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## Indian agriculture sector: impacts from COVID-19

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Arti Yadav\*

Indian Council of Social Science Research (ICSSR),  
Department of Commerce,  
Aligarh Muslim University,  
Aligarh, India  
Email: artiyadavdse@gmail.com  
\*Corresponding author

Irfan Ahmad

Department of Commerce,  
Aligarh Muslim University,  
Aligarh, India  
Email: drirfaan65@gmail.com

**Abstract:** The livelihood of around 70% of the Indian rural population depends on the agriculture sector. In India, even the earnings of the non-agriculture sectors in terms of backward and forward linkage for agro-based businesses also get impacted by the production of agricultural products. However, issues like cereal-centric, regionally-biased, and resource-intensive production are still about the agriculture sector of India. The present study attempts to provide an insight into the present scenario of the Indian agriculture sector after providing a brief review of the agricultural literature. Through empirical analysis using multiple regression technique, it tries to find out the factors responsible for the growth of the Indian agriculture sector. The study also explores the potential impact of COVID-19 on the agriculture sector of India based on various secondary sources. The result shows that agriculture trade, level of rainfall, and infrastructure development is significantly and positively, while life expectancy and employment in agriculture are significantly and negatively impacting the agricultural contribution to the GDP of India.

**Keywords:** agriculture sector; economic growth; COVID-19; India.

**JEL code:** O40, Q10.

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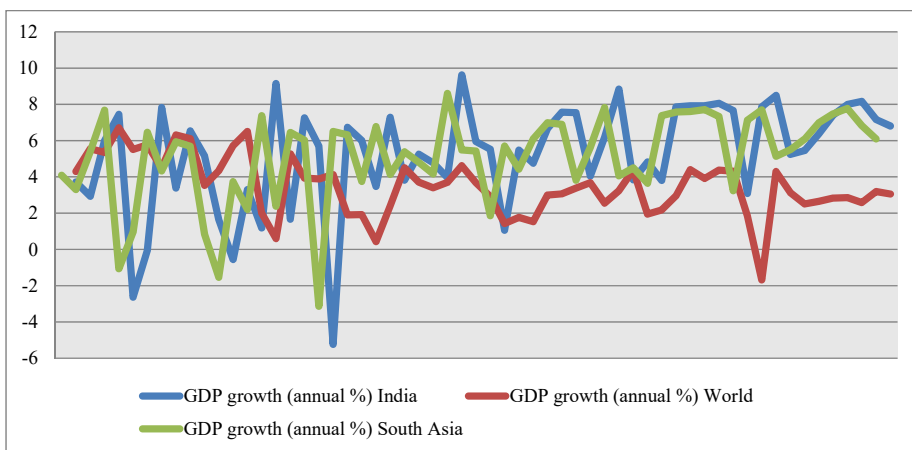
**Biographical notes:** Arti Yadav is currently a Post Doctoral Research Fellow at Indian Council of Social Science Research, India. She has also worked as an Assistant Professor at the Department of Commerce, Daulat Ram College, University of Delhi, India. She has a PhD in Commerce from the Department of Commerce, Aligarh Muslim University, India and holds a Master's degree from Delhi School of Economics, University of Delhi. She has also qualified UGC-NET/JRF. She has a number of research papers and chapters to her credit, published in well-known journals including Springer International Publishing, SAGE, France forum, IGI global and ADIBC listed journal.

Irfan Ahmad is currently an Associate Professor at the Department of Commerce, Aligarh Muslim University, India. He has a PhD in Commerce from the Department of Commerce, Aligarh Muslim University. He has an experience of teaching for more than ten years. Till date, he has supervised more than 30 candidates for their Master's and PhD levels. He has also worked as an Assistant Proctor in the university. He has a number of research papers and chapters to his credit, published in well-known journals and attended various national and international conferences.

## 1 Introduction

Among the world economies, the share of Asian economies is around 40% leading to a contribution of two-third in the total growth of gross domestic product (GDP). Nevertheless, it accounts for 50% of the agricultural production, and its two economies China and India have emerged as the leaders in global agricultural production (United Nations, 2020a). In terms of annual GDP growth, the contribution of India in all South Asian countries is highly significant (Figure 1). In India's GDP growth, presently (2018) the share of the service sector is highest (49%) followed by the Industry (27% around) and Agriculture (14%) (Figure 2). The share of agriculture has declined from 41% in 1960, while the share of services has increased from 38% to 49% in 2018 (World Bank Database, 2020d).

**Figure 1** GDP growth of India, South Asia and the World (1960–2018) (see online version for colours)

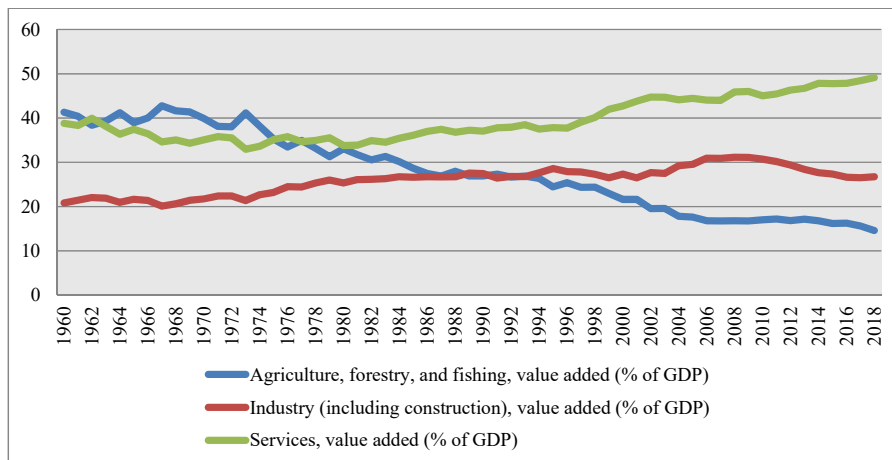


Source: World Bank Database (2020b)

In the World agricultural output, the share of India is 8% and it ranks second place. The agriculture sector in India is also the sector engaging a large number of workers that leads to the employment of around 55% of the total workforce. The livelihood of around 70% of the Indian rural population still depends on the agriculture sector. Earnings of the non-agriculture sectors in terms of backward and forward linkage for agro-based businesses are also affected by the production of agricultural products in India (Iqbal

et al., 2019). However, there are issues like cereal-centric, regionally biased, and resource-intensive production pertaining to the agriculture sector of India (FAO, 2020).

**Figure 2** Contribution of different sectors in Indian GDP (1960–2018) (see online version for colours)



*Source:* World Bank Database (2020c)

On the other hand, the ongoing critical situation in the form of the COVID-19 pandemic is also affecting countries around the world. It is already pushing the countries towards the global recession as most of the economic operations have been shut down to curb the spread of the virus (Jackson et.al., 2020). The economic growth of most of the economies had already been predicted in negative terms (Gopinath, 2020). According to the food and agricultural organisation (FAO, 2020) there will be chances of crisis for food at the world level. The Indian agriculture sector is no exception, as it is getting affected for reasons like low economic activities, negative impact on agricultural export and import, and fall in remittances. The present study attempts to provide a synopsis of the Indian agriculture sector after providing a brief review of the agricultural literature. In the next section, through empirical analysis, the study tries to find out the factors responsible for the economic growth of the Indian agriculture sector. The study further tries to explore the potential impact of COVID-19 on the agriculture sector of India.

## 2 Literature review

For all kinds of economies whether developed, developing, or underdeveloped, the agriculture sector is the primary source for the supply of food (Ashton and Pereira, 1973). The pressure of increasing population further raises the demand for food in underdeveloped or developing economies and if the increasing demand for food is not met, it will lead to an adverse effect on the growth rate of the economies (Macatta, 2016). The development of agricultural activities provides food security, as well as promotes and supports the growth of both rural and urban areas of an economy (Udemezu and Osegbue, 2018). After services, agriculture is the second-largest sector employing at the global level, accounting for around 28% (The World Bank, 2020). The agriculture sector

can also work as a growth engine for an economy if the growth of the produce becomes more than the consumption at the domestic level (Walkenhorst, 2006; Chakraborty and Garg, 2020).

The contribution of agricultural exports to economic growth in the least developed economies can't be ignored (Mohsen and Baghbanpour, 2016). The export promotion policies should be impartial for effective growth (Dawson, 2005). The significance of food staples for low-income countries provides more growth opportunities to many small farmers. Also, food staples have comparatively low weight attributes, making them much easier products for small farmers in the present scenario (Hazell and Braun, 2006; Meijerink and Roza, 2007). Moreover, by having a look at the past scenario, rates of poverty reduction have been very closely related to agricultural performance, indicating that the countries that have amplified their agricultural productivity the most, have also attained the reductions in poverty level (Byerlee et al., 2009). Accordingly, the development of agricultural technology is a core determinant of the capability to prolong enough food production with rising population and per-capita income in the world (Lanz et al., 2016).

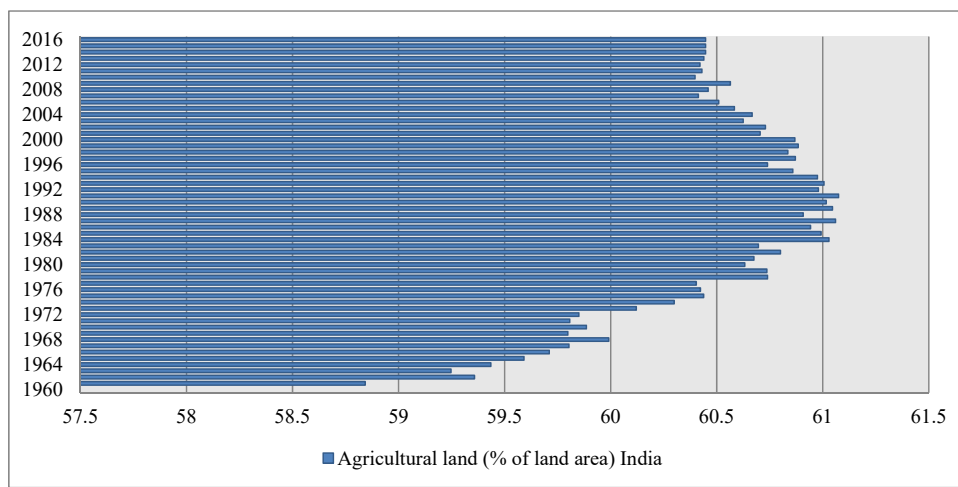
India's agricultural sector plays a very imperative role in economic development, even though its contribution has reduced over the years. India has made considerable enhancement in agricultural production through introducing high-yield seed varieties, better utilisation of fertilisers, and enhanced water management systems (Tripathi and Prasad, 2009). Further, reorganisation of land distribution, water management, and food distribution structure will augment productivity, and increased food requirement (Cagliarini and Rush, 2011). The change in Indian consumers' choices to higher-valued goods, such as horticultural and livestock products, makes the agricultural sector meet those demands which were predominantly in the Indian South and West regions (The World Bank, 2012). A probable concern for India has been the relatively poor farm performance of North India, as this region has intensified its specialisation in grain production to meet wheat and rice self-sufficiency, however, it has not achieved the expected growth rate over the previous three decades (Rada, 2013). There have been changes in Indian agriculture structure since independence, such as, agricultural workforce altered from cultivators to agricultural labours, uneconomic holdings have an escalating inclination as well as the number, shift to non-food crops from food crops, and area under food crops which was occupied by cereals has been changed mostly to non-cereals, growth trend of aggregate, sub-sector of agriculture excluding forestry is showing on the way out-trend since the inception of WTO (Arora, 2013). In addition to that, unsteadiness in an area became the foremost accountable factor for production volatility (Tripathi and Prasad, 2009). Therefore, the next section will try to contribute to the existing literature by discussing the current trends of the Indian agriculture sector in a comprehensive manner and further analyses the impact of selected variables on the growth of the agriculture sector in India.

### **3 Agriculture in India: emerging trends**

In the Indian economy, the significant drivers for the agricultural sector are its large population and increasing rural and urban income. In addition to its varied climate conditions across India and a large proportion of land is used for agriculture also encourages the cultivation of crops of different types (The World Bank, 2012).

Agriculture land as a percentage of total land area has increased in India in 2016 from what it was in 1961 (Figure 3). The landholding limit in India varies from state to state, though the ceiling ratio is 3:1 for dry land to perennially irrigated land in most of the states (Patnaik and Roy, 2019). In India, forest cover is around 65 million hectares of land, while around 195 million hectares of land is under cultivation, out of which 37% are irrigated and 63% are rain-fed (The World Bank, 2012).

**Figure 3** Agriculture land as percentage of total land area in India (1961–2016) (see online version for colours)



*Source:* World Bank Database (2020a)

About 54% of the employment in aggregate terms is in the agriculture sector of India (Table 1). The rate of participation has dropped since 1951; however, it is still significant in capturing unemployment. Even the share of the sector in the aggregate economy has declined over the period, it still holds an important space in the rural economy (around 70% of the total population of the country).

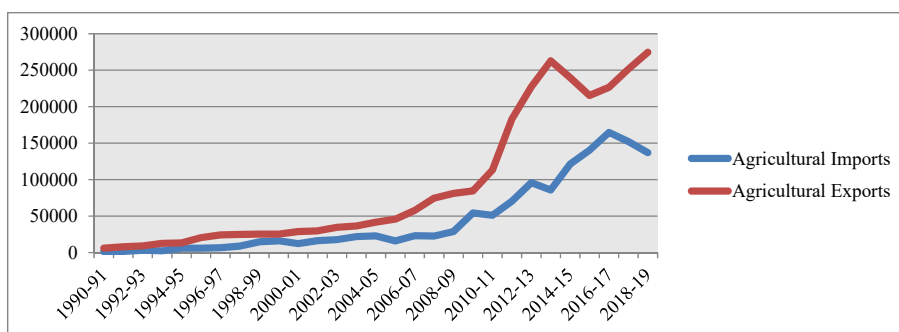
Globally, India is also called the powerhouse of agriculture as it is the largest producer of spices, milk, and pulses. In the production of wheat, rice, sugarcane, cotton, goat and sheep, tea, fruits, vegetables, and meat, India holds second place. The World's largest herd of cattle is also found in India (FAO, 2020). In the case of food grains like rice and wheat, West Bengal, Uttar Pradesh, Punjab, and Madhya Pradesh are the highest producer states in 2018–2019 (Table 2). While, Rajasthan, Karnataka, Madhya Pradesh, Uttar Pradesh, Bihar are the largest producers of Maize, Nutri Cereals, and Pulses in 2018–2019.

Further, growing external demand is motivating exports from the Indian agriculture sector. Figure 4 shows the growth of India's exports and imports of the principal agricultural commodities over the period from 1990–1991 to 2018–2019. The trend shows a significant increase in exports and imports. Globally, the country is among the top fifteen exporters of agricultural commodities. In the financial year 2019, India's agriculture exports arrived at US\$ 38.54 billion.

**Table 1** Agricultural workforce in India

Year	Agricultural workers				As a percentage of total		
	Total population (in million)	Average annual exponential growth rate (%)	Rural population as % to total population	Total workers (in million)	Total Agricultural workers (as a percentage of total workers)	Cultivators	Agricultural labourers
1951	361.1	1.25	82.7	139.5	69.7	71.9	28.1
1961	439.2	1.96	82	188.7	69.5	76	24
1971	548.2	2.2	80.1	180.4	69.7	62.2	37.8
1981	683.3	2.22	76.9	244.6	60.5	62.5	37.5
1991	846.4	2.16	74.5	314.1	59	59.7	40.3
2001	1,028.7	1.97	72.2	402.2	58.2	54.4	45.6
2011	1,210.9	1.5	68.9	481.9	54.6	45.1	54.9

Source: Registrar general of India as given in Agricultural Statistics at a Glance 2019, Directorate of Economics and Statistics (2020)

**Figure 4** India's exports and imports of principal agricultural commodities (value in rs crore) (see online version for colours)

Source: Agricultural Statistics at a Glance 2019, Directorate of Economics and Statistics (2020)

**Table 2** Top three food grains producing states (2018–2019)

<i>Crops</i>	<i>States</i>	<i>Production (in million tonnes)</i>	<i>Crops</i>	<i>States</i>	<i>Production (in million tonnes)</i>
Rice	West Bengal	16.05	Total nutri cereals	Rajasthan	7.06
	Uttar Pradesh	15.54		Karnataka	5.54
	Punjab	12.82		Madhya Pradesh	5.02
	All-India	116.42		All-India	42.95
Wheat	Uttar Pradesh	32.75	Total pulses	Madhya Pradesh	7.81
	Punjab	18.24		Rajasthan	3.68
	Madhya Pradesh	15.47		Uttar Pradesh	2.4
	All-India	102.19		All India	23.4
Maize	Karnataka	3.73	Total food grains	Uttar Pradesh	54.63
	Madhya Pradesh	3.68		Madhya Pradesh	32.8
	Bihar	3.02		Punjab	31.52
	All India	27.23		All-India	284.95

Source: Agricultural Statistics at a Glance 2019, Directorate of Economics and Statistics (2020)

Increasing demand for agriculture inputs and associated services such as cold storage and warehousing has also been seen in recent times. A target of around US \$ 60 billion agriculture export, to be achieved by 2022, has also been set by the agriculture export policy of the government of India (Sally, 2019). In terms of Foreign direct investment in the Indian food processing industry, the cumulative equity inflow is about US\$ 9.08 billion (April 2000 and March 2019). In the year 2018–2019, it is US\$ 628.24 million (FDI India, 2020).

#### 4 Research methodology, data analysis and interpretation

The present section deals with the analyses of factors affecting the agricultural contribution in India. The analysis is based on secondary data acquired from the World Bank database, International labour organisation, Indian meteorological department, and Directorate of economics and statistics (India). The study covers a period of around 23 years from 1995 to 2018, as before that the data for some of the selected variables are not available. Multiple Regression model has been applied to establish an empirical relationship among the dependent and independent variables.

The Regression model used in the present study is as follows:

$$AGDPR_{it} = \beta_0 + \beta_1 AGT_{it} + \beta_2 LE_{it} + \beta_3 INF_{it} + \beta_4 RAIN_{it} + \beta_5 INFR_{it} + \beta_6 EMPA_{it} + \varepsilon_{it}$$

where,

AGDP India's Agriculture value added as a percentage of GDP

AGT the ratio of Agricultural trade

LE Life expectancy at birth of the country

INF Inflation

RAIN Dummy variable for level of rainfall (Deficit = 0 and Normal = 1)

INFR Electric power consumption (kWh per capita) taken as proxy for infrastructure development

EMPA Employment in the Agriculture (% of total employment)

$\varepsilon$  error term

The descriptions of the variables used in the study are as follows:

##### 4.1 India's agricultural value added

The dependent variable is India's agricultural value added to GDP (AGDP). After subtracting intermediate inputs from the total output, value-added in the form of net output can be obtained, however, it does not take into account the depreciation deductions. It consists of the agriculture sector's net output consisting of fishing, livestock production, forestry, cultivation of crops, and hunting (Rick and Carol, 2007).

##### 4.2 Ratio of agricultural trade

The ratio between agricultural export and import prices represents the agricultural terms of trade. In the case of developing and emerging economies, it is expected to have a positive coefficient as with the increase in agriculture terms of trade there will be an increase in GDP contribution by the agricultural sector (Deb, 2002).

H01 India's AGDP is positively related to the ratio of agriculture trade in India



### 4.3 *Life expectancy*

The life expectancy of an economy is related to economic development and to achieve economic development, positive economic growth is a necessity. As the health status of the population of a country is directly related to the citizens' span of life particularly, it will lead to a higher level of economic development. Thus economies at a higher state of economic development have a higher level of life expectancy and will have a lower contribution towards the gross output of the agriculture sector. It is expected to have a negative sign coefficient (De Sormeaux and Pemberton, 2011).

H02 India's AGDP is negatively related to Life expectancy in India

### 4.4 *Inflation rate*

The coefficient of inflation can have either a positive or negative sign depending upon the source of inflation in the economy as cost-push or demand-pull inflation. Cost-push inflation occurs when there is a decrease in aggregate agricultural supply (because of raw material price increase or increase in wages) and demand-pull inflation occurs due to an increase in food demand and there is increased production level. In case of demand-pull inflation, it is expected to increase percentage contribution to GDP of agriculture while in case of cost-push, it is expected to decrease percentage contribution (Lipsey and Alec, 2003; De Sormeaux and Pemberton, 2011)

H03 India's AGDP is positively/negatively related to the inflation rate in India

### 4.5 *Rainfall (% departure)*

The agriculture sector in India highly depends upon rainfall. In different parts of India, the amount of rainfall varies from heavy to scanty. The agricultural productivity and sustainability in India is influenced by various factors and rainfall is one of them (Prasanna, 2014). Rainfall departure signifies the difference between the normal and the actual. It evaluates the temporal correlation of the groundwater level with the rainfall (Weber and Stewart, 2004). The level of rainfall is expected to have a positive relationship in terms of agricultural contribution as normal rainfall is positively related to the agricultural productivity in the country (Amare et al., 2018).

H04 India's AGDP is positively related to the level of Rainfall in India.

### 4.6 *Electric power consumption (Infrastructure development)*

As a significant input for production, electric energy is required in the production oriented agriculture sector of a country. It is used mainly in two forms, directly for the operation of equipment and machinery, lightning, etc., and indirectly for the production of fertilisers and chemicals for farming (Schnepf, 2004). The size and level of economic development of a country can be evaluated through its production and consumption of electricity (Esen and Bayrak, 2017). Therefore, electric power consumption has been taken as a proxy for infrastructure development and is expected to have a positive relationship with the agricultural contribution to GDP.

H05 India’s AGDP is positively related to the infrastructure development in India.

#### 4.7 Employment in the agriculture

Stages of growth and development of most of economies show broader shifts in employment from agriculture to industry and ultimately to the service sector (International Labour Organization, 2021). So, when an economy is having labour surplus, it can relocate its excess workers from one sector to other without loss of agriculture output (Lewis, 1954). In the case of India, as a developing nation, it is already having the highest amount of its workforce in the agriculture sector, expected to have a negative impact on the agriculture contribution to GDP with further additions in the agricultural employment.

H06 India’s AGDP is negatively related to employment in agriculture in India.

The variables in the present study have been taken in log terms to neutralise the unit effect. Multiple regression analysis has been applied in order to find out the relation among the dependent and independent variables and all the assumptions have been checked and are fulfilled before the analysis like Normality test, Serial Correlation test, Autocorrelation, multicollinearity and heteroskedasticity test (Annexures). The output of the multiple regression model has been presented in Table 3, signifying that among the selected variables, five variables are significant and one is having an insignificant impact, which can be used for accepting or rejecting the hypothesis.

**Table 3** Regression results

<i>Dependent variable: AGDP</i>				
<i>Variable</i>	<i>Coefficient</i>	<i>Std. error</i>	<i>t-Statistic</i>	<i>Prob.</i>
C	47.83298	4.278261	11.18047	0.0000
AGT	0.088969	0.031792	2.798487	0.0123
LE	-8.621384	0.729961	-11.81075	0.0000
INF	-0.017456	0.020361	-0.857329	0.4032
RAIN	0.048837	0.014948	3.267071	0.0045
INFR	0.050687	0.018622	-2.721919	0.0145
LEMPA	-2.137833	0.308927	-6.920186	0.0000
R-squared	0.974850	Mean dependent var		2.926774
Adjusted R-squared	0.965973	S.D. dependent var		0.165254
F-statistic	109.8234	Hannan-Quinn criter.		-3.813631
Prob(F-statistic)	0.000000	Durbin-Watson stat		1.401533

*Source:* Prepared by the authors based on Eviews output

The relationship between India’s AGDP and the ratio of agriculture trade in India is significant with a positive influence as the probability value (p-value) of AGT is 0.012, less than 0.05. The coefficient of life expectancy is negatively and significantly associated at a 5% level of significance with AGDP, as the probability value is 0.000. Inflation is having a negative and insignificant impact as the probability value is more than 5%, i.e., 0.403.

**Table 4** Summary of hypotheses

<i>Hypotheses</i>	<i>p-value</i>	<i>Decision at (5%)</i>
H01: India's AGDP is positively related to the ratio of agriculture trade in India	0.0123	Accepted
H02: India's AGDP is negatively related to life expectancy in India	0.0000	Accepted
H03: India's AGDP is negatively related to the inflation rate in India.	0.4032	Rejected
H04: India's AGDP is positively related to the level of Rainfall in India	0.0045	Accepted
H05: India's AGDP is positively related to the infrastructure development in India	0.0145	Accepted
H06: India's AGDP is negatively related to the agricultural employment growth in India.	0.0000	Accepted

*Source:* Prepared by the authors based on the data analysis

Rainfall is positively and significantly associated with the AGDP with a probability value of 0.004. The coefficient of infrastructure development and AGDP is positively and significantly related as the p-value is 0.014 which is less than 0.05. The result further shows that the agriculture employment growth is negatively and significantly related to the AGDP with a p-value of 0.000 at a 5% level. The result of the hypotheses has been summarised in Table 4.

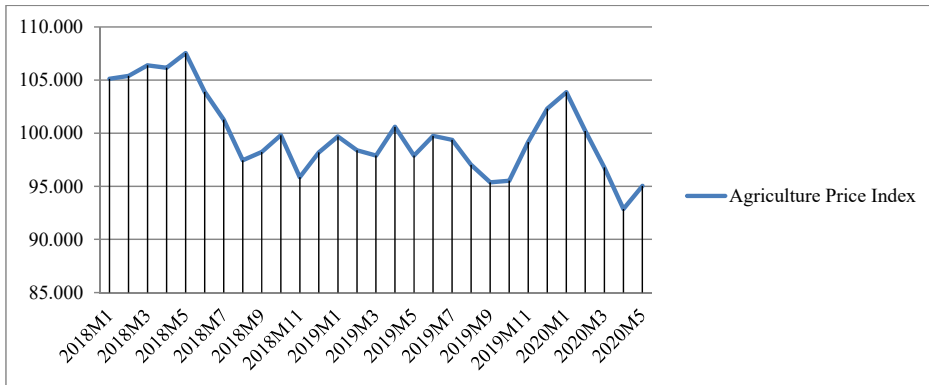
The emergence of the coronavirus has a harsh impact on each and every sector of the economies around the world, and India is no exception (Yadav and Iqbal, 2021). Consequently, among the above-analysed factors having an impact on the agricultural contribution in India, the situation of the pandemic COVID-19 has affected factors like agriculture trade, life expectancy, inflation, employment. The detailed discussion of the same is presented in the next section.

## 5 Effect of COVID-19 on the Indian agricultural sector

The COVID-19 pandemic will have a perpetual effect on the agriculture sector around the world. The livelihood of all the persons and farmers associated with the agriculture sector is at high risk during the present pandemic situation (FAO, 2020). World agriculture price index (Figure 5) has shown a sharp decline after the emergence of the pandemic from January 2020.

In the case of India, the pandemic has led to various restrictive measures like lockdown and limitation on the movement of transport vehicles leading to disrupting the supply chain (Figure 6). This has highly affected the agricultural products having a short shelf life in the initial period of the virus outbreak (Ananth, 2020). A change in GDP due to agriculture shock was expected to be around -1.4% leading to a decline in its contribution (Table 5). However, an increase in the average agriculture production has been witnessed during the pandemic for major agriculture commodities in India with a major loss in the associated agricultural activities such as supply chain, natural resources, energy, etc. (Beckman and Countryman, 2021).

**Figure 5** World agriculture price index (2016 = 100) (see online version for colours)



Source: International Monetary Fund (2020a)

**Table 5** COVID-19 and Shocks in India Economy (in 2020,% change from 2019)

<i>Production shocks in agriculture</i>	
Cotton	2.5
Dairy and dairy products	2.2
Rice	3.2
Oilseeds	4.5
Sugar	16.8
Wheat	4.5
<i>Other areas production and contribution</i>	
Natural resources	-17.1
Energy	-27.1
Clothing	-20.4
Labour manufacturing	-19.3
Actual GDP change	-13
Agriculture GDP change	-1.4

Source: Euromonitor (2021), ILO (2020), TDM (2020), WASDE (2020) and Beckman and Countryman (2021)

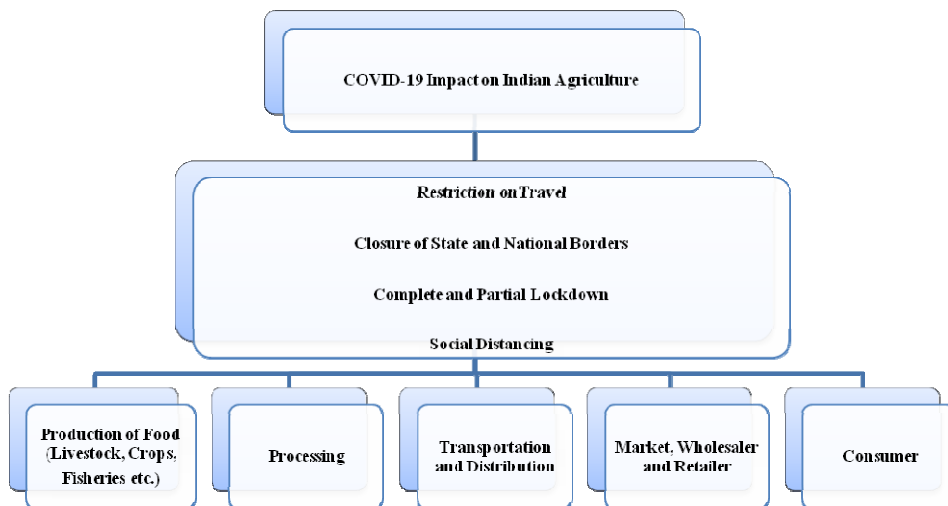
Furthermore, the other agriculture sectors faced shortage of labour supply and an inability to access the market. Production, revenue, and wage loss will be the severe result of the situation as in the production of the commercial crops most of the labour force is migrant of the other states (Vasudeva and Jebaraj, 2020). COVID-19 has lead to the states to close their borders with others states leading to labour shortages across both agricultural and non-agricultural sectors In addition to that, COVID-19 pandemic is not the only thing which has influenced the Indian agricultural sector, factors like earthquakes, flood, locust attacks, and Cyclone Amphan are also adding to the already caused distress (Marwah, 2020).

Some of the affected areas in the Indian agricultural sector due to COVID-19 are as follows:

### 5.1 *Effect on the availability of seed, fertilisers, and the production of crops*

For the production in the present season of the crop in India, the seeding process is not affected by the situation of COVID-19 but looking at the situation showing a rapid increase in the number of virus affected cases, it will surely affect the seeds supply. Further, disturbance in the global trade leads to a shortage of inputs like fertilisers and pesticides (The Economic Times, 2020).

**Figure 6** Impact of COVID-19 on Indian agriculture (see online version for colours)



*Source:* Prepared by the authors

### 5.2 *Procurement and falling price issues*

In India, at present various crops in Rabi season (like gram, wheat, mustard, lentil, etc.) are at their maturity level or the harvestable stage. For procurement and sale purpose the farm harvest reaches at mandis or market at this time. However, due to the coronavirus, there is restrictive access to the market, border closure at the state level, and transportation issues, which initiated the falling prices of crops and an increase in labour costs. Further, a lack of sufficient storage facilities has also emerged (Padhee and Carberry, 2020).

### 5.3 *Decrease in supply of labour*

Lockdown has initiated reverse migration of labour in India at a very large level which resulted in disruptive agricultural operations, migrant labour shortage, and a sharp increase in daily wages for harvesting crops (Vasudeva and Jebaraj, 2020).

### 5.4 *Sales restrictions, public goods scarcity and disruptive supply chain*

Inter-State and Intra-State restrictions are imposed by various states in India which have impacted the supply or movement of labours/farmers, produce (like foodgrain, livestock,

fisheries, etc.) and farm-related machines. The disruptive supply chain has affected the supply of farm produce like vegetables, fruits and foodgrains in both urban and rural areas and it has also sternly impacted the transportation of the public distribution system (Ramakumar, 2020).

### *5.5 Money and debt issue*

In India, most of the crop loans are repaid during the period of April-May and with the beginning of the new season, fresh loans are granted to the farmers. However, the pandemic has affected their cash flow and generated fear to borrow money from the informal sector at a higher interest rate (Kak, 2020).

### *5.6 Decline in international trade*

As International borders of various nations are closed it has led to a decline in international trade, which might generate food insecurity at the international level (United Nations, 2020b).

The government of India is taking initiatives to counter the effect of the crisis as it has already announced a relief package worth \$ 22 billion in the first phase consisting of cash transfers and food distribution to the highly vulnerable section. Credit facility to street vendors and concessional credit to farmers are some additional support. In the agriculture sector, the policy scheme is essential in terms to develop the infrastructure (IMF, 2020). In the third tranche of the measures, the government of India has announced 'Atmanirbhar Bharat Abhiyan' in which the main focus is on agriculture and allied activities. In this, an amount of one lakh crore rupees will be given to farmer produce organisations, agricultural cooperative societies, and start-ups to increase infrastructure based on farm-gate (Agarwal, 2020). For the formalisation of micro-food enterprises, cluster-based farming, allotment is of around rupees ten thousand crores. To boost animal husbandry and infrastructure, an amount of rupees fifteen thousand crores, in which rupees twenty thousand crores for fisherman under PM Matsya Sampada Yojna, which will lead to increase in fish production of around seventy lakh tones over five years. Thirteen thousand crore rupees has been allotted for the vaccination of various livestock like cattle, buffalos, goats, pigs, and sheep. Provisions for reforms in agricultural marketing needs are to be initiated for the farmers in India (Chetia, 2020; Jebaraj, 2020).

Although various economists (like Abhijit Banerji and Esther Duflo) believe that the amount of the relief package is very small when compared with the vulnerable section population and if the GDP of India is to be taken into consideration it is only 0.85% of the GDP. Most of the economists are of the view that both at the central and the state level, the government should take initiatives in terms of increasing spending amount even it will add to the fiscal deficit of the economy. The relief package by some of the Asian countries, European nations and United States are higher compared to what India has offered (Bloomberg Quint, 2020; Dev, 2020).

## **6 Conclusions**

The main factors that determine the agricultural percentage contribution to GDP in India are agriculture trade, life expectancy, level of rainfall, infrastructure development and

employment in the agriculture sector. Agriculture trade contributes positively and significantly while life expectancy has negative and significant contributed towards agriculture in India. India is an emerging economy, its higher level of development is associated with the increased life expectancy and it also signifies that with an increase in development comes the shifting of resources from agriculture to manufacturing and services. Employment in the agriculture sector is having a negative and significant impact as agriculture sector in India already provides employment to large number of people, therefore, further additions in the employment will not have a positive effect in the agricultural productivity. Moreover, agriculture production in India significantly depends upon the status of the rainfall as normal amount of rainfall leads to increase in the productivity of the sector. Agriculture trade has also contributed positively showing that the policy of the government towards the agriculture sector in India is outward-oriented. Further, the development in terms of infrastructure (access to electricity) also contributed positively and significantly in the enhancement of the productive capacity of the sector through the use of advance machines and techniques.

The situation of the pandemic COVID-19 has become severe for Indian economy and the primary reason for such severity might be its status as a developing economy which is highly agro-based. The impact of the pandemic is not only in health terms, it affected the economy both socially and economically. The result of the preventive measures has mainly lead towards increased level of unemployment and survival risks in terms of high living costs. The return of migrants to their native villages has created a pressure over the already lacking opportunities in the rural India. On the other hand, some communities are facing labour shortages due to migration. Along with this, disruptions in the supply chain have also interrupted the supply, distribution and consumption of the agriculture production. In addition to that the COVID-19 virus is continuously evolving showing no future sign of its early ending, therefore, it can be concluded that to fight against the COVID-19 repercussions on the Indian agricultural sector, internal factors associated with the sectors like the labour force (both formal and informal) which are directly or indirectly associated with the sector, credit facility, and supply chain are highly significant. Presently, the support from the government institutions is the key to the survival of the people allied and the functioning of the agricultural market.

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