cold storage capacity:

i. Mission for Integrated Development of Horticulture (MIDH)

Department of Agriculture Cooperation & Farmers Welfare is implementing mission for Integrated Development of Horticulture (MIDH) under which financial assistance is provided for various horticulture activities including setting up of cold storages. The component is demand/entrepreneur driven for which government's assistance in the form of credit linked back ended subsidy is available at the rate of 35 percent (for general areas) and 50 percent (for hilly and scheduled areas) of eligible capital cost of the project for both public and private sector enterprises.

ii. Pradhan Mantri Kisan SAMPADA Yojana (PMKSY)

Ministry of Food Processing Industries is implementing the Scheme for Integrated Cold Chain and Value Addition Infrastructure as one of the component of Pradhan Mantri Kisan Sampada Yojana (PMKSY) with the objective of reducing post-harvest losses of horticulture & non-horticulture produce and providing remunerative price to farmers for their produce. Under the scheme, Ministry provides financial assistance in the form of grant-in-aid at the rate of 35 percent for general areas and 50 percent for north east states, Himalayan states, ITDP areas and islands for storage and transport infrastructure and at the rate of 50 percent and 75 percent, respectively, for value addition and processing infrastructure subject to a maximum of ₹ 10 crore per project for setting up integrated cold chain projects including irradiation facility. Stand-alone cold storages are not covered under the Scheme.

Startups in Agriculture Sector

Department of Agriculture, Cooperation & Farmers Welfare (DAC&FW) has launched a new component called "Innovation and Agri-Entrepreneurship Development" under Rashtriya Krishi Vikas Yojana (RKVY-RAFTAAR) in 2018-19 with objective to promote innovation and agripreneurship by providing financial support and nurturing the incubation ecosystem. Start-ups are being encouraged in order to contribute directly and indirectly to enhance the income of farmers by providing opportunities to them and to provide employment to youth.

In this connection, five Knowledge Partners (KPs) and twenty four Agribusiness Incubators (R-ABIs) have been appointed by DAC &FW to advice on smooth and efficient execution of this programme in various states.

Under this programme, for idea/pre-seed stage, a selected startup shall be eligible for a maximum financial assistance of ₹ 5 lakh. For seed stage, a selected startup shall be eligible for a maximum financial assistance of ₹ 25 lakh.

346 startups in the agriculture and allied sectors are selected for funding a sum of ₹ 36.72 crore in installments and ₹ 16.01 crore has been released as 1st installment. These startups were trained for two months at various agribusiness incubation centers (*i.e.,* KPs & RABIs) spread across the country.

Technology License Agreement on "Brucella abortus S19Ä per vaccine" between ICAR- Indian Veterinary Research Institute (IVRI) and Hester Biosciences Limited

A Technology License Agreement (TLA) ceremony on "*Brucella abortus* S19Ä per vaccine" developed by ICAR-Indian Veterinary Research Institute (IVRI) was held on 22nd September, 2020 through virtual platform. The TLA was between Dr. R.K. Singh, Director (ICAR-IVRI, Izatnagar), Mr Rajiv Gandhi, (CEO and MD, Hester Biosciences Limited, Ahmedabad), Ms Anju Bhalla, MD, DBT- Biotechnology Industry Research Assistance Council (BIRAC) and Dr. Sudha Mysore, CEO, Agrinnovate India Limited. The ceremony was graced by Dr. Trilochan Mohapatra, Secretary (DARE) & DG (ICAR), Dr. Renu Swarup, Secretary (DBT and Chairperson, BIRAC), Dr. B. N. Tripathi, DDG (Animal Science) and other dignitaries and officials from ICAR-IVRI, DBT, BIRAC, BCIL, DAHD and Hester Biosciences Limited.

During the ceremony, Dr. T. Mohapatra, DG (ICAR) emphasized the importance of the Brucella vaccine in India and its perspective abroad. He also highlighted its economic, social and developmental impact. He further complimented the inventor of the technology and director of the institute for this significant achievement. The technology was developed by the scientists of ICAR-IVRI, Dr. Pallab Chaudhari and his team. Dr. Renu Swarup, Secretary, DBT also congratulated the inventor and his team and to ICAR, and stressed on more collaboration between ICAR and DBT to brings out more technologies for transfers which are at the development stage. The vaccine has great demand in India and would be of immense help in the national control programme on brucellosis. The vaccine has DIVA capability meaning that it can differentiate between naturally infected and vaccinated animals.

Brucellosis is one of the most important zoonotic diseases worldwide and also endemic in India causing huge economic losses to dairy industry due to infertility, abortion, birth of weak offspring and reduced productivity. In India, calf-hood vaccination is practiced using live attenuated *B. abortus* S19 strain for control of the disease. *B. abortus* S19 strain is a very strong immunogen and provides lifelong immunity. However, this vaccine strain has several drawbacks like – residual virulence to human and animals, not suitable for vaccination in adult animals, causes abortion when used in pregnant animals and also interferes with sero-diagnosis of clinical infection.

To overcome some of these drawbacks, a modified strain of *B. abortus* S19 has been developed at ICAR-IVRI. The vaccine candidate was developed under DBT funded "Brucellosis network program". In the process of modifying the S19 strain, lipopolysaccharide (LPS) structure of the organism was altered through deletion mutation. The newly developed strain was named as *B. abortus* S19Äper. Vaccine potential of S19Äper has been evaluated in experimental small animal model and also in buffalo calves.

Union Minister for Agriculture and Farmers Welfare, Shri Narendra Singh Tomar launched "Centralized Farm Machinery Performance Testing Portal" in the Public Domain

Union Minister for Agriculture and Farmers Welfare,

Shri Narendra Singh Tomar, on 22nd September, 2020, launched in the public domain, the "Centralized Farm Machinery Performance Testing Portal" which has been developed by the Department of Agriculture, Cooperation and Farmers Welfare as a further step to improve services of farm machinery testing institutions and bringing out transparency in the entire process of testing and evaluation of machines.

Speaking on the occasion, Shri Narendra Singh Tomar said that the Government under Prime Minister Shri Narendra Modi is fully committed to the welfare of farmers and development of the agriculture sector. Budget allocation of the agriculture sector has also been considerably increased in keeping with this commitment of the government. Shri Tomar said that there has been significant increase in adoption of agricultural machines which has resulted in the phenomenal expansion of cropped area, cropping diversity and the country's agricultural production. Further, to promote agricultural mechanization, the union agriculture minister appealed to industry representatives to design farm equipment which can be utilized in cost effective manner by small and marginal farmers.

This portal would facilitate manufacturers in applying, communicating and monitoring the progress of testing of their machines in a seamless manner as it is easily accessible from any location and from any device connected to the internet. It offers the possibility of integrated management in a unified manner within the organization and thus would help in improving the efficiency of the testing institutes, thereby reducing testing time for various agricultural machines and equipments. This portal offers following benefits to the users, *viz.*, manufacturers, FMTTIS and the DAC&FW:

i. In line with government policy of "Ease of Doing Business", this would facilitate applying for testing of machinery online.

ii. Ensure transparency in the entire processes of testing.

iii. Faster feedback

iv. Help in reducing testing time

v. Reduced business expenses of agricultural manufacturers

vi. Testing efficiency improvement

vii. Thoroughness in testing

viii. Flexible access – officers concerned at ministry and manufacturers can monitor testing activities from anywhere with internet access.

Agricultural mechanization is a central indispensable support to make farm operations efficient and productive. It contributes in increasing the efficiency and productivity of all direct as well as indirect inputs used in the crop production system besides, reduction in drudgery associated with various farm operations.The programs and schemes of the government of India on farm mechanization have resulted in progressive increase in the availability of farm power per unit area for performing various agricultural operations. The shift has also helped in diversification of agriculture from conventional crops to commercial crops.

Testing of farm machines is important aspect of agricultural mechanization which benefits both buyers, *i.e.,* farmers as well as to the manufacturers of agricultural machinery. Testing and evaluation of agricultural machinery encourages improvement in quality and functional suitability. Comparable data for similar machines is available to manufacturers, which help them in improving the design of their product and open up avenues in commercialization of agricultural machinery not only on national level but also globally. Recognizing the importance of testing and evaluation of agricultural machinery and to meet the increasing demand for testing, the Department of Agriculture, Cooperation and Farmers Welfare in addition to the existing four farm machinery training & testing institutes, has identified and authorized 35 institutions under the state agricultural universities, Indian Council of Agricultural Research and the state governments.

The Farm Machinery Training & Testing Institutes at Budni (MP), Hisar (Haryana), Anantpur (Andhra Pradesh) and Biswanath Chariali (Assam) are playing an important role and contributing their share to the development and progressive acceptance of agricultural mechanization in India through their capacity building programmes, testing & evaluation of farm machinery and demonstration of machines/technologies on the farmer's fields. The Budni institute is national designated authority for testing of tractors as per OECD standards. The Budni

and Hisar institutes are also recognized for testing of tractors and self-propelled machines under the central motor vehicle rules.

1116.88 lakh ha area sown compared to 1066.06 lakh ha area during Kharif season of corresponding period last year

Ministry of Agriculture and Farmers Welfare and state governments have put all efforts in successful implementation of mission programs and flagship schemes. The timely prepositioning of inputs by government of India like seeds, pesticides, fertilizers, machinery and credit has made it possible for large coverage during pandemic lockdown conditions. There is no impact of COVID-19 on progress of area coverage under kharif crops as on 25th September, 2020. Credit goes to farmers for timely action and adoption of technologies and taking benefit of government schemes.

Progress of area coverage reported is 1116.88 lakh ha area compared to corresponding period of last year 1066.06 lakh ha. The final sowing figures for kharif season are expected to be closed on 1st October, 2020.

Rice: Sowing of rice has been reported on 407.14 lakh ha compared to 385.71 lakh ha during the corresponding period of last year, *i.e.,* increase in area coverage by 5.56 percent.

Pulses: Pulses on 139.36 lakh ha against 133.94 lakh ha area of last year, *i.e.,* increase in area coverage by 4.05 percent.

Coarse Cereals: Coverage of coarse cereals reported on 183.01 lakh ha area against 180.35 lakh ha area of last year, *i.e.,* increase in area coverage by 1.47 percent.

Oilseeds: Oilseeds 197.18 lakh ha area against 179.63 lakh ha area of last year, *i.e.,* area coverage increased by 9.77 percent.

Sugarcane: Sugarcane on 52.84 lakh ha area against 51.89 lakh ha area of last year, *i.e.,* increase in area coverage by 1.83 percent.

Cotton: Cotton area coverage reported on 130.37 lakh ha area against 127.67 lakh ha area of last year, *i.e.,* increase in area coverage by 2.11 percent.

Jute & Mesta: Jute & Mesta on 6.98 lakh ha area against 6.86 lakh ha area, *i.e.,* increase in area coverage by 1.78 percent reported in the country.

Union Minister for Agriculture & Farmers Welfare, Shri Narendra Singh Tomar inaugurates Indian Agricultural Research Institute, Assam campus at Gogamukh

Union Minister of Agriculture & Farmers Welfare, Rural Development, Panchayati Raj & Food Processing Industries, Shri Narendra Singh Tomar, dedicated to the nation the campus of the new Indian Agricultural Research Institute, Gogamukh, Assam on 25th September, 2020. Speaking on the occasion, Shri Narendra Singh Tomar announced that the IARI, Assam would be named after Pt. Deen Dayal Upadhyaya. The minister said that as visualized by Prime Minister Shri Narendra Modi, the setting up of this institute would give an impetus to development of agricultural education and research in the states of Arunachal Pradesh, Meghalaya, Manipur, Mizoram, Nagaland, Tripura and Sikkim, in addition to Assam. By the year 2050, the population of the country and the challenge of climate change would increase considerably. The government is working in the direction that the country's agricultural sector remains strong to be able to meet these challenges and there is sufficient food reserves at all times.

Appreciating the lead role played by the country's agricultural scientists in bringing about the green revolution by developing several high yielding seed and crop varieties, Shri Tomar said that the country is now not only self-sufficient but also surplus in foodgrains production. The government has made efforts to plug the gaps in the development process, and as a result new agricultural research institutes have been established in Jharkhand and Assam. Sikkim is now a totally organic state, and other states are also progressing in this direction. The minister stressed that in view of the challenge of climate change and water scarcity, it is important to undertake crop diversification and develop varieties which require less water to grow. He also emphasised the importance of locally grown crops for enhancing farmers' income and export opportunities.

Chief Minister of Assam, Shri Sarbanand Sonowal thanked the Hon'ble Prime Minister for the establishment of IARI, Assam and expressed hope that the Institute would be able to fulfil its objectives. He emphasized on the research activities on locally

grown horticultural crops of the region for enhancing farm income of small and marginal farmers through enterprise diversification. He also hoped that the north-eastern states would be again known as "Bowl of Rice" with the support of ICAR-IARI, Assam. Union Minister of State for Agriculture, Shri Kailash Choudhary, (Director General, ICAR), Dr. Trilochan Mohapatra, public representatives, scientists and government officials were present at the inauguration ceremony. The report of the institute was presented and emphasised on water use efficiency from June to September in the north-eastern region and organic farming of local grown crops.

NITI Aayog Holds Two-Day Consultation on Natural Farming

To leverage the many socio-economic and environmental benefits of natural farming for boosting farmers' welfare, consumer health, food security and nutrition, NITI Aayog has organized a two-day (29–30 September) national-level consultation with relevant stakeholders.

Addressing the conference, Union Minster of Agriculture and Farmers Welfare, Shri Narendra Singh Tomar stressed that natural farming has been practised in India over the centuries, and lauded NITI Aayog's efforts to spearhead the implementation of natural farming across the country. He mentioned that the union agriculture ministry has allocated a budget to promote the practice. Proposals on natural farming by Andhra Pradesh, Kerala and Chhattisgarh have also been considered and approvals accorded for their implementation.

Governor of Gujarat, Acharya Devvrat said that in the next five years, 12 lakh hectares would be brought under natural farming in the state. He mentioned that approximately 1.20 lakh farmers in Gujarat adopted natural farming during the ongoing kharif season and another 5.50 lakh were interested in the practice. The governor enumerated on the many benefits of the practice—the input cost in natural farming tends to be 'zero'; the requirement of irrigation is reduced to 60–70 percent, with an increase in organic carbon level from 0.5 to 0.9. The marketing of such produce faces no constraints, where the unit price of premium quality wheat can be marketed at ₹ 4000 per quintal instead of the conventional rate of ₹ 1900.

Applauding the efforts of the Agriculture Ministry to publicize the beneficial aspects of natural farming, NITI Aayog VC, Dr. Raijv Kumar mentioned that currently the acceptance and adoption of the practice is still in a transitionary stage. However, India looks forward to the implementation of natural farming as a *jan andolan*, keeping pace with the science to back it, to emerge as a net agri-exporter. NITI Aayog Member (Agriculture), Prof. Ramesh Chand mentioned that the issues related to the creation of a new policy environment, product identity, value chain and marketing would be taken care of as a future course of action. Emphasizing on the importance of agriculture in economic development, NITI Aayog CEO, Shri Amitabh Kant said there was a need to build a common understanding and workable strategies to push natural farming to maintain continuity in the food supply system.

The two-day consultation has four technical sessions—natural farming (national and global perspectives); natural farming for pan-India adoption and success stories; natural farming (adoption and impact evaluation); and natural farming (farmers' organization, experiences, and challenges)—headed by NITI Aayog Member (Agriculture) Prof. Ramesh Chand; Acharya Devvrat; and Kaadsiddeshwar Swami Ji, Kaneri Math, Kolhapur.

The consultation hopes to deliver a systematic approach for the adoption and implementation of natural farming at the farm level; identify an extension-cum-training programme to be undertaken by the Indian Council of Agricultural Research through Krishi Vigyan Kendras, state agriculture departments, the private sector, cooperatives and NGOs; and develop a document on success stories/ best practices, with the scientific background required to manage crop health and production.

Central and state government officials, scientists and experts from agriculture universities and institutions, trusts and NGOs associated with natural farming, and representatives from international organizations and farmers' associations are part of the consultation.

Government continues to procure crops at MSP from farmers as per its existing MSP Schemes as done in previous seasons

The arrival of kharif marketing season 2020-21 has just begun and the government continues to procure

kharif 2020-21 crops at MSP from farmers as per its existing MSP Schemes as done in previous seasons.

Based on the proposal from the States, approval accorded for procurement of 14.09 LMT of Pulse and oilseeds for kharif marketing season 2020 for the States of Tamil Nadu, Karnataka, Maharashtra, Telangana and Haryana. For other States/UTs approval would also be accorded on receipt of proposal for kharif pulses and oilseeds and procurement of FAQ grade would be made as per Price Support Scheme (PSS), if the market rate goes below its MSP during the notified harvesting period.

Upto 29.09.2020, the government through its nodal agencies has procured 46.35 MT of moong having MSP value of ₹ 33 lakhs benefitting 48 farmers in Tamil Nadu. Similarly, 5089 MT of copra (the perennial crop) having MSP value of ₹ 52.40 crore has been procured benefitting 3961 farmers in Karnataka and Tamil Nadu against the sanctioned quantity of 1.23 LMT for the Andhra Pradesh, Karnataka, Tamil Nadu and Kerala.

The procurement of paddy during kharif marketing season 2020-21 has started from 26.09.2020 in Haryana and Punjab. Upto 29.09.2020, the paddy procurement of 3,506 MT in Haryana and 41,303 MT in Punjab totaling 44,809 MT having MSP value of 84.60 crore at MSP of ₹ 1888 per quintal has been done from 2950 farmers of Haryana and Punjab.

The procurement of cotton for the season 2020-21 shall commence from 1st October, 2020 and Cotton Corporation of India (CCI) would start purchase of FAQ grade cotton from 1st October, 2020 onwards.

General Survey of Agriculture

Production Scenario as per First Advance Estimates 2020-21

As per First Advance Estimates for 2020-21 (Kharif Only), total food grain production in the country is estimated at 144.52 million tonnes. Total production of kharif rice during 2020-21 is estimated at 102.36 million tonnes. Production of nutri / coarse cereals is estimated at 32.84 million tonnes. Total kharif pulses production during 2020-21 is estimated at 9.31 million tonnes. Total kharif oilseeds production in the country during 2020-21 is estimated at 25.73 million tonnes. Total production of sugarcane in the country during 2020-21 is estimated at 399.83 million tonnes. Production of cotton is estimated at 37.12 million bales (of 170 kg each). Production of jute & Mesta is estimated at 9.66 million bales (of 180 kg each).

Minimum Support Prices (MSP) for Rabi Crops of 2020-21 Season

The Government has increased the Minimum Support Prices (MSPs) for mandated Rabi Crops for RMS 2021-22 on 21st September, 2020. The details of MSPs for Rabi crops for RMS 2021-22 are as under:

(₹ per quintal)

Commodity (Fair Average Quality)	Minimum Support Price
Wheat	1975
Barley	1600
Gram	5100
Masur (Lentil)	5100
Rapeseed and Mustard	4650
Safflower	5327

The highest increase in MSP has been announced for lentil (₹ 300 per quintal) followed by gram and rapeseed & mustard (₹ 225 per quintal each) and safflower (₹ 112 per quintal). For barley and wheat, an increase of ₹ 75 per quintal and ₹ 50 per quintal respectively has been announced. The differential remuneration is aimed at encouraging crop diversification.

The increase in MSP for Rabi Crops for marketing season 2021-22 is in line with the principle of fixing the MSPs at a level of at least 1.5 times of the All-India weighted average Cost of Production as announced in Union Budget 2018-19. The expected returns to farmers over their cost of production are estimated to be highest in case of Wheat (106%) followed by rapeseed & mustard (93%), gram and lentil (78%). For barley, return to farmers over their cost of production is estimated at 65% and for safflower, it is 50%.

A) The Agro-Economic Research (AER) Scheme, initiated in 1954-55, is a network of 15 AER Centres/ Units which conduct research studies in the field of Agricultural Economy on yearly basis as per need of the Government of India. Currently, these AERCs/ Us are being funded under the Integrated Scheme on Agriculture Census, Economics & Statistics (Component No. IV –AERC) of Central Sector Scheme.

AER Centers/Units have completed 01 study in the month of September 2020 (Village survey study in Khatingya village in Allahabad, UP on development of agriculture).

Trends in Foodgrain Prices

Based on Wholesale Price Index (WPI) (2011-12=100), WPI in case of foodgrains increased by 0.19 percent in August, 2020 over August, 2019.

Among foodgrains, WPI of pulses and vegetables increased by 9.86 percent and 7.03 percent, respectively and cereals and fruits decreased by 1.79 percent and 0.25 percent in August, 2020 over August, 2019.

Among cereals, WPI for paddy increased by 2.49 percent and WPI of wheat decreased by 1.47 percent in August, 2020 over August, 2019.

Similarly, WPI in case of foodgrains decreased by 1.05 percent in August, 2020 over July, 2020.

Among foodgrains, WPI of fruits and vegetables increased by 5.51 percent and 1.53 percent, WPI of cereals decreased by 1.30 percent and there is no change in WPI of pulses in August, 2020 over July, 2020.

Among cereals, WPI for paddy and wheat

decreased by 0.66 percent and 2.10 percent in August, 2020 over July, 2020.

Rainfall and Reservoir Situation, Water Storage in Major Reservoirs

Cumulative monsoon season, 2020 rainfall for the country as a whole during the period 1st June, 2020 to 30th September, 2020 has been 9% higher 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 29% in South Peninsula, by 15% in Central India and by 6% in East & North East India but lower than LPA by 16% in North-West India. Out of 36 meteorological sub-divisions, 15 meteorological sub-divisions received large excess/excess rainfall, 16 meteorological sub-divisions received normal rainfall and 5 meteorological sub-divisions received deficient/large deficient rainfall.

Out of 685 districts for which rainfall data available, 59(9%) districts received large excess rainfall, 164(24%) districts received excess rainfall, 290(42%) districts received normal rainfall, 155(23%) districts received deficient rainfall and 17(2%) districts received large deficient rainfall.

Current live storage in 123 reservoirs (as on 24th September, 2020) monitored by Central Water Commission having Total Live Capacity of 171.09 BCM was 147.29 BCM as against 148.30 BCM on 24.09.2019 (last year) and 128.21 BCM of normal storage (average storage of last 10 years). Current year's storage is 99% of last year's storage and 115% of the normal storage.

As per 1st Advance Estimates 2020-21, around 102.3% of the normal area under kharif crops has been sown. During 2020-21, total area sown under Kharif crops in the country has been reported to be 1095.37 lakh hectares as compared to 1085.65 lakh hectares during 2019-20 (4th Adv. Estimates).

A statement indicating comparative position of area coverage under major crops as per 1st Advance Estimates during 2021-21 *vis-a-vis* the area coverage during the 4th Advance Estimates 2019-20 is given in the **Annexure 1**.

Annexure 1: All India Kharif Crop Situation - 2020-21 (1st Adv. Est.) *vis-à-vis* 2019-20 (4th Adv. Est.)

(In lakh ha.)

Crop Name	Normal Area for whole Kharif Season(DES)	Area sown reported			Absolute Change over 2019
		1st Advance Estimates 2020-21	% of Normal for whole season	4th Advance Estimates 2019-20	
Rice	397.29	401.05	100.9	390.19	10.86
Jowar	20.56	16.59	80.7	17.07	-0.48
Bajra	72.98	67.08	91.9	75.21	-8.12
Maize	74.70	77.69	104.0	76.84	0.85
Total Coarse Cereals	**184.85**	**176.17**	**95.3**	**183.78**	**-7.61**
Total Cereals	**582.14**	**577.22**	**99.2**	**573.96**	**3.25**
Tur	44.29	46.16	104.2	45.43	0.73
Urad	35.53	37.50	105.6	36.55	0.95
Moong	30.49	35.04	114.9	34.76	0.28
Others	18.58	16.45	88.5	17.30	-0.85
Total Pulses	**128.88**	**135.15**	**104.9**	**134.04**	**1.11**
Total Foodgrains	**711.03**	**712.36**	**100.2**	**708.00**	**4.36**

Annexure 1: All India Kharif Crop Situation - 2020-21 (1st Adv. Est.) *vis-à-vis* 2019-20 (4th Adv. Est.)-*Contd.*

(In lakh ha.)

Crop Name	Normal Area for whole Kharif Season(DES)	Area sown reported			Absolute Change over 2019
		1st Advance Estimates 2020-21	% of Normal for whole season	4th Advance Estimates 2019-20	
Groundnut	41.41	49.27	119.0	41.31	7.96
Soyabean	110.32	120.60	109.3	120.91	-0.32
Sunflower	1.64	1.26	76.8	1.28	-0.02
Sesamum	16.73	15.26	91.2	16.21	-0.95
Nigerseed	2.23	1.81	81.2	1.37	0.44
Castorseed	9.07	8.42	92.9	10.47	-2.05
Total Oilseeds	**181.39**	**196.61**	**108.4**	**191.54**	**5.07**
Cotton	122.27	129.57	**106.0**	133.69	-4.12
Sugarcane	48.46	49.93	103.0	45.67	4.26
Jute & Mesta	7.60	6.90	90.7	6.75	0.15
All- Crops	**1070.75**	**1095.37**	**102.3**	**1085.65**	**9.72**

Source: DES

Articles

SWOT Analysis of Hill Agriculture: A Study of Western Himalayan State of Himachal Pradesh

S.P. SARASWAT[1], PREM SINGH DAHIYA[2] AND HEMANT SHARMA[3]

Abstract

The present study has been conducted for Himachal Pradesh of Western Himalayan region with the objectives to analyze mainly the strengths, weaknesses, opportunities and threats (SWOT) of hill agriculture in the state of Himachal Pradesh during the five year plan periods since 1951-52. The study included the planning aspects of agriculture, horticulture and animal husbandry, constraints faced and areas of intervention in the state in respect to total outlay and respective allocation during the different plan periods. In order to make green revolution period a movement, the outlay was enhanced in the fourth plan period to about 3.5 times that of the third plan. Similarly, the economic reforms period started in the VIIIth plan period with an enhancement of outlay to about 2.5 times that of the previous plan. Interestingly, in the VIth plan period the allocation made was almost 4.4 times that of the Vth plan, which is an indication of more thrust for the green revolution movement. Based on SWOT analysis it is suggested that the policy makers should devise ways to increase the share of producers in consumer's price to about 60 to 70 percent. The State should concentrate in agriculture sector with added emphasis on the development, off-season vegetables, cash crops and organic manure based farming. In horticulture sector the emphasis should be on forest-based plants like medicinal herbs and aromatic plants, spices, dry fruits, flowers, conventional and unconventional fruits for diversified farming. While in case of livestock sector, more useful programs like better breeding, feeding and disease control should be encouraged along with the improvement in pasture land.

Keywords: *Himachal Pradesh, agriculture, strengths, weaknesses, opportunities, threats.*

1. Introduction

In Himachal Pradesh, the era of economic development started in 1948, in the form of five year plans initiated during 1951-56. During the first five year plan 50 percent of resource allocation was spent on infrastructure related to transport facilities for planned development in the state. The community development programme was launched in 1952 in certain selected areas of Himachal Pradesh which was later extended to the entire rural area of the state. In Mandi and Kangra, package programmes were undertaken in collaboration with the then West Germany for popularizing modern techniques of cultivation among the farmers. Suitable agricultural machinery and animal husbandry were introduced in these areas. Well-equipped soil testing laboratories, dairy farms and agricultural workshops were set up at various centres, besides an agriculture university at Palampur. Himachal Pradesh is one of those states in India which was rapidly transformed from the most backward part of the country to one of the most advanced states. At present the State ranks fourth in respect of per capita income among all the states of India.

The education system in the state is well established. Agriculture development has ensured almost self-sufficiency. Its horticulture growth is highly impressive in the country. Besides, its road connectivity system has emerged as the best in the mountainous areas in India. The infrastructure for its industrial development is well laid out and its rich forest resources are being augmented and above all, the increasing attention of the nation towards the exploitation of its hydel resources is the sign for its

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bright future. It has already become a role model in respect of development for the hill areas of the country.

The main cereals grown in the State are wheat, maize, rice and barley. Kangra, Mandi and Paonta valley of Sirmaur district (to some extent) are the major producers of the first three cereals (wheat, maize and rice), while barley is mostly cultivated in Shimla. Fruit cultivation has also proved to be an economic boon to the State. There are huge tracts of land suitable for growing fruits. The yield per acre in terms of income is also much higher. Apple generates the maximum income. Fruit growing in the state is fetching over ₹ 3 billion annually. Special efforts are being made to promote cultivation of crops like olives, figs, hops, mushrooms flowers, pistachio nuts, sarda melon and saffron. The state has also earned the name of the 'Apple State of India'.

Agriculture has an important place in the economy of Himachal Pradesh. As it is the single largest sector of the state economy providing direct and indirect employment to about 75 percent population and contributes more than 13.7 percent of gross state domestic product (GSDP) of the state. That is how this sector continues to receive priority attention from the State Government in resource allocation.

Under the planning era, agriculture is divided into three sectors, namely, agriculture sector, horticulture sector and livestock/animal husbandry sector. In agriculture and horticulture sectors, the main emphasis has been on a shift from self-sufficiency in food grains to maximization of farm income through cash crops like fruits and vegetables, particularly the off-season crops, vegetables, dry fruits, etc. These are highly remunerative farm enterprises for which the State has an added advantage due to typical climatic conditions spread over different terrains along with some other factors. In the livestock sector, substantial quality improvement has been achieved through encouraging various programmes, such as better breeding, feeding, pasture land and disease control. It has further enhanced the income of the rural households.

There has been substantial contribution from different five year plans since 1951-52. In this context, however, the planners failed to give the much needed regional focus for planned development in the context of distinct physical features and environmental conditions of the state. Nevertheless, sectoral priorities have shifted from one plan to another. The highest priorities were given to the development of infrastructure, transport and communications upto fourth plan, after which the priorities were water and power development, which made agriculture and allied sectors to attain the second position in the overall state economy.

In the present paper we plan to essentially review the present status of agriculture in the State along with the efforts made by the government and non-government agencies to compensate for the weaknesses, availing the opportunities and meeting the threats, building the socio-economic welfare on various aspects of different sectors in the state.

1.1. Objectives of the study

The objective of the present paper is to study

(i) The SWOT analysis of agriculture, horticulture and animal husbandry.

(ii) The thrust areas of planning of agriculture, horticulture and animal husbandry.

(iii) The constraints and areas of intervention in agriculture, horticulture and animal husbandry in Himachal Pradesh.

(iv) The outlay during different plan periods for agriculture sector and to suggest measures for improvement.

2. Methodology

The present study is based on different published and unpublished data and information. The contribution of different five year plans over the past six decades had a large influence on the present pattern of socio-agro-economy of the state. The information regarding plan objectives, strategies, programmes and outlay are obtained from five year plan documents of state planning department and other concerned departments of the State Government. Various survey reports and books brought out by Agro Economic Research Centre, Himachal Pradesh University, Shimla and institutes/universities in the state have also been quite helpful.

3. Results and Discussion

3.1. SWOT analysis for agriculture, horticulture and animal husbandry sector

To analyse the agro-sector in the State in totality, one has to undertake a SWOT analysis covering different aspects in view of the changes that are rapidly taking place in the field of production technologies and marketing opportunities. This SWOT analysis has been presented in table 1, 2 & 3 for agriculture, horticulture and animal husbandry sector, respectively.

TABLE 1: SWOT ANALYSIS OF AGRICULTURE SECTOR IN HIMACHAL PRADESH

Strengths	Weaknesses
i. Production of all kind of crops, diverse agro-climatic conditions, temperate to subtropical ii. Production of vegetables, seed potato, ginger, etc., when no local supply in market in plains. iii. Vast domestic market for hill vegetables, other crops and medicinal plants in the country iv. Well-developed framework for research, extension, marketing, processing and communication. v. Nearness to wholesale market at Delhi, Chandigarh and other markets of plains.	i. Lack of irrigation facilities, water resources, small & scattered land holdings. ii. Unpredictable weather, frost, hail storm, drought, post-harvest losses/ wastage. iii. Lack of scope for mechanization to save labor cost, gaps in application of technology for increasing production and quality due to hostile climate, difficultterrain, poor communication. iv. High cost of marketing due to transportation. No organized system through cooperatives.v. Commercial production of only a few crops/ vegetables.
Opportunities	**Threats**
i. Diversification towards high value low volume crops, spices, off-season vegetables, niche-based crops, organic crops production (presently use of pesticide is minimal in the State) ii. Use of technology to improve quality and productivity. iii. Value addition, post harvest management, packaging and storage, enhancement of shelf life during marketing period. iv. Possibility of export to SAARC, West Asian and Middle East countries.	i. Likely increase in competition from the foreign producers even in domestic market due to WTO norms. ii. Inter-hilly state competition. iii. Change in government policies (central / state) regarding import duty, subsidy / support price due to globalization.

Source: Directorate of Agriculture, Himachal Pradesh, Shimla.

TABLE 2: SWOT ANALYSIS OF HORTICULTURE SECTOR IN HIMACHAL PRADESH

Strengths	Weaknesses
i. Diverse agro-climatic conditions. Production of almost all kinds of horticultural crops. ii. Production of sub tropical fruits, and off-season fruit crops (for plains) with a delay in fruit maturity by about 45 days. iii. Vast domestic market. Nearness of the wholesale market at Delhi, export of quality product outside the State.	i. Lack of irrigation facilities, water resources, small & scattered land holdings. ii. Poor quality planting material (seeds and root stock), lack of training for pruning and good management of the orchards. iii. Unpredictable weather, frost, hail storm, drought.

TABLE 2: SWOT ANALYSIS OF HORTICULTURE SECTOR IN HIMACHAL PRADESH-*Contd.*

Strengths	Weaknesses
iv. Well developed institutional framework for research, extension, processing, marketing and communication.	iv. Lack of scope for mechanization to save labor cost, gaps in application of technology to increase production and quality due to hostile climate, difficult terrain, poor communication. v. High cost of marketing due to transportation. No organized system of cooperatives and marketing intelligence for farmers. vi. Low per capita holding, high pressure on land use for cereal, fodder crops, etc. vii. Poor domestic market, dependence on distant markets. viii. Post-harvest losses, perishable nature of fruits. ix. Lack of reliable database, media support for horticulture industry.
Opportunities	**Threats**
i. Diversification towards high value low volume crops, spices, off-season vegetables, niche-based crops, organic crops production. Presently use of pesticide is minimal in the state. ii. Export of fruits to West Asian countries, help from tourism industry. iii. Post-harvest management, increasing shelf life during marketing period and packaging.	i. Likely increase in competition from the foreign producers even in domestic market due to WTO norms fully effective since 2002. ii. Pressure on forest resources due to increased production of fruits. iii. Likely adverse effect due to changing environment / global warming.

Source: Directorate of Horticulture, NavBahar, Shimla.

TABLE 3: SWOT ANALYSIS OF ANIMAL HUSBANDRY IN HIMACHAL PRADESH

Strengths	Weaknesses
i. Large number of species of livestock. ii. Vast area of permanent pasture and grazing land for fodder. iii. Fairly well developed institutional framework for the development of animal husbandry research, extension, marketing and credit. iv. Good domestic demand for milk products, wool, eggs, etc.	i. Poor quality breed having low yield. ii. Lack of fodder, feed, limited cultivated fodder. iii. Inadequate veterinary facilities. iv. Inadequate facilities of processing livestock products. v. Serious gaps in application of modern technologies for increasing quality and yield.
Opportunities	**Threats**
i. Diversification of animal husbandry through rearing crossbreed animals (cattle, buffalo and sheep) for high yield. ii. Increase in the quality of the product. Although, milk production per capita is higher than the national average. iii. Increase awareness of nutritional value of milk to increase demand for the livestock processing industry.	i. Likely increase in competition from the foreign producers in livestock sector in domestic market due to WTO norms (2002). ii. Change in Government policies (central / state) regarding import duty, subsidy / support price for livestock due to globalization. iii. Pressure on forest and pasture due to increased livestock.

Source: Directorate of Animal Husbandry, Himachal Pradesh, Shimla.

3.2. Thrust areas in agriculture, horticulture and animal husbandry sector

The State of Himachal Pradesh has its own Planning Department but its planning thrust areas have been moving around the central plan. Agriculture has an important place in the economy of the state because 75 percent of its population is directly or indirectly dependent on agriculture. The major thrust areas of planning in various sectors of agriculture are given in table 4.

TABLE 4: THRUST AREAS IN AGRICULTURE SECTOR DURING DIFFERENT PLAN PERIODS IN HIMACHAL PRADESH

S. No.	Five Year Plan	Thrust Areas
1.	Ist Plan 1951-56	To increase food grain production using improved agriculture practices.
2.	IInd Plan 1956-61	Emphasis on food grain production and raising cash crops to increase income.
3.	IIIrd Plan 1961-66	Training to village labour workers, artisans, farmers and strengthen agriculture information system.
4.	IVth Plan 1969-74	Emphasis on HYV seeds, fertilizers, insecticides / pesticides, farm machinery and credit facilities.
5.	Vth Plan 1974-78	Self sufficiency in food grains, enhancing cash crops like potato, ginger and vegetable seeds.
6.	VIth Plan 1980-85	Increasing crop yield, cultivation of off-season vegetables with sound water-harvesting techniques.
7.	VIIth Plan 1985-90	Increasing crop yield, cultivation of off-season vegetables with sound water-harvesting techniques.
8.	VIIIth Plan 1992-97	Expansion of irrigation, remuneration prices to farmers, diversification of agriculture.
9.	IXth Plan 1997-2002	Diversification towards high income generating crops, insurance cover for commercial crops.
10.	Xth Plan 2002-2007	Enhancing productivity and quality of crops, emphasis on increased area under irrigation.
11.	XIth Plan 2007-2012	Technology transfer for increasing productivity, timely supply of HYV inputs, integrated nutrient management (INM) and integrated pest management (IPM) and increased irrigation.
12.	XIIth Plan 2012-2017	Technology transfer for increasing productivity, timely supply of HYV inputs, INM, IPM and increased irrigation, crop insurance introduced.

Source: Planning Department, Govt. of Himachal Pradesh, and Directorate of Agriculture, Himachal Pradesh, Shimla.

TABLE 5: THRUST AREAS IN HORTICULTURE SECTOR DURING DIFFERENT PLAN PERIODS IN HIMACHAL PRADESH

S.No.	Five Year Plan	Thrust Areas
1.	Ist Plan 1951-56	Development of horticulture, emphasis on fruit plant research.
2.	IInd Plan 1956-61	Research programmes for temperate and sub-tropical region, for dry fruits and on control of insects and pests.
3.	IIIrd Plan 1961-66	Training programmes for gardeners, beekeeping, orchard cultivation and intensified fruit research.
4.	IVth Plan 1969-74	Increased supply and use of fertilizers, insecticides / pesticides and farm machinery, credit facility through banks.
5.	Vth Plan 1974-78	Strong research programmes, development of marketing infrastructure.

TABLE 5: THRUST AREAS IN HORTICULTURE SECTOR DURING DIFFERENT PLAN PERIODS IN HIMACHAL PRADESH- *Contd.*

S.No.	Five Year Plan	Thrust Areas
6.	VIth Plan 1980-85	Strong research programmes, development of marketing infrastructure.
7.	VIIth Plan 1985-90	Strong research programmes, development of marketing infrastructure.
8.	VIIIth Plan 1992-97	Strong research programmes, development of marketing infrastructure.
9.	IXth Plan 1997-2002	Diversification through new fruit varieties and other ancillary enterprises.
10.	Xth Plan 2002-2007	Improving productivity and quality of fruits, intensification / diversification of horticulture in less developed areas, post-harvest management facilities.
11.	XIth Plan 2007-2012	Improving productivity and quality of fruits, intensification / diversification of horticulture in less developed areas, post-harvest management facilities.
12.	XIIth Plan 2012-2017	Improving productivity and quality of fruits, intensification / diversification of horticulture in less developed areas, post-harvest management facilities.

Source: Planning Department, Govt. of Himachal Pradesh, and Directorate of Horticulture, NavBahar, Shimla.

TABLE 6: THRUST AREAS IN ANIMAL HUSBANDRY DURING DIFFERENT PLAN PERIODS IN HIMACHAL PRADESH

S. No.	Five Year Plan	Thrust Areas
1.	Ist Plan 1951-56	Improvement through scientific breeding, expansion of curative and preventive measures of disease control.
2.	IInd Plan 1956-61	Cross breeding of cattle and Red Sindhi and Dexter and buffaloes with Murrah.
3.	IIIrd Plan 1961-66	Training to veterinary staff, milk supply scheme, sheep and wool development programmes.
4.	IVth Plan 1969-74	Training to veterinary staff, milk supply scheme, sheep and wool development programmes.
5.	Vth Plan 1974-78	More stress on cross breeding, focus on making this sector an economic proposition.
6.	VIth Plan 1980-85	Setting up small dairy units in milk shed areas, organized collection facility, establishment of chilling plants.
7.	VIIth Plan 1985-90	Setting up small dairy units in milk shed areas, organized collection facility, establishment of chilling plants.
8.	VIIIth Plan 1992-97	Setting up small dairy units in milk shed areas, organized collection facility, establishment of chilling plants.
9.	IXth Plan 1997-2002	Setting up small dairy units in milk shed areas, organized collection facility, establishment of chilling plants.
10.	Xth Plan 2002-2007	Setting up small dairy units in milk shed areas, organized collection facility, establishment of chilling plants. Milch cattle insurance scheme introduced.
11.	XIth Plan 2007-2012	Setting up small dairy units in milk shed areas, organized collection facility, establishment of chilling plants. Milch cattle insurance scheme continued.
12.	XIIth Plan 2012-2017	Setting up small dairy units in milk shed areas, organized collection facility, establishment of chilling plants. Milch cattle insurance scheme continued. Improvement of veterinary services, super germplasm breeding, increased poultry for BPL and tribal areas.

Source: Planning Department, Govt. of Himachal Pradesh, and Directorate of Animal Husbandry, Himachal Pradesh, Shimla.

3.3. Constraints and areas of intervention in Himachal Pradesh

Various constraints and areas of intervention in different sectors in the state of Himachal Pradesh are described as follows:

3.3.1. Agriculture sector

i. **Major constraints:** Farmers of Himachal Pradesh hold tiny and terraced holdings. Lack of irrigation, low consumption of fertilizers and lack of good road infrastructure are major constraints.

ii. **Intervention made by the government:** In respect of consolidation of holdings, contour cultivation and support for construction of retaining walls. Modern irrigation systems like sprinkler, drip-irrigation system through technical and financial support, increased availability and subsidy on fertilizers and construction of rural roads and ropeways.

iii. **Target groups:** Marginal and small farmers and inaccessible villages.

iv. **Future targets:** Checking soil erosion and increase in production and productivity, cultivation of cash crops and easy and cheap transportation for inputs and outputs.

3.3.2. Horticulture sector

i. **Major constraints:** Problems faced in production and post harvest handling, marketing and processing.

ii. **Intervention made by the Government:** Providing good quality root stock, popularizing high density plantation, extension and training services for proper management of orchards and integrated pest management.

iii. **Target groups:** All orchardists.

iv. **Future targets:** Production of good quality fruits and increase in income, reduction in post-harvest losses, good quality produce to consumer and increase in producer's share in consumer rupee.

3.3.3. Livestock sector

i. **Major Constraints:** Poor breed of animals, lack of fodder and feed, poor yield, lack of veterinary services, lack of marketing and processing for livestock output.

ii. **Intervention made by the Government:** Implementation of crossbreed programme, upgradation of non-descript animals and graded breed, proper management of natural resources, controlled grazing and tree lopping, increase in knowhow and providing inputs for cultivation of fodder crop and encouraging use of chaff cutter. Cover all animals under vaccination and increase the veterinary facilities, encourage private veterinary services and organize cooperative societies in villages for disposal of output.

iii. **Target groups:** All rural households having livestock (farmers and non-farmers).

iv. **Future targets:** Reduction of less productive animals through better cross breeding to increase income, increase of quantity and quality of fodder mainly green fodder, market oriented livestock enterprise.

3.4. Outlay earmarked for agriculture, horticulture and animal husbandry sector during different plan periods

The outlay in agriculture, horticulture and animal husbandry sectors for Himachal Pradesh during different plan periods is presented in table 7.

The table 7 reveals that in order to make green revolution period a movement, the outlay in the fourth plan period was enhanced to 3.5 times that of the third plan. Subsequently, the allocation for the agriculture sector is found to increase, almost continuously, about 1.5 to 3 times, IVth plan saw an enhancement of over 5 times. Similar was the trend observed in horticulture sector after IVth plan, with the exception of VIth and XIIth plan period. However, for animal husbandry, a decrease of allocation is noted during VIIth plan and XIth plan period.

4. Conclusion and Suggestions

(i) In order to have a better development through

TABLE 7: TOTAL OUTLAY IN AGRICULTURE DURING DIFFERENT PLAN PERIODS

(₹ in Lakh)

Plan	Period	Total outlay	Outlays in agriculture sector							
			Agri-culture	Percentage share	Animal husbandry	Percentage share	Horticulture	Percentage share	Total (4+6+8)	Percentage share
Ist	1951-56	527.25	36.5	6.92	9.03	1.71	-	-	45.53	8.64
IInd	1956-61	1602.6	70.41	4.39	33.25	2.07	-	-	103.66	6.47
IIIrd	1961-66	3384.47	170	5.02	70	2.07	-	-	240.00	7.09
IVth	1969-74	11342.97	822.25	7.25	175	1.54	278.75	2.46	1276.00	11.25
Vth	1974-78	15148.48	1100	7.26	650	4.29	776.00	5.12	2526.00	16.67
VIth	1980-85	65566	2139	3.26	1261.28	1.92	870.00	1.33	4270.28	6.51
VIIth	1985-90	132475.75	4958	3.74	1114.82	0.84	2761.00	2.08	8833.82	6.67
VIIIth	1992-97	348040	6155	1.77	4713.57	1.35	6150.00	1.77	17018.57	4.89
IXth	1997-02	570000	15310	2.69	11438.97	2.01	13995.00	2.46	40743.97	7.15
Xth	2002-07	1030000	32619	3.17	19012.24	1.85	26600.15	2.58	78231.39	7.60
XIth	2007-12	1405657	75173	5.35	13321	0.95	43126.00	3.07	131620.00	9.36
XIIth	2012-17	2280000	144604	6.34	20923	0.92	46454.00	2.04	211981.00	9.30

Source: Planning Department, Govt. of Himachal Pradesh.

market based economy in agriculture, the government of Himachal Pradesh implemented various programs and schemes, providing technical know-how and input subsidies. The emphasis is placed on continuing the commercialization of agriculture which will have an impact on accelerated development in infrastructure and transport facilities alongwith marketing network.

(ii) The different agro-climatic conditions are prevailing in the State which has vast potential for the development of horticulture crops like fresh fruits, floriculture, mushroom, off-season vegetables, beekeeping and rabbit farming. The most important aspect is to make them disease free for which the farmers / villagers should be trained in advance. In horticulture, the emphasis is on encouraging high density dwarf variety plantation, post harvesting management, storage and processing facility.

(iii) In livestock, the major emphasis is on the better milk giving cattle through better breeding by keeping the livestock disease free and on marketing management.

Once the policy makers go for the market based economy and commercialization, a slew of suggestions are made for future policy and strategy for agricultural development.

(i) The policy makers should devise ways to increase the share of producers in consumer's price to about 60 to 70 percent, along with the total factor productivity (TFP) at about 6 percent which other countries have achieved.

(ii) The State should concentrate on agriculture sector with added emphasis on the development of off-season vegetables, cash crops and organic manure based farming.

(iii) The wastage of produce should be tackled effectively through efficient farming practices like the organized retail market, efficient food distribution system and better storage facility.

(iv) In horticulture sector, the concentration should be on forest-based plants like medicinal herbs and aromatic plants, cultivation of spices, dry fruits, flowers, conventional and unconventional fruits for diversified farming.

(v) In livestock sector, more useful programs like better breeding, feeding and disease control should be encouraged along with the improvement in pasture land.

(vi) One should be able to use the varying agro-climatic conditions very judiciously in agriculture and horticulture sectors in the interest of people of Himachal Pradesh.

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Growth and Instability in Area, Production and Yield of Pulses in Punjab

LOVEPREET SINGH* AND SURBHI BANSAL**

Abstract

Punjab is the highest contributor in the cultivation of wheat and paddy but it lags behind in cultivation of pulses. The production of pulses is declining and its variability has increased in the past four decades. The present study is an attempt to examine the pattern of growth and instability in area, production and productivity of pulses in Punjab. The time series data for the period 1985-86 to 2017-2018 regarding area, production and yield of pigeon peas, urad bean, peas, mung bean, chickpea, lentil as well as total pulses as a whole has been used to compute compound growth rates, coefficient of variation, Cuddy-Della Valle Index (CDI) and Coppock's Instability Index (CII) to attain the objectives of the study. The growth rate of area and production of total pulses showed a decline of 6.17 and 5.60 percent per annum, respectively, but showed positive significant change in productivity, i.e., 0.61 percent per annum for pulses during the study period. The declining growth rate of area and production may be due to dominant wheat and paddy monoculture, mechanized farming (which leads to more production of other profitable crops) and the risk associated with pulses in terms of yield and profitability also leads to replacement of area under pulses. Mung bean is the major grown crop in Punjab as it constituted about 71 percent of area and 68 percent of total pulses production during TE 2017-18. The results of instability shows that almost all the pulses observed more variation in the production and least in the productivity. It is suggested that there is a need to strengthen research and development (R&D) for improving productivity of pulses in state. More focus should be given to the summer crops like mung bean which emerged as a good source of income to the farmers.

Keywords: *Punjab, pulses, CDI, CII, growth, instability.*

1. Introduction

Pulses continued to be an integral component of sustainable crop-production system, due to their ability of biological nitrogen fixation, low water requirement and capacity to withstand abnormal weather conditions (Ahlawat, 2016). India accounts for the highest production of pulses in the world. Pulses are the cheapest source of proteins and Indians fulfill 20 to 30 percent of their protein requirement from pulses. The protein content of pulses is three times higher than that of cereals (Grover & Singh, 2012). Pulses, therefore, alleviate the problem of protein deficiency to some extent in our country where the majority of people are vegetarian. Punjab being a pioneer state in early adoption of green revolution technology played a pivotal role in making India self-sufficient in food grains production. The drastic change in cropping pattern during seventies in the state resulted in relegating pulses and coarse cereals to marginal and sub-marginal lands (Grover & Singh, 2015).

In Punjab, pulses used to be integral part of the cropping system in past with a minor contribution in India's pulses basket (Maharjan, 2017). During 1970-71, Punjab had 413.7 thousand ha area under various pulses which declined to 49 thousand ha in 2014-15 and further to 30 thousand ha in 2017-18. Similarly, the area under chickpea declined from 357.9 thousand ha in 1970-71 to only 1.7 thousand ha in 2017-18 (Anonymous, 2018). Intensive and highly mechanized farming techniques and dominant wheat and paddy monoculture after green revolution led to decline in pulses area despite of better technological advancement and proper irrigation facilities (Singh *et al.*,2007) and (Bera *et al.*,2011). Along with other physical and economic factors, pulses research and development activities received less attention by both international and private multinational

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corporations (Reddy, 2010). Lack of assured market, ineffective government procurement, unfavorable parity in prices and trade liberalization make pulses cultivation unremunerative and less attractive compared to other crops (Joshi *et al.*, 2002; Chand, 2002). Thus, it is important to understand the behavior of different type of pulses grown in Punjab to attend the issue of increasing production in the country.

In order to increase the pulses production and to make pulses remunerative among farmers, Government of India has initiated various pulses development programs in different time periods, such as National Pulses Development Programme (1985), Special Food Grain production Program (1988), Technology Mission on Oilseed and Pulses (1991), Integrated Scheme on Oilseeds, Pulses, Oil palm and Maize (2004) and recently, National Food Security Mission-Pulses. The main objectives of all the programs launched by government were to restore the cropping pattern of pulses and to attain self-sufficiency in the production of pulses in India by distribution of certified improved quality seeds, demonstrations on improved technology, subsidies on sprayers and mini-kits, etc.

1.1. Objectives of the study

The present study has been undertaken with the following objectives:

i. To evaluate the overall trend in area, production and productivity of pigeon peas, urad bean, peas, mung bean, chickpea, lentil and total Pulses.

ii. To estimate growth rates and instability of pulses crops during the period 1985-86 to 2017-18 in Punjab.

2. Methodology

The present study is based on the data pertaining to the area (in hectare), production (in tones), productivity (in kg/ha) of various pulses (pigeon peas, urad bean, peas, mung bean, chickpea, lentils and total Pulses) for a period of 33 years (1985-86 to 2017-2018). Data was collected from the publications of Indian Institute of Pulses Research (IIPR) and *www.indiastat.com* to elicit the trends and instability in area, production and yield of pulses in Punjab.

2.1. Tools used for analysis

Trend analysis in the area, production and productivity of pulses was studied using compound annual growth rate (CAGR). The CAGR was computed by using the exponential function as given below.

$$Y = AB^t$$

Taking log on both sides

$$\log Y = \log A + t \log B$$

Where, Y = area, production, productivity of oilseeds in the year 't',

A = constant, B = regression coefficient,
t = time in years starting from base year 1970-71.

To test the significance of growth rates, correlation coefficients were estimated by using the following formula:

$$r = \{\text{Cov.}(Yt.)/\sqrt{\text{Var}(t).\text{Var}(Y)}\}$$

Where, r = correlation coefficient,

Y= area/production/yield, and t = time.

The agricultural instability can be measured by different methods, such as the coefficient of variation (CV), dispersion, CDI, CII, etc. The present study applies all these three methods for measuring the instability. CDI, firstly, de-trends the given series and gives a clear direction about the instability. The use of coefficient of variation as a measure to show the instability in any time series data has some limitation. If the time series data exhibit any trend, the variation measured by CV can be over-estimated, *i.e.*, the region which has growing production at constant rate will score high in instability of production if CV is applied for measuring instability. As against that, CDI attempts to de-trend the CV by using coefficient of determination (R^2). Thus, it is a better measure to capture instability in agricultural production. A low value of this index indicates the low instability in farm production and vice-versa. Instability was also analyzed using Coppock's index which is calculated as the antilog of the square root of the logarithmic variance (Coppock, 1962).

2.2. Cuddy-Della Valle Index (CDI)

CDI was originally developed by Cuddy and Valle

(1978) for measuring the instability in time series data that is characterized by trend. The estimable equation is as follows:

$$CDI = CV\sqrt{1 - \bar{R}^2}$$

Where, CV = Coefficient of variation (in percent),

R^2= Coefficient of determination from a time trend regression adjusted by the number of degrees of freedom.

2.3. Coppocks Instability Index (CII)

CII is a close approximation of the average year-to-year percentage variation adjusted for trend (Kaur & Singhal, 1988). The estimable equation is as follows:

$$\text{Coppock Index} = (\text{Antilog}\sqrt{\text{Vlog}} - 1) * 100$$

$$\text{Vlog} = \frac{1}{N-1}\sum(\log X_{t+1} - \log X_t - M)^2$$

$$M = \frac{1}{N-1}\sum(\log X_{t+1} - \log X_t)$$

Where, X_t = Area/production/Yield in the year 't',

N= Number of years,

M = Arithmetic mean of the difference between the logs of X_{t+1} , X_t , etc.,

log V = Logarithmic variance of the series.

3. Results and Discussion

3.1. Growth and trend in area, production and productivity of pulses in Punjab

The growth rate of pulses has been estimated for the period 1985-86 to 2017-18. The major highlights of the change in the area, production and productivity of pulses in Punjab have been presented in Figure 1 and Table 1. It can readily be seen that in the case of total pulses both the area and production has shown a negative and significant growth rate of 6.17 percent and 5.60 percent per annum, respectively, but showed positive significant change in productivity, *i.e.*, 0.61 percent per annum from 775.1 kg/ha in TE 1987-88 to 909.3 kg/ha in TE 2017-18. The declining growth rate of production in total pulses may be due to decline in area under pulses, dominant wheat and paddy monoculture, subsidies for irrigation, intensive and highly mechanized farming which also facilitate more production of other profitable crops in the state. Further, since pulses are risky in terms of yield and thereby profitability (Grover & Singh, 2015), labour intensive and more adaptive in dry areas the area under pulses has further replaced. While, the productivity of total pluses was increased, this may be due to various initiatives taken by the Government of India like National Food Security Mission, 2007-08.

Figure 1: Area, Production and Productivity of Total Pulses in Punjab, 1985-86 to 2017-18

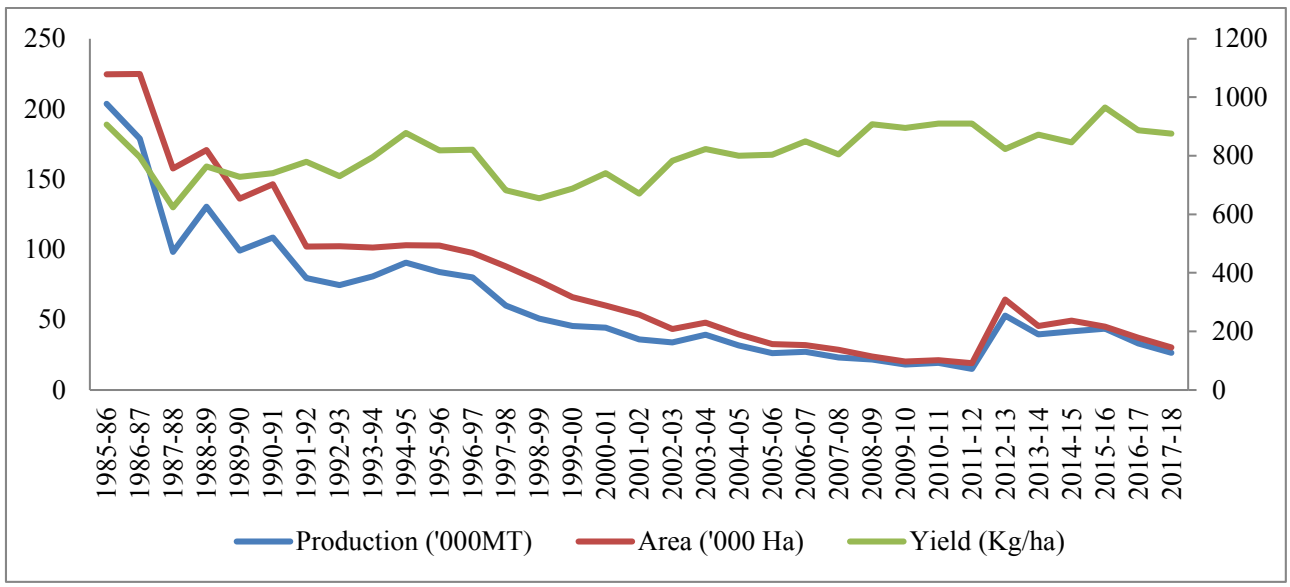

TABLE 1: CAGR OF AREA, PRODUCTION AND PRODUCTIVITY OF PULSES IN PUNJAB, 1985-86 TO 2017-18

Pulses	Area,'000 ha				Production, '000 MT				Productivity, kg/ha			
	TE 1987-88	TE 1997-98	TE 2007-08	TE 2017-18	TE 1987-88	TE 1997-98	TE 2007-08	TE 2017-18	TE 1987-88	TE 1997-98	TE 2007-08	TE 2017-18
Pigeon pea	33.1	11.1	7.0	3.6	33.0	9.2	6.3	3.4	984.9	829.6	905.1	963.3
	(-6.75***)				(-6.60***)				(0.16)			
Urad bean	11.2	5.9	3.2	1.9	6.3	2.3	1.4	1.0	557.6	390.5	448.6	551.3
	(-5.25***)				(-4.72***)				(0.56*)			
Peas	4.3	5.9	3.4	3.2	4.4	5.4	3.9	3.9	1056.2	918.1	1169.2	1200.0
	(-2.51***)				(-1.15)				(1.40***)			
Moth bean	0.7	0.7	0.1	0.0	0.4	0.5	0.1	0.0	333.3	705.6	667.7	0.0
	(-1.41)				(0.44)				(-16.81***)			
Mung bean	44.4	50.7	12.1	26.6	38.0	39.5	9.7	23.5	846.0	776.8	797.6	876.3
	(-3.84***)				(-3.48***)				(0.38)			
Chickpea	93.0	16.2	3.5	1.8	69.8	14.3	3.2	2.1	713.1	878.9	916.7	1283.3
	(-12.56***)				(-10.99***)				(1.93***)			
Lentil	11.5	5.6	1.8	1.5	7.7	3.5	0.8	1.0	667.3	629.1	460.3	410.7
	(-8.37***)				(-8.42***)				(-0.27)			
Total pulses	202.4	96.1	31.0	37.5	160.3	74.7	25.4	34.3	775.1	773.7	819.1	909.3
	(-6.17***)				(-5.60***)				(0.61***)			

Source: Calculated by researcher from secondary data **(**Indiastat.com**).**
NOTE: Figures in parenthesis indicate CAGR in percentage for the period 1985-86 to 2017-18.
* *and* *** indicate significance level at 10 percent and 1 percent, respectively.

Crop-wise analysis showed that area and production under all the pulses decreased from TE 1987-88 to TE 2017-18. The highest negative significant growth rate was associated with chickpea in area and production at the rate of 12.56 percent and 10.99 percent per annum, respectively. It was due to increased price variability, more erratic rainfall patterns and fluctuations in supply of modern inputs like pesticides and also due to adoption of improved varieties with same genetic base across state, which increases biotic and abiotic stresses (Reddy & Mishra, 2006). The peas and mung bean acreage in Punjab decreased at the rate -2.51 percent and -3.84 percent per annum, respectively, which is lowest among all pulses crops due to development of short duration varieties of mung bean which are cultivated as catch crop between wheat and paddy. Almost 71 percent of area and 68 percent of production of total pulses in Punjab was constituted by mung bean during TE 2017-18 which clearly depicted that mung bean was the major grown crop among all pulses in Punjab. In case of yield, positive and high significant growth rate was recorded in case of chickpeas (1.9%) and peas (1.4%) and positive significant in case of urad bean (0.56%). Whereas, mung bean and pigeon pea recorded positive and non-significant growth rate in yield. The development of new varieties and technologies in pulses led to increase in productivity across the state.

3.2. Instability in area, production and productivity of pulses

The results of instability analysis in area, production and productivity of pulses are furnished in table 2 using three measures of instability, such as CV, CDI and CII.

3.2.1. Analysis based on CV

The results of CV depicted that in case of total pulses in Punjab, 71.4 percent variation was observed in area, 72.65 percent in production and 10.49 percent in yield during the study period. Crop wise analysis showed that in case of area under pulses, the instability was observed more in chickpea (143.1%), followed by pigeon pea (81.1%) and lentil (78.2%). The least variation was observed in urad bean, mung bean and peas. Similar trend was observed in case of production of pulses. While, the variability in the productivity of pulses was observed more in chickpea, lentil and peas, whereas lower in mung bean and pigeon pea.

3.2.2. Analysis based on CDI

CDI computed for the given period as presented in Table 2 confirming the fact that 40.57 percent variation was observed in production, 35.8 percent in area and 8.31 percent in yield of total pulses. Values of instability in case of CDI shown lesser variation because CV is the simplest measure of instability and it over estimates the level of instability in time-series data which are characterized by long-term trends, but the CDI method de-trend the value and provide better results. Crop wise results shows that highest instability in area was observed in case of mung bean (42.8%) and peas (35.6%) while lowest in case of urad bean, *i.e.,* 17 percent. In case of production, the variation was observed higher in mung bean, followed by chickpeas. The variation in productivity was observed low as compared to that in area and production. It might be due to effective implementation of various programme by government, such as distribution of certified improved seeds, demonstration on improved technology, subsidies on sprayers and mini-kits in order to encourage the productivity of pulses.

3.2.3. Analysis based on CII

The CII is another measure of instability which provides close approximation of the average year to year percent variation. The estimation of variation in total pulses shows that more variation was observed in production as compared to area and yield. In case of area, variability was recorded more in case of peas (52.55%) followed by mung bean (50.78%) and lentil (36.43%). Similarly, instability in production was estimated more in case of peas, mung bean and lentil as compared to other pulses crops. But the variation in productivity was observed higher in case of peas, *i.e.,* 40.71 percent and least in case of mung bean (16.55%).

Thus, the instability analysis in term of area, production and yield of pigeon peas, urad bean, peas, mung bean, chickpea, lentils as well as total pulses in Punjab was computed with the help of three methods, *i.e.,* CV, CDI and CII. The results of three methods showed more variation in production and least in yield in case of all pulses crop as well as in total pulses. Here, more instability in production might due to continuous decline in the area under pulses, risky nature both in terms of production as well as profitability and increasing area under other profitable crops. Moreover, the yield of pulses was slightly increasing throughout the study period which led to less variation. On comparing the above discussed three methods, it is found that CII provided the more efficient results because it uses year to year variation and the current year area, production and yield of pulses was compared with previous year.

TABLE 2: MEASURES OF INSTABILITY IN AREA, PRODUCTION, AND PRODUCTIVITY OF PULSES IN PUNJAB, 1985-86 TO 2017-18

Pulses	Measures of instability	Area, '000 ha	Production, '000 MT	Productivity, kg/ha
Pigeon pea	Coefficient of Variation	81.1	89.12	11.65
	Cuddy-Della Valle Index	28.0	34.72	11.74
	Coppocks Instability Index	27.3	30.4	20.69
Urad bean	Coefficient of Variation	57.6	67.84	16.15
	Cuddy-Della Valle Index	17.0	30.30	15.51
	Coppocks Instability Index	23.4	22.33	17.82

TABLE 2: MEASURES OF INSTABILITY IN AREA, PRODUCTION, AND PRODUCTIVITY OF PULSES IN PUNJAB, 1985-86 TO 2017-18-*Contd.*

Pulses	Measures of instability	Area, '000 ha	Production, '000 MT	Productivity, kg/ha
Peas	Coefficient of Variation	41.6	39.38	20.25
	Cuddy-Della Valle Index	35.6	38.69	18.02
	Coppocks Instability Index	52.55	68.09	40.71
Mung bean	Coefficient of Variation	50.8	54.51	14.71
	Cuddy-Della Valle Index	42.8	47.93	14.56
	Coppocks Instability Index	50.78	56.67	16.55
Chick pea	Coefficient of Variation	143.1	142.19	22.64
	Cuddy-Della Valle Index	30.2	40.13	13.82
	Coppocks Instability Index	29.51	42.07	20.83
Lentil	Coefficient of Variation	78.2	82.98	23.90
	Cuddy-Della Valle Index	30.4	35.40	23.30
	Coppocks Instability Index	36.43	43.78	17.11
Total pulses	Coefficient of Variation	71.4	72.65	10.49
	Cuddy-Della Valle Index	35.8	40.57	8.31
	Coppocks Instability Index	29.9	34.1	9.98

Source: Calculated by Researcher from Secondary Data.

4. Conclusion and Suggestions

This study has analyzed the growth pattern and instability in the area, production and yield of pulses in Punjab by using CAGR, CV, CDI and CII for the period 1985-86 to 2017-18. The results revealed that there was 202.4 thousand ha area and 160.3 thousand MT production of total pulses during TE 1987-88 which went down to 37.5 thousand ha area and 34.3 thousand MT production during TE 2017-18 with a negative growth rate (-6.17 percent) in area and (-5.60 percent) in production. Whereas, productivity of total pulses was increasing at the rate of 0.61 percent per annum. The results of instability analysis revealed that all pulses, namely, pigeon peas, urad bean, peas, mung bean, chickpea, lentils as well as total pulses grown in state shown more variation in terms of production and least in term of productivity. In order to enhance the pulses production, government took various initiatives like distributing 4 kg kits to the farmers free-of-cost, training camps for farmers and demonstrate the use of the latest techniques for sowing pulses.

Based on the analysis it can be suggested that

i. There is a need to strengthen R&D for improving productivity of pulses in state.

ii. More focus should be given to the summer crops like mung dal which takes only 65 days in cultivation and emerged as third crop of the year as well as a good source of income to the farmers.

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Agro-Economic Research

Assessment of Livestock Feed and Fodder in the State of Uttar Pradesh*

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1. Introduction

In India where mixed farming system still prevails, livestocks reduce the risk through diversification of production and income sources and therefore, there is much greater ability of livestocks to represent liquid asset which can be realized at any time, adding further stability to the production system. The importance of livestocks as a source of income at the farm level varies across ecological zones and production systems, which in turn determines the breeds reared and the products and services generated. Livestocks rearing in India is practiced largely by small and unorganized farmers who generally rear one or two buffaloes or cows on crop residues and by-products with the help of underemployed and unemployed family labourers, particularly the women work-force. Livestock rearing has also assumed momentous dimensions in the context of decreasing operational land holding due to sub-division and fragmentation and ever increasing population, as the rural economy of our country is mainly characterized by subsistence agriculture and gross unemployment. Feed being the major item of cost for livestock rearing constitutes about 60 percent of the total cost of the milk production. Thus, for maximizing feed availability and minimizing the cost of feed will certainly increase the margin of profits to livestock rearers in the state of Uttar Pradesh. There is high pressure of livestock population on the available feed and fodder due to acute shortage of land for feed and fodder production. Therefore, a comprehensive assessment of the status of livestock development in the backward regions of Uttar Pradesh was barely needed to be done. Keeping this in view, the study entitled, "Assessment of Livestock Feed and Fodder in the State of Uttar Pradesh", was conducted with following main objectives.

1.1. Objective of the study

i. To estimate the area, production and productivity of major green and dry fodder crops.

ii. To study the growth pattern of major livestock production.

iii. To assess feed and fodder availability, requirement, deficit/surplus to improve productivity.

2. Methodology of Study

The proportionate sampling technique was applied to undertake sample livestock rearers from the distinct selected districts, one each from the western, eastern and central agro-economic regions of the state of Uttar Pradesh. These districts were chosen based on the size of the population of buffalo, cattle and goats by ranking the individual districts. Therefore, districts having top three ranks were selected representing different regions of the state of Uttar Pradesh. Such districts were, namely, (1) Agra from western region, (2) Baharaich from eastern region and (3) Lakhimpur Khiri from central region. From these districts, thus, 120 cattle rearing farmers, 120 buffalo rearing farmers and 120 goat rearing farmers were chosen making a total of 360 sample farmers from the state. Villages were selected based on the density of animal population. Cattle rearing farmers include both cross bred and indigenous cows. Farmers rearing all kinds of animals were considered more than one sample farmer. The sampling design is given in Table.

3. Major Findings of the Study

The main findings of the present study are as follows:

i. The population of crossbred female cattle in the state of Uttar Pradesh was dominant, wherein, the maximum were in milk production.

ii. Obviously the majority of adult female buffaloes was in the milk production and the number of female buffaloes under the age of one to three years as well as up to one year was considerable in the whole state

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NOTE: Detailed report is available on the website of respective Agro-Economic Research Centre

TABLE 1: SAMPLING DESIGN

State	Regions	Districts	Sample farmers			
			Cattle rearers	Buffalo rearers	Goat/ sheep rearers	Total
Uttar Pradesh	Western	Agra	18	29	31	78
	Eastern	Baharaich	46	47	46	139
	Central	Lakhimpur Khiri	56	44	43	143
		Total	120	120	120	360

iii. The population of both female as well as male goats under the age of one year was maximum in the state. The numbers of female goats in milk production were also considerable in the state of Uttar Pradesh.

iv. Regarding the growth pattern of livestock, the growth in population of exotic cows was tremendous, by 3 times more till the 20th census in the state.

v. Among the buffaloes, the number of female buffaloes had increased considerably in the state as a whole.

vi. As regards the availability of green fodder, there was a deficit of total green fodder by 681.50 lakh metric tonnes till 19th census in the state of Uttar Pradesh.

vii. The educational level among the sample respondents was deplorably poor as 41.70 percent of them were illiterates in the present era of cyber age.

viii. Regarding gender of respondents, the majority, i.e., 90.64 percent were males and only 9.31 percent were females among the total sample respondents.

ix. Regarding average experiences in respective occupations of farmers, it was generally found that crop-grower had 27 years, livestock rearer had 17 years and a goat rearer had 11 years' experience in the area under study.

x. The average income per household from different occupations was estimated as ₹ 1,45,143 from agriculture, ₹ 1,03,149 from dairying, ₹ 13,640 from goat rearing and from other occupations, it was ₹ 98,826 per household in the area under study.

xi. Regarding average family member engaged in different occupations, it was generally found that in farming (growing crops) had 1.44 members, 1.92 members in dairying and in goat rearing only 1.26 members were engaged in the area under the study.

xii. Accordingly, primary occupation among the total 247 sample households, 134 had adopted agriculture, 22 adopted animal husbandry and dairying, 62 adopted agricultural labour, 22 adopted non-farm labour, none opted trade, one opted private employment, and one opted other job.

xiii. As their secondary occupation out of 247 households, 23 had opted agriculture, 122 opted animal husbandry and dairying, 56 opted agricultural labour, 27 non-farm labor, none opted trade, 4 opted private employment and 5 opted other job in the area under study.

xiv. The average land owned was estimated as 2.04 acres per farmer in the area under study.

xv. The area under fodder crops was estimated as 0.33 acre per farm among sample animal rears.

xvi. Regarding sources of irrigation it was found that the maximum, *i.e.,* 153 sample farmers had used bore wells and 22 had used canals as source of irrigations in the area under the

study.

xvii. The main kharif crops were paddy, sugarcane, bajra and maize while rabi crops were wheat and barseem in the area under study.

xviii. The per acre return from paddy was ₹ 35,328, ₹ 1,54,507 from sugarcane, ₹ 16,386 from bajra, ₹ 12,456 from maize, ₹ 9,824 from fodder, ₹ 42,136 from wheat and ₹ 5,709 from berseem, respectively.

xix. Age-group wise classification of buffaloes showed that up to 1 year there were only 4, in 1 to 2 years there were 35 and in the age-group of above two years there were 198 buffaloes on an overall.

xx. The age-wise classification of crossbred cattle indicated that up to 1 year the number was nil, in 1-2 years, the number was 15 and in above 2 years group, the number was 165 on an overall.

xxi. The age-wise classification of indigenous cattles showed that up to 1 year the number was nil, in 1-2 years group, the number was only 3 and above 2 years group, the number was 28 on an overall.

xxii. The age-wise of classification of goats showed that in up to 1 year group there were 53, in 1-2 years group there were 234 and in above 2 years group there were 242 on an overall.

xxiii. The value of milking buffaloes was comparatively much higher than the milking bovine animals of other categories in the area under study.

xxiv. Among pregnant heifers, the value of heifers of crossbred cattle was higher. But among the non-pregnant heifers the value of buffalo heifers was higher.

xxv. As regards the feed and fodder, fed to buffaloes, it was found that the milking buffaloes were fed comparatively larger quantity of feed and fodder than that to the dry buffaloes in the area under study.

xxvi. Thus, milking animals and pregnant heifers were fed larger quantity of feeds and fodders than that to other animals in the area under study.

xxvii. The total requirement of green fodder during 2019 was higher for the milking buffaloes followed by cattles. But for adult male cattles and buffaloes, the requirement of green fodder was lower. For goats it was considerable.

xxviii. The requirement of dry fodder for buffaloes in milk production, young stock of buffalo and cattle in milk production was found to be higher. But for goats and adult male cattles and buffaloes, it was lower in the state.

xxix. The total requirement of concentrates was found to be higher for the milking buffaloes. But for goats, it was found to be lowest in the state.

xxx. Crop residues were received maximum from wheat and paddy crops and the minimum from other cereals and small millets. It was also received considerably from other fodder crops.

xxxi. Regarding availability of grains, it was received maximum from paddy and wheat and the minimum from small millets and other cereals in state as a whole.

xxxii. Grazing land, feed preservation and storage as well as legumes grown as hedge were the major sources of livestock feed in the area under the study.

xxxiii. Maximum of cattle sheds mentioned by sample households were kaccha cattle sheds and the average value of such cattle sheds was slightly higher than that of pucca cattle sheds in the state of U.P.

xxxiv. As regards labour and other charges, it was found that buffaloes and crossbred cattles, both males and females, required comparatively more human labour than other livestocks in the area under study in U.P.

xxxv. About returns from livestock rearing,

the return from milk by buffaloes was ₹ 10,92,469 against the minimum, *i.e.*, ₹ 1,86,115 from goats.

xxxvi. The return from dung was higher in case of buffaloes against the minimum in case of goats in the area under study.

xxxvii. Almost all the sample livestock rearers had expressed their views that due to the lack of land they could not put required area of land under fodder seed as well as crop production in the state of U.P.

xxxviii. Also, all the livestock rearers had complained about unsuitability of land for fodder cultivation, high cost of cultivation/ production, low prices and returns and quality seed in the markets.

xxxix. Also, majority of sample livestock rearers had complained about lack of grazing land, livestock extension services, awareness of government programs and training facilities in the state of U.P.

xl. 100 percent of sample livestock rearers had reported that they had not adopted any post-harvest techniques of fodder preservation, etc., in the state of U.P.

xli. Almost all the sample livestock rearers had reported that stored/preserved fodders were found much inferior than to have fresh fodders in the area under the study.

xlii. Also, majority of sample livestock rearers had told fodder production to be much expensive and more laborious and acute shortage of post-harvest management of fodders.

xliii. Regarding benefits from the government almost all the sample livestock rearers had reported not geting any benefit from government for livestock rearing in the area under study in the state U.P.

xliv. Majority of livestock rearers had suggested the concerned state and union government to supply adequate and proper fodder seeds and vulnerable market facilities for the improvement of fodder related crops in the state of U.P. They also suggested for providing effective extension services and training facilities.

4. Policy Suggestions

Based on the main findings of this study the following suggestions are being prescribed for policy implications:

i. For improving the quality of milk, the tremendous growth of exotic cattle population in the state of U.P. should be checked and shifted to increase the population of improved breeds of buffaloes as well as indigenous cattles.

ii. The huge deficit of total green fodders in the state of U.P. must be fulfilled through more intensification in fodder cultivation throughout the year in all the seasons.

iii. Educational level of livestock rearers must be upgraded as this occupation has been opted by the poorer where in about 42% are still illiterates in the present cyber age.

iv. Female members of livestock rearing households must be encouraged for opting this occupation independently throughout the state like the women dairy cooperatives of Gujarat state, for increasing females share and gainful employment.

v. Since dairying has emerged as second higher income providing occupation among majority of landless and marginal farmers, there must be any sound policy by government so that it may be opted as their primary occupation.

vi. Due to small holdings the farmers must be encouraged to shift to animal husbandry and dairying from crops raising.

vii. The farmers rearing animals must be facilitated and be provided subsidy to grow more fodder crops for improving quality of milk.

viii. Source of irrigation must be increased with improved avenues in the area under study.

ix. During rabi season, more fodder crops must be grown and during zaid season too suitable

varieties of fodders must be grown in the state of U.P.

x. The numbers of improved breeds of buffaloes must be increased curtailing the number of crossbred cattles.

xi. The number of goats up to age of 1 year must be increased as it was less.

xii. For improving the quality of milk, the pregnant heifers, milking cattles and buffaloes must be cared properly during feeding, watering, etc., in winter and summer seasons in the state of U.P.

xiii. For increasing the milk yields of buffaloes as well as indigenous cattles in the state of U.P., the quantity of green fodders, concentrates, etc., and supplements must be increased undoubtedly.

xiv. For higher returns, remunerative prices of both mahishvanshiya as well as govanshiya animals must be paid to the respective livestock rearers based on the fat percentage in their milk produced.

xv. Suitable post-harvest techniques must be provided to needy livestock rearers, particularly to those who consider preserved/stored fodders and feeds inferior than fresh fodders and feeds in the area under study.

xvi. Government must provide incentives/ benefits to potential livestock rearers for sustainable and vulnerable processing and marketing facilities in the state of U.P.

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**Complete references can be seen in the detailed report available at the website of respective AERC.

Commodity Reviews

Foodgrains

Procurement of Rice

The total procurement of rice during kharif marketing season 2019-20 up to 31.08.2020 is 51.01 million tonnes as against 43.96 million tonnes during the corresponding period of last year. The details are given in Table 1. A comparative analysis of procurement of rice for the period of marketing season 2019-20 (up to 31.08.2020) and the corresponding period of last year is given in figure 1. The percentage share of different states in procurement of rice has been given in figure 2.

TABLE 1: PROCUREMENT OF RICE

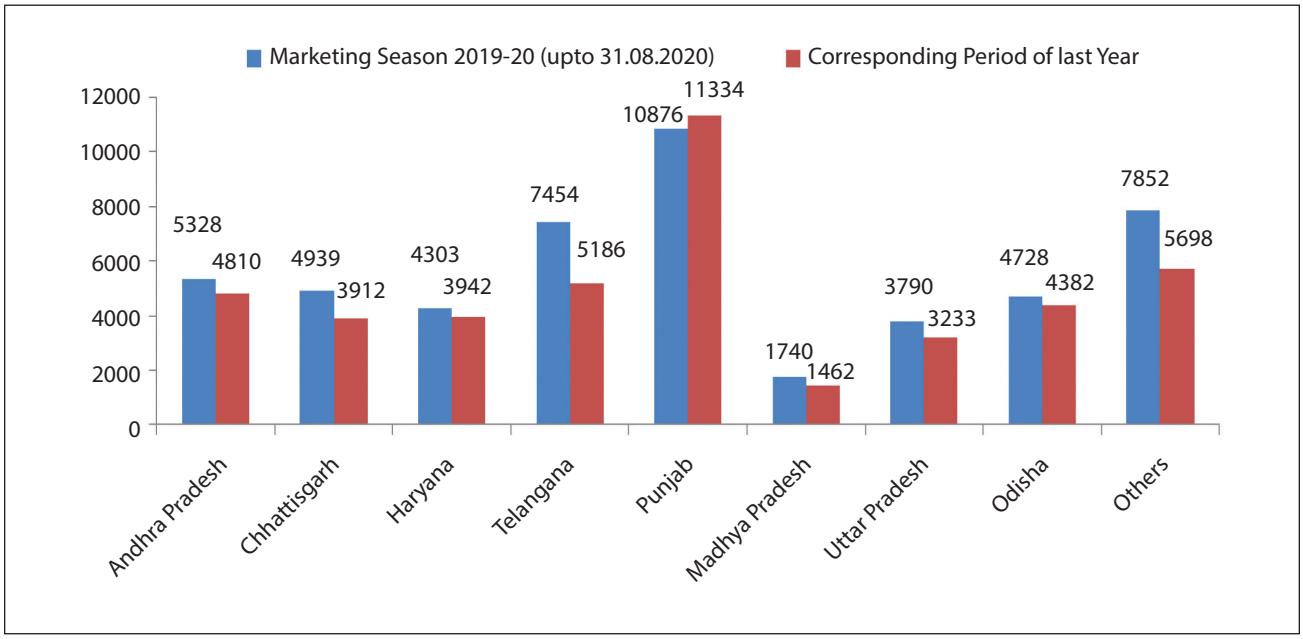
(In thousand tonnes)

State	Marketing Season 2019-20 (upto 31.08.2020)		Corresponding Period of last Year 2018-19	
	Procurement	Percentage to Total	Procurement	Percentage to Total
1	2	3	4	5
Andhra Pradesh	5328	10.4	4810	10.9
Chhattisgarh	4939	9.7	3912	8.9
Haryana	4303	8.4	3942	9.0
Telangana	7454	14.6	5186	11.8
Punjab	10876	21.3	11334	25.8
Madhya Pradesh	1740	3.4	1462	3.3
Uttar Pradesh	3790	7.4	3233	7.4
Odisha	4728	9.3	4382	10.0
Others	7852	15.4	5698	13.0
Total	51010	100.0	43959	100.0

Source: Department of Food & Public Distribution.

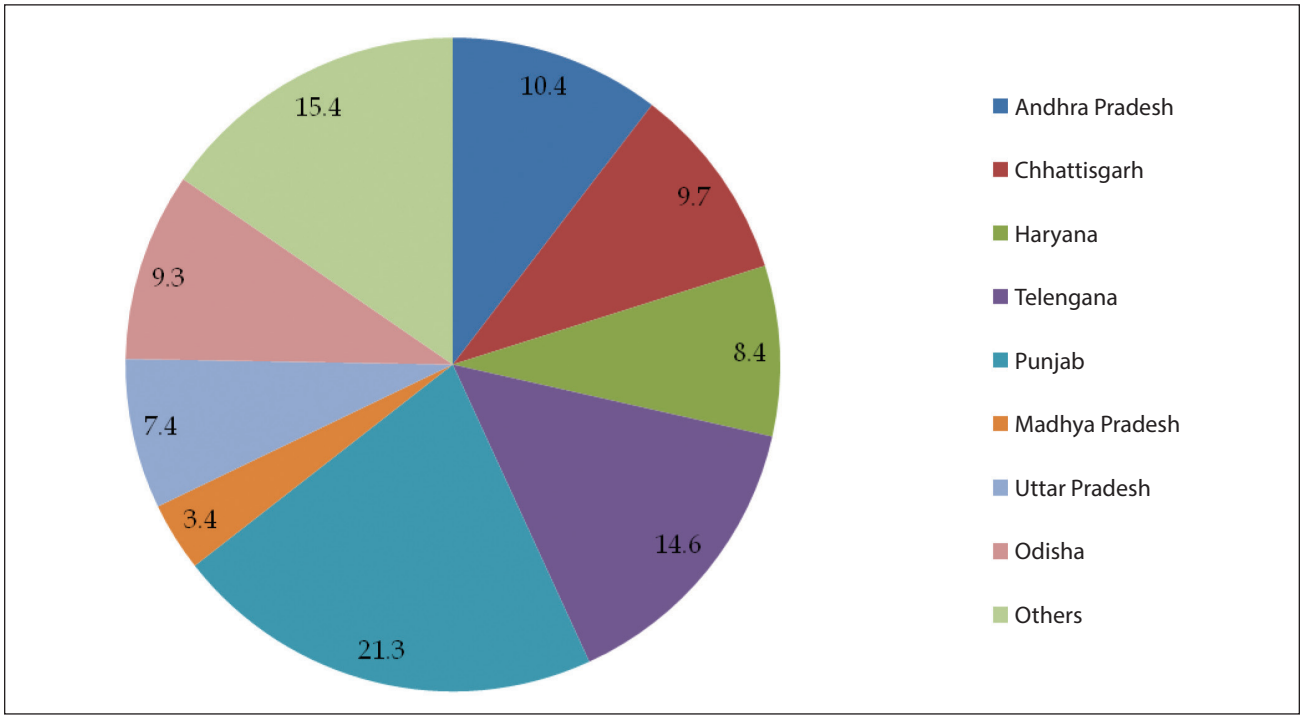
Figure 1: State-wise Procurement of Rice

(In thousand tonnes)



Source: Department of Food & Public Distribution.

Figure 2: Percentage Share of Different States in Procurement of Rice during Marketing Season 2019-20 (up to 31.08.2020).



Source: Department of Food & Public Distribution.

Procurement of Wheat

The total procurement of wheat during rabi marketing season 2020-21 up to 31.08.2020 is 38.98 million tonnes as against 34.79 million tonnes during the corresponding period of last year. The details are given in Table 2. The figure 3 depicts the comparison of procurement of wheat during the marketing season 2020-21 (up to 31.08.2020) with the corresponding period of last year. The percentage share of different states in procurement of wheat has been given in figure 4.

TABLE 2: PROCUREMENT OF WHEAT

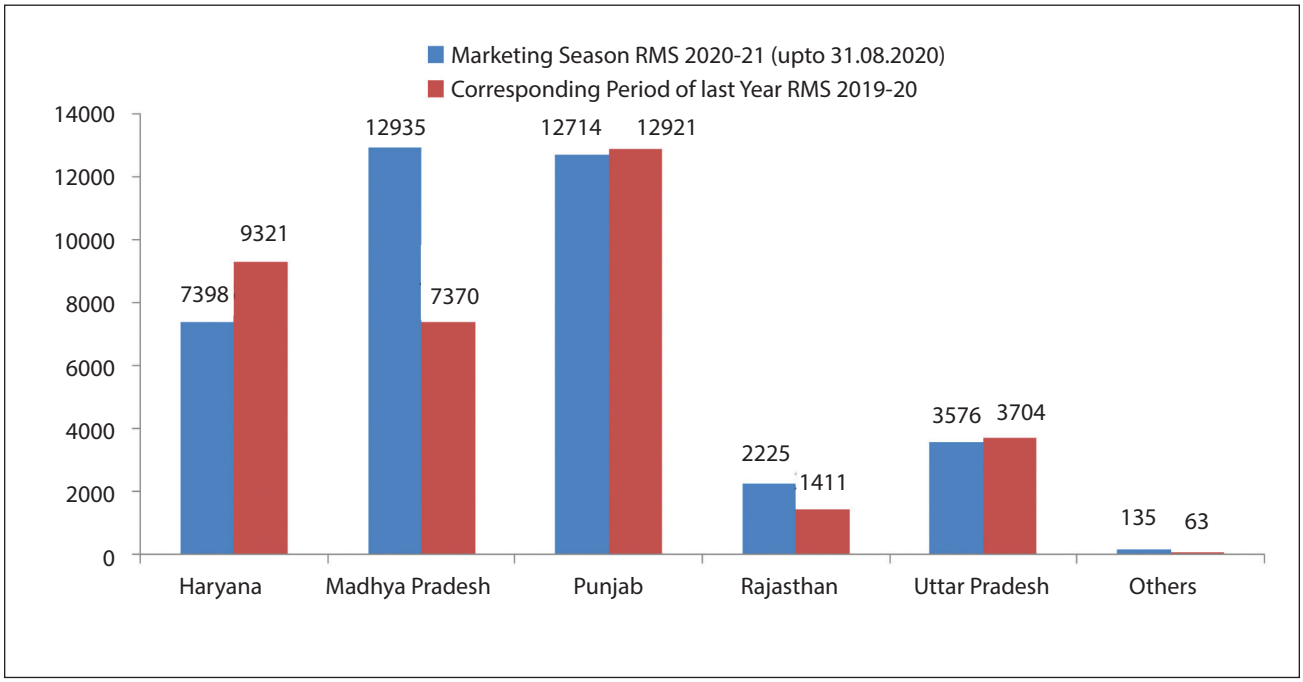
(In thousand tonnes)

State	Marketing Season RMS 2020-21 (upto31.08.2020)		Corresponding Period of last Year RMS 2019-20	
	Procurement	Percentage to Total	Procurement	Percentage to Total
1	**2**	**3**	**4**	**5**
Haryana	7398	19.0	9321	26.8
Madhya Pradesh	12935	33.2	7370	21.2
Punjab	12714	32.6	12921	37.1
Rajasthan	2225	5.7	1411	4.1
Uttar Pradesh	3576	9.2	3704	10.6
Others	135	0.3	63	0.2
Total	38983	100.0	34790	100.0

Source: Department of Food & Public Distribution.

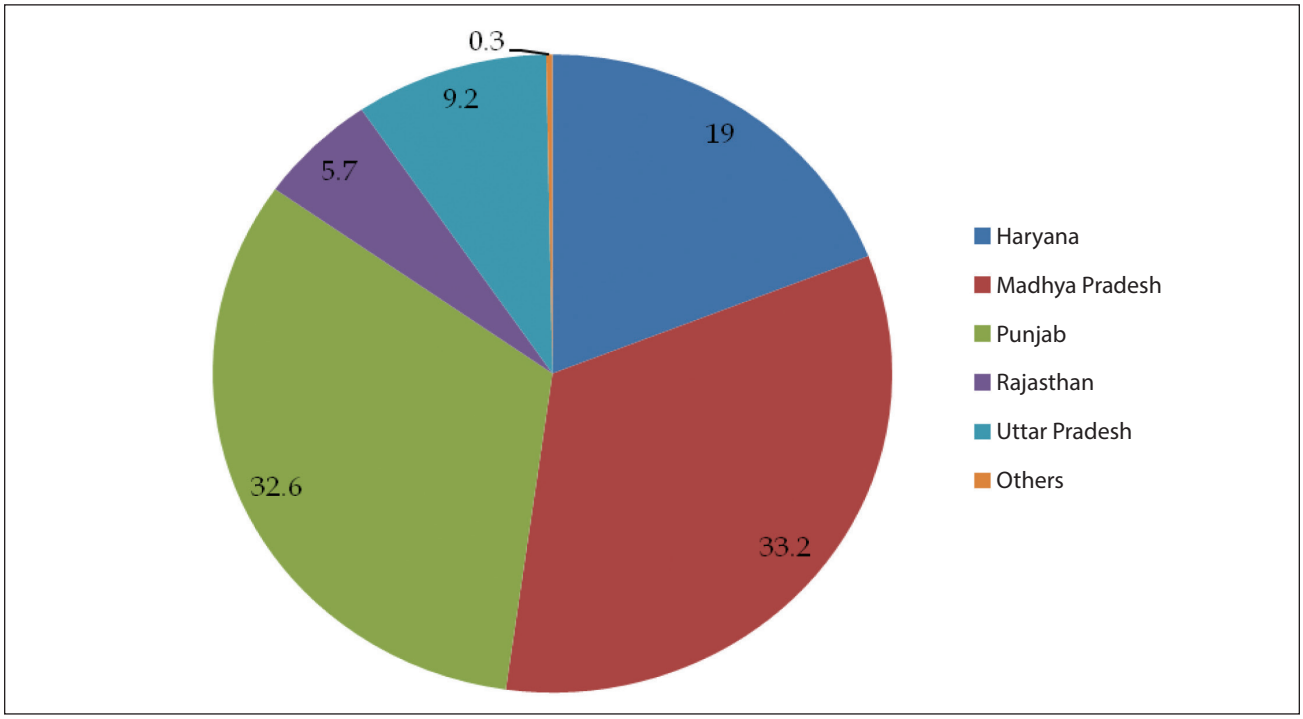
Figure 3: State-wise Procurement of Wheat

(In thousand tonnes)



Source: Department of Food & Public Distribution.

Figure 4: Percentage Share of Different States in Procurement of Wheat during Marketing Season 2020-21 (up to 31.08.2020)



Source: Department of Food & Public Distribution.

Commercial Crops

Oilseeds

The Wholesale Price Index (WPI) of nine major oilseeds as a group stood at 155.7 in August, 2020 showing an increase of 1.10 percent over the previous month and increased by 2.64 percent over the previous year.

The WPI of all individual oilseeds showed a mixed trend. The WPI of rape and mustard seed (3.04 percent), copra (1.89 percent), niger seed (23.21 percent), safflower (0.18 percent), sunflower (3.53 percent) and soyabean (1.62 percent) increased over the previous month. However, the WPI of groundnut seed (1.47 percent), cotton seed (0.06 percent), copra (0.21 percent) and gingelly seed (sesamum) (1.62 percent) decreased over the previous month.

Manufacture of Vegetable and Animal Oils and Fats

The WPI of vegetable and animal oils and fats as a group stood at 133.7 in August, 2020 which shows an increase of 2.77 percent over the previous month. Moreover, it also increased by 17.38 percent over the corresponding months of the previous year. The WPI of mustard oil (3.25 percent), soybean oil (2.12 percent), sunflower oil (1.42 percent), copra oil (0.89 percent) and cotton seed oil (2.62 percent) increased over the previous month. However, the WPI of groundnut oil (0.65 percent) and rapeseed oil (1.90 percent) decreased over the previous month.

Fruits & Vegetable

The WPI of fruits & vegetable as a group stood at 187.4 in August, 2020 showing a decrease of 3.08 percent over previous month and an increase of 4.05 percent over the corresponding month of the previous year.

Potato

The WPI of potato stood at 321.4 in August, 2020 showing an increase of 7.89 percent over the previous month. Moreover, it also increased by 82.93 percent over the corresponding months of the previous year.

Onion

The WPI of onion stood at 142.3 in August, 2020 showing an increase of 5.10 percent over the previous month and a decrease of 34.48 percent over the corresponding months of the previous year.

Condiments & Spices

The WPI of condiments & spices (group) stood at 143.8 in August, 2020 showing an increase of 0.56 percent over the previous month and an increase of 1.55 percent over the corresponding months of the previous year. The WPI of black pepper increased by 0.16 percent, turmeric increased by 1.94 percent, and that of chillies (dry) decreased by 7.35 percent.

Raw Cotton

The WPI of raw cotton stood at 107.2 in August, 2020 showing an increase of 0.75 percent over the previous month and a decrease of 11.18 percent over the corresponding months of the previous year.

Raw Jute

The WPI of raw jute stood at 213.9 in August, 2020 showing an increase of 2.64 percent over the previous month and an increase of 11.99 percent over the corresponding months of the previous year.

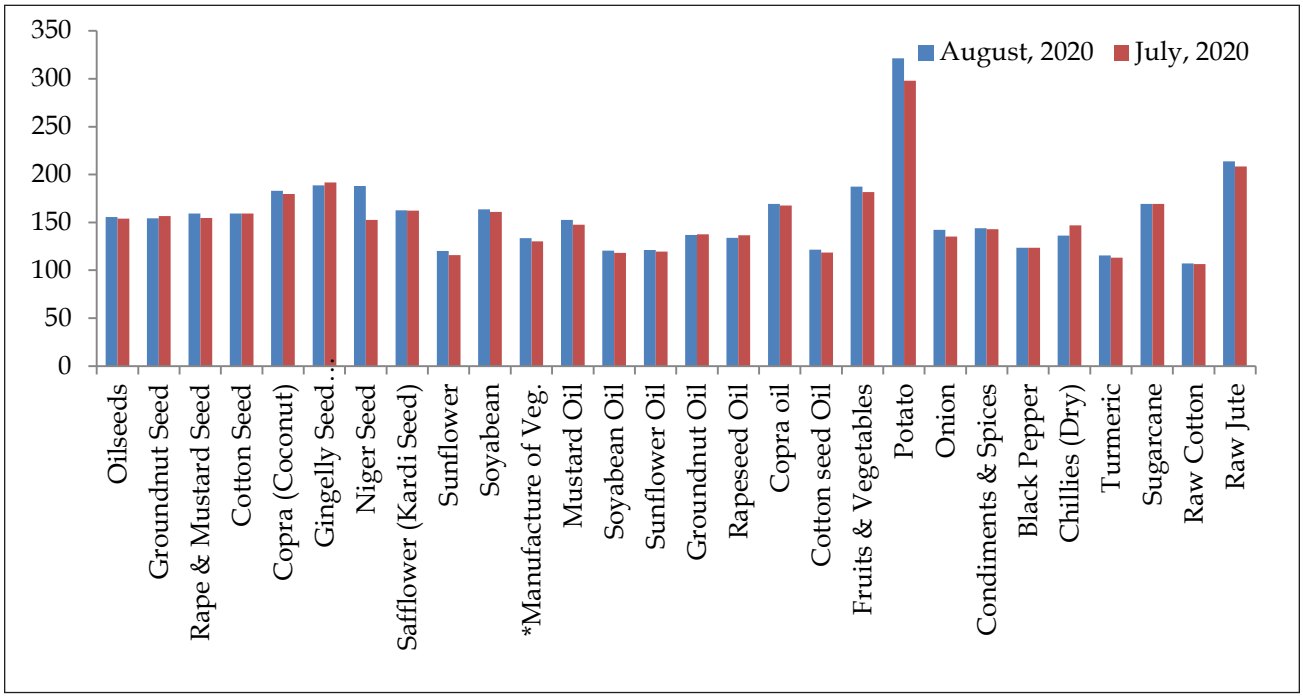
Wholesale Price Index of Commercial Crops is given in Table 3. A graphical comparison of WPI for the period of August, 2020 and July, 2020 is given in figure 5 and the comparison of WPI during the August, 2020 with the corresponding month of last year has been given in figure 6.

TABLE 3: WHOLESALE PRICE INDEX OF COMMERCIAL CROPS

(Base Year: 2011-12=100)

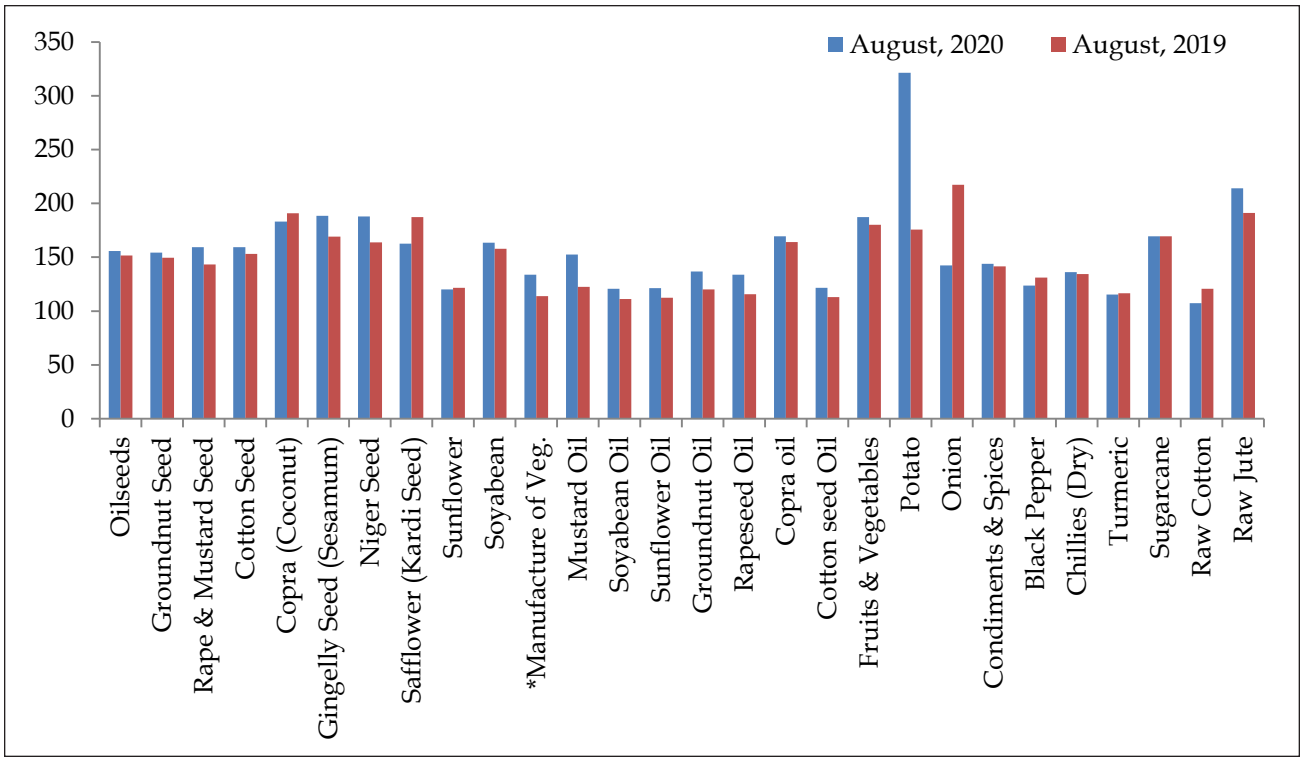
Commodity	Latest August, 2020	Month July, 2020	Year August, 2019	%age variation over the	
				Month	Year
Oilseeds	155.7	154	151.7	1.10	2.64
Groundnut Seed	154.2	156.5	149.6	-1.47	3.07
Rape & Mustard Seed	159.3	154.6	143.2	3.04	11.24
Cotton Seed	159.2	159.3	153	-0.06	4.05
Copra (Coconut)	183.1	179.7	190.8	1.89	-4.04
Gingelly Seed (Sesamum)	188.6	191.7	169	-1.62	11.60
Niger Seed	187.9	152.5	163.8	23.21	14.71
Safflower (Kardi Seed)	162.7	162.4	187.2	0.18	-13.09
Sunflower	120.1	116	121.5	3.53	-1.15
Soyabean	163.5	160.9	157.8	1.62	3.61
Manufacture of Vegetable and Animal Oils and Fats	133.7	130.1	113.9	2.77	17.38
Mustard Oil	152.5	147.7	122.6	3.25	24.39
Soyabean Oil	120.6	118.1	111.2	2.12	8.45
Sunflower Oil	121.3	119.6	112.4	1.42	7.92
Groundnut Oil	136.8	137.7	120	-0.65	14.00
Rapeseed Oil	133.9	136.5	115.6	-1.90	15.83
Copra oil	169.3	167.8	164	0.89	3.23
Cotton seed Oil	121.5	118.4	112.9	2.62	7.62
Fruits & Vegetables	187.4	181.8	180.1	3.08	4.05
Potato	321.4	297.9	175.7	7.89	82.93
Onion	142.3	135.4	217.2	5.10	-34.48
Condiments & Spices	143.8	143	141.6	0.56	1.55
Black Pepper	123.6	123.4	131.1	0.16	-5.72
Chillies (Dry)	136.2	147	134.4	-7.35	1.34
Turmeric	115.4	113.2	116.5	1.94	-0.94
Sugarcane	169.5	169.5	169.5	0.00	0.00
Raw Cotton	107.2	106.4	120.7	0.75	-11.18
Raw Jute	213.9	208.4	191	2.64	11.99

Figure 5: WPI of Commercial Crops during August, 2020 and July, 2020



*Manufacture of Vegetable, Animal Oils and Fats

Figure 6: WPI of Commercial Crops during August, 2020 and August, 2019



*Manufacture of Vegetable, Animal Oils and Fats

Statistical Tables

Wages

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

Month: July, 2020 (In ₹)

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	June, 20	8	454	325	600	400	400	NA	NA	NA	NA
	Guntur	Tadikonda	June, 20	8	350	NA	NA	NA	325	NA	NA	NA	NA
Telangana	Ranga Reddy	Arutala	June, 20	8	350	200	720	NA	NA	NA	NA	800	NA
Karnataka	Bangalore	Harisandra	Dec, 19	8	360	340	300	300	340	330	500	400	NA
	Tumkur	Gidlahali	Dec, 19	8	350	320	350	350	350	320	400	360	NA
Maharashtra	Bhandara	Adyal	May, 20	8	275	200	275	200	275	200	400	350	325
	Chandrapur	Ballarpur	May, 20	8	300	200	300	200	300	NA	350	300	200
Jharkhand	Ranchi	Gaitalsood	June, 19	8	239	239	239	239	239	239	330	330	NA

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

Month: August, 2020 (In ₹)

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	June, 20	8	454	325	600	400	400	NA	NA	NA	NA
	Guntur	Tadikonda	June, 20	8	350	NA	NA	NA	325	NA	NA	NA	NA
Telangana	Ranga Reddy	Arutala	July, 20	8	800	267	800	NA	NA	NA	NA	500	NA
Karnataka	Bangalore	Harisandra	Dec, 19	8	360	340	300	300	340	330	500	400	NA
	Tumkur	Gidlahali	Nov, 19	8	350	320	350	350	350	320	400	360	NA
Maharashtra	Bhandara	Adyal	June, 20	8	300	200	275	200	275	200	400	350	350
	Chandrapur	Kothari	June, 20	8	300	200	300	200	300	NA	350	300	200

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

Month: July, 2020 (In ₹)

State	District	Centre	Month & Year	Type of Labour	Normal Daily Working Hours	Ploughing	Sowing	Weeding	Harvesting	Other Agri Labour	Herdsman	Skilled Labours		
												Carpenter	Black Smith	Cobbler
Assam	Barpeta	Howly	May,19	M	8	300	NA	250	250	200	NA	275	280	NA
				W	8	NA	NA	170	170	150	NA	NA	NA	NA
Bihar	Muzaffarpur	Bhalui Rasul	June, 20	M	8	350	400	350	350	400	NA	500	500	NA
				W	8	250	300	250	250	300	NA	NA	NA	NA
	Nawada	Masahi	May, 20	M	8	200	200	200	250	250	NA	450	450	NA
				W	8	NA	200	200	250	250	NA	NA	NA	NA
Chhattisgarh	Dhamtari	Sihava	Feb,20	M	8	400	NA	NA	NA	180	160	320	300	200
				W	8	NA	NA	NA	NA	160	140	NA	150	NA
Gujarat*	Rajkot	Rajkot	March, 20	M	8	287	287	287	287	253	200	483	483	450
				W	8	NA	203	287	287	253	200	NA	NA	NA
	Dahod	Dahod	March, 20	M	8	300	300	150	150	150	NA	400	350	300
				W	8	NA	250	150	150	150	NA	NA	NA	NA
Haryana	Panipat	Ugarakheri	May, 20	M	8	400	400	400	400	400	NA	550	400	NA
				W	8	NA	300	300	350	300	NA	NA	NA	NA
Himachal Pradesh	Mandi	Mandi	Feb, 20	M	8	450	330	330	330	330	330	430	430	300
				W	8	NA	330	330	330	330	330	NA	NA	NA
Kerala	Kozhikode	Koduvally	Dec, 19	M	4-8	1240	850	NA	800	800	NA	950	NA	NA
				W	4-8	NA	NA	700	700	700	NA	NA	NA	NA
	Palakkad	Elappally	Dec,19	M	4-8	NA	600	NA	600	720	NA	750	NA	NA
				W	4-8	NA	NA	330	330	330	NA	NA	NA	NA

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

Month: July, 2020 (In ₹)

State	District	Centre	Month & Year	Type of Labour	Normal Daily Working Hours	Ploughing	Sowing	Weeding	Harvesting	Other Agri Labour	Herdsman	Skilled Labours		
												Carpenter	Black Smith	Cobbler
Madhya Pradesh	Hoshangabad	Sangarkhera	June, 20	M	8	250	NA	200	200	250	150	400	400	NA
				W	8	NA	NA	200	200	200	NA	NA	NA	NA
	Satna	Kotar	June, 20	M	8	300	300	300	300	300	300	500	500	500
				W	8	NA	300	300	300	300	300	NA	NA	NA
	Gwalior	Mohana	June, 20	M	8	300	250	250	300	250	250	500	500	500
				W	8	NA	200	200	250	200	200	NA	NA	NA
Odisha	Bhadrak	Chandbali	Jan, 20	M	8	450	400	400	400	425	300	500	400	350
				W	8	NA	300	300	300	317	250	NA	NA	NA
	Ganjam	Aska	Jan, 20	M	8	300	300	300	300	350	250	500	500	500
				W	8	NA	250	250	250	300	220	NA	NA	NA
Punjab	Monga	Nathoke	May, 20	M	8	500	500	NA	NA	500	NA	500	460	NA
				W	8	NA	400	NA	NA	400	NA	NA	NA	NA
Rajasthan	Barmer	Kuseep	May, 20	M	8	500	NA	NA	400	NA	500	700	500	NA
				W	8	NA	NA	NA	NA	NA	300	NA	300	NA
	Jalore	Sarnau	May, 20	M	8	400	400	300	NA	NA	NA	600	400	NA
				W	8	NA	300	250	NA	NA	NA	NA	300	NA
Tamil Nadu*	Thanjavur	Pulvarnatham	June, 20	M	8	NA	410	NA	NA	373	NA	NA	600	600
				W	8	NA	NA	182	176	689	NA	NA	NA	NA
	Tirunelveli	Malayakulam	June, 20	M	8	NA	450	NA	500	NA	NA	NA	NA	NA
				W	8	NA	200	205	213	NA	NA	NA	NA	NA
Tripura	State Average		Aug, 19	M	8	331	331	297	276	275	275	350	319	NA
				W	8	NA	331	250	229	225	241	NA	NA	NA

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

Month: July, 2020 (In ₹)

State	District	Centre	Month & Year	Type of Labour	Normal Daily Working Hours	Ploughing	Sowing	Weeding	Harvesting	Other Agri Labour	Herdsman	Skilled Labours		
												Carpenter	Black Smith	Cobbler
Uttar Pradesh*	Meerut	Ganeshpur	April, 20	M	8	300	300	300	300	300	NA	500	NA	NA
				W	8	NA	250	250	250	250	NA	NA	NA	NA
	Jhansi	Jhansi	April, 20	M	8	250	250	250	250	250	NA	416	NA	.NA
				W	8	NA	200	200	200	200	NA	NA	NA	NA
	Chandauli	Chandauli	April, 20	M	8	300	NA	NA	NA	300	NA	500	NA	NA
				W	8	NA	250	250	250	250	NA	NA	NA	NA

M - Man
W - Woman
NA - Not Available
NR – Not Reported
* The State reported district average daily wage

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

Month: August, 2020 (In ₹)

State	District	Centre	Month & Year	Type of Labour	Normal Daily Working Hours	Ploughing	Sowing	Weeding	Harvesting	Other Agri Labour	Herdsman	Skilled Labours		
												Carpenter	Black Smith	Cobbler
Assam	Barpeta	Howly	May,19	M	8	300	NA	250	250	200	NA	275	280	NA
				W	8	NA	NA	170	170	150	NA	NA	NA	NA
Bihar	Muzaffarpur	Narsinghpur	June, 20	M	8	350	400	350	350	400	NA	500	500	NA
				W	8	250	300	250	250	300	NA	NA	NA	NA
	Shekhpura	Kutaut	May, 20	M	8	200	200	200	250	250	NA	450	450	NA
				W	8	NA	200	200	250	250	NA	NA	NA	NA

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

Month: August, 2020 (In ₹)

State	District	Centre	Month & Year	Type of Labour	Normal Daily Working Hours	Ploughing	Sowing	Weeding	Harvesting	Other Agri Labour	Herdsman	Skilled Labours		
												Carpenter	Black Smith	Cobbler
Chhattisgarh	Dhamtari	Sihava	Feb,20	M	8	400	NA	NA	NA	180	160	320	300	200
				W	8	NA	NA	NA	NA	160	140	NA	150	NA
Gujarat*	Rajkot	Rajkot	April, 20	M	8	292	292	292	292	272	120	510	483	450
				W	8	NA	292	292	292	272	100	NA	NA	NA
	Dahod	Dahod	April , 20	M	8	300	300	150	150	150	NA	400	350	300
				W	8	NA	250	150	150	150	NA	NA	NA	NA
Haryana	Panipat	Ugarakheri	May, 20	M	8	400	400	400	400	400	NA	550	400	NA
				W	8	NA	300	300	350	300	NA	NA	NA	NA
Himachal Pradesh	Mandi	Mandi	Feb, 20	M	8	450	330	330	330	330	330	430	430	300
				W	8	NA	330	330	330	330	330	NA	NA	NA
Kerala	Kozhikode	Koduvally	Dec, 19	M	4-8	1240	850	NA	800	800	NA	950	NA	NA
				W	4-8	NA	NA	700	700	700	NA	NA	NA	NA
	Palakkad	Elappally	Dec,19	M	4-8	NA	600	NA	600	720	NA	750	NA	NA
				W	4-8	NA	NA	330	330	330	NA	NA	NA	NA
Madhya Pradesh	Hoshangabad	Sangarkhera	July, 20	M	8	250	NA	200	200	250	150	400	400	NA
				W	8	NA	NA	200	200	200	NA	NA	NA	NA
	Satna	Kotar	July, 20	M	8	300	300	300	300	300	300	500	500	500
				W	8	NA	300	300	300	300	300	NA	NA	NA
	Gwalior	Mohana	July, 20	M	8	300	250	250	300	250	250	500	500	500
				W	8	NA	200	200	250	200	200	NA	NA	NA
Odisha	Bhadrak	Chandbali	Feb, 20	M	8	450	400	400	400	400	400	500	400	350
				W	8	NA	300	350	300	300	300	NA	NA	NA
	Ganjam	Aska	Feb, 20	M	8	300	300	300	300	350	250	500	500	500
				W	8	NA	250	250	250	300	220	NA	NA	NA

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

Month: August, 2020 (In ₹)

State	District	Centre	Month & Year	Type of Labour	Normal Daily Working Hours	Ploughing	Sowing	Weeding	Harvesting	Other Agri Labour	Herdsman	Skilled Labours		
												Carpenter	Black Smith	Cobbler
Punjab	Monga	Nathoke	June, 20	M	8	500	500	500	500	500	NA	500	460	NA
				W	8	NA	400	400	400	400	NA	NA	NA	NA
Rajasthan	Barmer	Kuseep	June, 20	M	8	NA	NA	400	NA	NA	500	700	500	NA
				W	8	NA	NA	NA	NA	NA	300	NA	300	NA
	Jalore	Sarnau	June, 20	M	8	400	NA	300	300	NA	NA	600	400	NA
				W	8	NA	NA	250	300	NA	NA	NA	350	NA
Tamil Nadu*	Thanjavur	Pulvarnatham	July, 20	M	8	NA	371	NA	NA	400	NA	479	450	NA
				W	8	NA	NA	174	155	177	NA	NA	NA	NA
	Tirunelveli	Malayakulam	July, 20	M	8	NA	400	NA	NA	734	NA	NA	NA	NA
				W	8	NA	250	206	233	NA	NA	NA	NA	NA
Tripura	State Average		Aug, 19	M	8	331	331	297	276	275	275	350	319	NA
				W	8	NA	331	250	229	225	241	NA	NA	NA
Uttar Pradesh*	Meerut	Ganeshpur	May, 20	M	8	300	300	300	300	300	NA	500	NA	NA
				W	8	NA	250	250	250	250	NA	NA	NA	NA
	Jhansi	Jhansi	May, 20	M	8	250	250	250	NA	250	NA	420	NA	.NA
				W	8	NA	250	250	NA	250	NA	NA	NA	NA
	Chandauli	Chandauli	May, 20	M	8	300	NA	NA	NA	300	NA	500	NA	NA
				W	8	NA	250	250	250	250	NA	NA	NA	NA

M - Man
W - Woman
NA - Not Available
NR – Not Reported
* The State reported district average daily wage

Prices

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

Commodity	Variety	Unit	State	Centre	Aug-20	Jul-20	Aug-19
Wheat	PBW 343	Quintal	Punjab	Amritsar	1700	1940	2150
Wheat	Dara	Quintal	Uttar Pradesh	Chandausi	1800	1870	1920
Wheat	Lokvan	Quintal	Madhya Pradesh	Bhopal	1753	1897	2030
Jowar	-	Quintal	Maharashtra	Mumbai	3200	3500	3600
Gram	No III	Quintal	Madhya Pradesh	Sehore	4451	3800	3864
Maize	Yellow	Quintal	Uttar Pradesh	Kanpur	1550	1550	1975
Gram Split	-	Quintal	Bihar	Patna	6100	6080	5980
Gram Split	-	Quintal	Maharashtra	Mumbai	5500	5700	5800
Arhar Split	-	Quintal	Bihar	Patna	8650	8650	8120
Arhar Split	-	Quintal	Maharashtra	Mumbai	8600	8500	8000
Arhar Split	-	Quintal	NCT of Delhi	Delhi	8300	8150	7300
Arhar Split	Sort II	Quintal	Tamil Nadu	Chennai	9000	9000	7400
Gur	-	Quintal	Maharashtra	Mumbai	4400	4500	4500
Gur	Sort II	Quintal	Tamil Nadu	Coimbatore	4500	4500	4500
Gur	Balti	Quintal	Uttar Pradesh	Hapur	3200	3300	3150
Mustard Seed	Black (S)	Quintal	Uttar Pradesh	Kanpur	4600	4500	3800
Mustard Seed	Black	Quintal	West Bengal	Raniganj	NA	4700	4250
Mustard Seed	-	Quintal	West Bengal	Kolkata	5560	5200	4350
Linseed	Bada Dana	Quintal	Uttar Pradesh	Kanpur	5200	4900	4850
Linseed	Small	Quintal	Uttar Pradesh	Varanasi	4900	5100	4500
Cotton Seed	Mixed	Quintal	Tamil Nadu	Virudhunagar	1900	1900	2500
Cotton Seed	MCU 5	Quintal	Tamil Nadu	Coimbatore	3000	3000	2800
Castor Seed	-	Quintal	Telangana	Hyderabad	NT	NT	5100
Sesamum Seed	White	Quintal	Uttar Pradesh	Varanasi	9450	9800	10100
Copra	FAQ	Quintal	Kerala	Alleppey	11000	10250	10850
Groundnut	Pods	Quintal	Tamil Nadu	Coimbatore	7000	7000	6000
Groundnut	-	Quintal	Maharashtra	Mumbai	8500	8700	9000

2. WHOLESALE PRICES (IN ₹) OF CERTAIN AGRICULTURAL COMMODITIES AND ANIMAL HUSBANDRY PRODUCTS AT SELECTED CENTRES IN INDIA-*Contd.*

Commodity	Variety	Unit	State	Centre	Aug-20	Jul-20	Aug-19
Mustard Oil	-	15 Kg.	Uttar Pradesh	Kanpur	1470	1460	1355
Mustard Oil	Ordinary	15 Kg.	West Bengal	Kolkata	2025	2025	1325
Groundnut Oil	-	15 Kg.	Maharashtra	Mumbai	1890	1900	1620
Groundnut Oil	Ordinary	15 Kg.	Tamil Nadu	Chennai	2400	2250	1980
Linseed Oil	-	15 Kg.	Uttar Pradesh	Kanpur	1500	1460	1450
Castor Oil	-	15 Kg.	Telangana	Hyderabad	1620	NT	1785
Sesamum Oil	-	15 Kg.	NCT of Delhi	Delhi	1880	1880	1820
Sesamum Oil	Ordinary	15 Kg.	Tamil Nadu	Chennai	3400	3800	3100
Coconut Oil	-	15 Kg.	Kerala	Cochin	2340	2235	2250
Mustard Cake	-	Quintal	Uttar Pradesh	Kanpur	1960	2160	1870
Groundnut Cake	-	Quintal	Telangana	Hyderabad	NT	NT	3786
Cotton/Kapas	NH 44	Quintal	Andhra Pradesh	Nandyal	4750	4700	5800
Cotton/Kapas	LRA	Quintal	Tamil Nadu	Virudhunagar	4200	3800	4800
Jute Raw	TD 5	Quintal	West Bengal	Kolkata	5350	4750	4375
Jute Raw	W 5	Quintal	West Bengal	Kolkata	5600	4800	4400
Oranges	-	100 No	NCT of Delhi	Delhi	NA	458	667
Oranges	Big	100 No	Tamil Nadu	Chennai	1200	1000	900
Banana	-	100 No.	NCT of Delhi	Delhi	375	375	417
Banana	Medium	100 No.	Tamil Nadu	Kodaikkanal	500	500	700
Cashewnuts	Raw	Quintal	Maharashtra	Mumbai	75000	80000	70000
Almonds	-	Quintal	Maharashtra	Mumbai	56000	60000	63000
Walnuts	-	Quintal	Maharashtra	Mumbai	60000	64000	60000
Kishmish	-	Quintal	Maharashtra	Mumbai	18000	18000	20000
Peas Green	-	Quintal	Maharashtra	Mumbai	8000	6000	6000
Tomato	Ripe	Quintal	Uttar Pradesh	Kanpur	3500	3900	2360
Ladyfinger	-	Quintal	Tamil Nadu	Chennai	2500	1400	2000
Cauliflower	-	100 No.	Tamil Nadu	Chennai	1800	1500	3500
Potato	Red	Quintal	Bihar	Patna	2500	2400	1170

2. WHOLESALE PRICES (IN ₹) OF CERTAIN AGRICULTURAL COMMODITIES AND ANIMAL HUSBANDRY PRODUCTS AT SELECTED CENTRES IN INDIA-*Concld.*

Commodity	Variety	Unit	State	Centre	Aug-20	Jul-20	Aug-19
Potato	Desi	Quintal	West Bengal	Kolkata	2900	2350	1200
Potato	Sort I	Quintal	Tamil Nadu	Mettuppalayam	3810	4510	2747
Onion	Pole	Quintal	Maharashtra	Nashik	1350	550	2300
Turmeric	Nadan	Quintal	Kerala	Cochin	11000	NA	11000
Turmeric	Salam	Quintal	Tamil Nadu	Chennai	11500	12000	10500
Chillies	-	Quintal	Bihar	Patna	13500	13500	10080
Black Pepper	Nadan	Quintal	Kerala	Kozhikode	NT	NT	30000
Ginger	Dry	Quintal	Kerala	Cochin	29000	NT	26000
Cardamom	Major	Quintal	NCT of Delhi	Delhi	111000	125000	126000
Cardamom	Small	Quintal	West Bengal	Kolkata	220000	205000	300000
Milk	Buffalo	100 Liters	West Bengal	Kolkata	6500	6500	6200
Ghee Deshi	Deshi No 1	Quintal	NCT of Delhi	Delhi	10500	10500	80000
Ghee Deshi	-	Quintal	Maharashtra	Mumbai	42500	40000	42000
Ghee Deshi	Desi	Quintal	Uttar Pradesh	Kanpur	40450	40400	39500
Fish	Rohu	Quintal	NCT of Delhi	Delhi	16000	15500	16500
Fish	Pomphrets	Quintal	Tamil Nadu	Chennai	40000	32000	40000
Eggs	Madras	1000 No.	West Bengal	Kolkata	4726	4285	4071
Tea	-	Quintal	Bihar	Patna	22050	22100	21350
Tea	Atti Kunna	Quintal	Tamil Nadu	Coimbatore	NA	NT	39000
Coffee	Plant-A	Quintal	Tamil Nadu	Coimbatore	40000	40000	38200
Coffee	Rubusta	Quintal	Tamil Nadu	Coimbatore	29500	29500	26500
Tobacco	Kampila	Quintal	Uttar Pradesh	Farukhabad	9500	8500	8400
Tobacco	Raisa	Quintal	Uttar Pradesh	Farukhabad	5200	5200	4400
Tobacco	BidiTobacco	Quintal	West Bengal	Kolkata	13200	13000	13200
Rubber	-	Quintal	Kerala	Kottayam	11000	10800	12800
Arecanut	Pheton	Quintal	Tamil Nadu	Chennai	66000	65000	59000

Crop Production

SOWING AND HARVESTING OPERATIONS NORMALLY IN PROGRESS DURING THE MONTH OF NOVEMBER, 2020

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

(K)—Kharif (R)—Rabi

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N.T. — No Transactions.
N.S.—No Supply/No Stock.
R. — Revised.
M.C. — Market Closed.
N.R.—Not Reported.
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Kg. — Kilogram.
Q. — Quintal.
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