IMPACT OF COVID – 19 ON THE AGRICULTURE SECTOR OF INDIA WITH SPECIAL REFERENCE TO KERALA

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As part of the summer internship project

ABSTRACT

Agriculture sector lays the foundation of the Indian economy and has a direct bearing on the socio – economic structure of the country. Agriculture is the primary source of livelihood for about 70 per cent of the population and contributes 17 – 18 per cent to the country's GDP. Like rest of the sectors in the economy, COVID – 19 has influenced the agriculture sector in a negative manner. This paper highlights the impacts of the pandemic on the agriculture sector of India and addresses the problems faced by the farmers due to the sudden lockdown, with special reference to Kerala. The methodology used in this paper is both primary and secondary research. To collect the first hand information from the farmers an unstructured interview was scheduled with the farmers and due to the pandemic – induced lockdown restrictions some of the interviews weren't fruitful. The survey illustrates the magnitude of distress confronted by the farmers due to the pandemic. According to the survey results, the income of the farmers have been reduced by more than half thus making it difficult for them to meet their daily needs and such a large scale reduction in income has pushed many famers into a debt trap. In addition to that the major problems faced by the farmers are labor shortage, disruption of supply chains, lower price for yield and an uncertain future. This paper also specifies the steps the government and its authorities need to adopt to uplift the farmers from the ongoing crisis. The authorities need to implement policies at a micro level with an immediate effect on the farmers and the agriculture sector in a holistic manner otherwise the economy will experience a deep – rooted agrarian crisis. Currently the authorities and the farming communities have initiated several steps to deal this crisis. The farmer's cooperatives undertook the harvesting activities owing to labor shortage and the government provided both financial and policy support to the farmers. Apart from the pandemic – induced policies to revive the sector from the ongoing crisis the government should adopt a series of sustainable development policies to withhold the agriculture sector in the upcoming years and to ensure sustainable productivity in the sector. This paper also specifies the sustainable development policies that the sector need to get exposed to, comprising increased investments in R&D[i] and infrastructure, etc.

INTRODUCTION

"THE CURE IS MORE DANGEROUS THAN THE DISEASE"

The Pandemic induced lockdown has a devastating effect on the economies all over the world. The effect on the Indian economy was catastrophic; the $3 trillion Indian economy may lose approximately $30 billion in size witnessing negative growth for the first time since Independence. Added to this, there will be negative inflation and a deep - rooted demand deficit. In wake of the COVID - 19 crises, the agriculture sector was downgraded to an insignificant position, causing greater hardship to the farmers. Agriculture along with its allied sector is the largest source of livelihood in India. Nearly 70 per cent of the population depends upon agriculture and the sector contributes around 15.8 per cent to the GDP of the country.

Agricultural sector comprises of farming of crops, pisiculture, animal husbandry, fisheries, horticulture, agro – forestry, food processing, etc. India is the world's largest producer of many

fresh fruits like banana, mango, guava, papaya, lemon and vegetables like chickpea, okra and milk, major spices like chilli, pepper, ginger, fibrous crops such as miller and castor oil seeds and the second largest producer of wheat and rice. India is currently the world's second largest producer of several dry fruits, agriculture based textile raw materials, roots and tuber crops, pulses, farmed fish, eggs, coconut, sugarcane and numerous vegetables. India is ranked under the world's five largest producers of over 80 per cent of agricultural products, including many cash crops such as coffee and cotton. India is one of the world's five largest producers of livestock and poultry meat, with fastest growth rate. Agricultural exports from India reached US $38.54 billion in FY19 and US $28.93 billion in FY20 (till January 2020). Over the past years the sectoral contribution of agriculture towards the GDP of the country is declining. The sector experiences a downward trend predominantly due to a reduction in labor supply and a consequent increase in farm wages affected the profitability of the farmers adversely. Apart from that, inept infrastructure facility like transportation, warehouse and cold storage has increased the spoilage rate and hampered the productivity of the sector. Even before the pandemic the sector was at the verge of collapse and now due to this crisis the sector has completely gone out of track. Government should undertake concrete policies to bring the farming sector back to normal otherwise the economy will experience a deep-rooted agrarian crisis.

Kerala is a southern Indian state, where two – third of the population depends upon agriculture for livelihood. The state is famously known for its premium quality spices across the globe. Coconut has the largest cropped area in the state followed by rubber and the third is paddy. Currently the cropping pattern of Kerala is dominated by cash crops, food crops comprising rice, tapioca and pulses account for just 10.21 per cent of the total cultivated area in 2017 -18, while cash crops(cashew, rubber, pepper, coconut, cardamom, tea ,coffee) accounts for about 62.8 per cent of the total cultivated area. In recent times the agricultural economy of the state witnessed a structural transformation from traditional crops like paddy and tapioca to more remunerative crops like banana, pineapple and other plantation crops. Lower cost of production and higher rate of return from plantation crops resulted in such a shift.

This paper analysis the impacts of COVID – 19 on the agriculture sector of Kerala and the possible solutions to revive the sector from this crisis. According to the survey, COVID – 19 has hampered the productivity and growth of the agriculture sector, throwing many farmers into debt trap. The incomes of the farmers have also been reduced by more than half due to which they are trying hard to feed their hungry families. The major difficulty faced by farmers was the lower price for their yields. Price of the agriculture products was reduced by 67 per cent due to which they were only able to recover just 33 per cent of the production cost. Selling the products at a throw away price made it difficult for the farmers to pay the rent for the lease land, payment of interest rates and to meet their daily needs. The workforce in the farming sector of Kerala is mostly migrant workers and eventually these workers are the backbone of this sector. Currently the sector is facing a huge labor shortage due to a large scale reverse migration of these workers to their homeland, which will adversely affect the production and growth of the agricultural sector of Kerala. Due to large scale labor shortage most of the farmers were not able to carry their harvesting process smoothly. The supply chains were disrupted due to lockdown, making it difficult for the farmers to transport their produce to the final market resulting in huge spoilage rates. According to many farmers the financial crisis they are facing now is really tragic. Most of the farmers have decided to leave the sector and look for some other jobs that provide a promising remuneration to them. A strong government intervention is essential to bring back the

farmers to normalcy. But currently the government has not taken any stern policies to support the farmers and the authorities should undertake policies with immediate effect, otherwise the economy will experience an imminent agrarian crisis. One of the notable decisions by the government was the declaration of a moratorium period of six months. But the resolution was not so welcoming to the farmers, because the main problem faced by farmers are cash crunch and a moratorium will only give them an exception from interest payments for a specific time period and it will not lead to any inflow of cash into their hands.

Government should adopt policies that ensure economic stability to the farmers such as direct cash transfers will boost their purchasing power and improve their living standards. The authorities should also take steps to write off their loans or should be willing to bare a portion of their losses. In order to restart the business cycle of the economy and to bring the agriculture sector back to normalcy, the government should invest more on agricultural infrastructures like warehouse, cold storage and properly functioning road, railway and port services. Such investments will definitely revive the negative inflation and demand deficit of the economy in the long – run. For the farmers the future is ambiguous and many don't have enough capital to finance the next sowing season, so the government should financially support the farmers to purchase seeds, fertilizers and other farm inputs to carry out the farming activities. Government should allow easy movement of migrant workers across the country to restart the pending works of the economy and to avoid the negative growth due to labor shortage.

Analyzing the past performance of the agriculture sector reveals that the GVA[ii] by agriculture and allied sectors have reduced to US $202.43 in FY20 from US $271 in FY18 and the exports have also been reduced significantly. In addition to this, farmers income have also been reduced over the past years resulting in large scale migration of workers to other sectors and currently the sector is experiencing massive labor shortage. In order to make the backbone of the Indian economy stronger in the forthcoming years the government should adopt a series of sustainable development policies to achieve a holistic growth in the agriculture sector. Adoption of capital intensive farming practices will solve the problem of labour shortage and will enhance productivity. Government should adopt public private partnership in agriculture sector to boost investments in R&D and infrastructure. If appropriate changes are made in the agriculture sector, India can eradicate its hunger and malnutrition and can be a major source of food supplier in the world.

The paper is divided into four parts. Part one gives an overview of the agriculture sector in India and Kerala. Part two specifies the impacts of COVID – 19 on the farming sector of India. Part three mentions the policies or steps the government and its authorities need to undertake to revive the agriculture sector from the ongoing crisis. In addition to that it also highlights the sustainable development policies that are necessary to achieve sustainable productivity in the agriculture sector in the upcoming years. Part four explains the implication of COVID – 19 on various segments of the society.

PART I

AGRICULTURAL SECTOR IN INDIA AN OVERVIEW

Agriculture plays a vital role in the Indian economy it includes farming of crops, animal husbandry, pisciculture, agro-forestry, etc. Agriculture along with fisheries, forestry and other allied sectors contribute around 15.8 per cent to the GDP of the country. Agriculture along with its allied sectors is the largest source of livelihood in India, nearly 70 per cent of the population depends upon agriculture with 82 per cent of the farmers being small and marginal. India ranks first in the world with the largest cropped area followed by US and China. India has the 10th largest arable land in the world with 20 agro – climatic regions and the country experiences all 15 major climates in the world. The country also has 46 out of the 60 soil types in the world, making India suitable for cultivating almost all varieties of crops. The economic contribution of agriculture towards India's GDP is declining steadily. But still agriculture is demographically the broadest sector and plays a vital role in the socio-economic structure of the country.

Based on the seasons, the crops in India are divided into:

- Kharif

These crops requires a lot of water and hot weather to grow, due to which they are sown in June – July and harvested in September – October. The major kharif crop is rice. And the other crops are Jowar, Bajra, Maize, Cotton, Pluses, Sugarcane, etc.

- Rabi

Sown in October – November, these crops require warm climate for germination of seeds and for maturation and, cold climate for the growth. It is mainly harvested in April – May. The major Rabi crop is Wheat. And the other crops are Oats, Gram, Pea, Barley, Potato, Tomato, Onion, Oil Seeds, etc.

- Zaid

Grown between the Rabi and Kharif season (March – June).
Example: Cucumber, Pumpkin, Watermelon, Muskmelon, Moong Dal, etc.

ACHIVEMENTS

During 2018-19 crop years, food grain production is estimated at record 283.37 million tonnes and the gross irrigated area under food grains is estimated to have grown to 64.8 million hectares in FY19. As of November 2019, total area sown with rabi crops in India reached 95.35 million hectares. Uttar Pradesh is one on the largest states in India and is the largest agricultural contributor. The state has a cultivated area of 16.68 million hectares (around 76 per cent of its total land area). Uttar Pradesh contributes 41.1 million tonnes of food grains to the country, the state is also the major producer of food grains like wheat and paddy and also the largest producer of milk(16 per cent of total) and potato(43 per cent of total). India is the largest producer of spices, pulses, milk, tea, cashew, and jute, and second largest producer of wheat, rice, fruits and vegetables, sugarcane, cotton and oilseeds. As per the 2014 FAO[iii] world agriculture statistics India is the world's largest producer of many fresh fruits like banana, mango, guava, papaya, lemon and vegetables like chickpea, okra and milk, major spices like chilli, pepper, ginger, fibrous crops such as miller and castor oil

seeds. And the second largest producer of wheat and rice, the world's major food staples. India is currently the world's second largest producer of several dry fruits, agriculture based textile raw materials, roots and tuber crops, pulses, farmed fish, eggs, coconut, sugarcane and numerous vegetables. India is one among the five largest producers of over 80 per cent of agriculture products in the world, including many cash crops such as coffee and cotton. India is one of the world's five largest producers of livestock and poultry meat, with one of the fastest growth rate.

In 2011, Indian agriculture accomplished an all-time record production of 85.9 million tonnes of wheat, a 6.4 per cent increase from the previous year. Rice output in India hit a new record of 95.3 million tonnes, a 7 per cent increase from the year earlier. Lentils and many other food staple productions also increased. India has shown a steady average nationwide annual increase in the kilograms produced per hectare for some agricultural items, over the last 60 years. These gains have come mainly from green revolution, improving road, power generation and storage infrastructure, knowledge of grains and reforms. Digitalization of the sector has also contributed towards its growth, the Electronic National Agricultural Market (e – NAM) was launched in April 2016 to create a unified market for agricultural commodities by networking existing APMCs[iv]. Up to May 2018, 9.87 million farmers, 109,725 traders have registered on the e – NAM platform and 585 mandis[v] have also been linked. Despite these recent accomplishments, the sector has the potential for major productivity and total output gains because the crop yields in India is still just 30 to 60 per cent of the best suitable crop yields achievable in the farms of developed and other developing countries. Apart from that, a post-harvest loss due to poor infrastructure and unorganised retail is highest in India.

EXPORT – IMPORT MARKET

The Indian food and grocery market are the world's sixth largest, with retail contributing 70 per cent of the sales. The Indian food processing industry accounts for 32 per cent of the country's total food market, one of the largest industries in India and is ranked 5th in terms of production, consumption, exports and expected growth. It contributes around 8.8 and 8.39 per cent of the GVA in manufacturing and agriculture respectively. India's export of processed food was ₹31,111.90 crore in FY19 and the FDI in India's food processing sector stood at US $9.78 billion between April 2000 and December 2019. Agricultural exports from India reached US $38.54 billion in FY19 and US $28.93 billion in FY20 (till January 2020), making India among the 15 leading exports of agricultural products in the world. The key agricultural and allied products exported from India in FY20 are marine products, basmati rice, buffalo meat, spices, non – basmati rice, cotton, oil meals and sugar. Marine products record the highest exports of about US $5.9 billion. India's sugar exports are estimated to cross 5 million tonnes in the current marketing year ending September 2020 and the coffee exports stood at 286.95 million tonnes in FY20. Most of its agriculture products serve developing and least developed nations. Indian agriculture / horticulture and processed foods are exported to more than 120 countries, primarily to Japan, South East Asia, SAARC countries[vi], the European Union and the United States. India is the fastest growing exporter of agricultural products over the last 10 years, and one of the largest supplier of rice, wheat, cotton, sugar, wheat, milk, spices, fruits and vegetables in the world.

HORTICULTURE, DIARY FARMING AND AQUACULTURE

The total production and economic value of horticulture products such as fruits, vegetables, nuts, etc. has doubled in India over the past years. Recently the Department of Agriculture Cooperation and Farmers Welfare released the third advanced estimate (2018-19) of area and production of various horticulture crops. As per the report, the total horticulture production in the country is estimated to be 313.85 million tonnes which is 0.69 per cent higher than the horticulture production of 311.71 million tonnes in 2017-18.The area under horticulture crops has increased to 25.49 million hectares in 2018-19 from 25.43 million hectares in 2017-18. The country is also the 2nd largest producer of fruits and vegetables in the world after China. During the FY13 India exported horticulture products worth ₹14,365 crore, nearly double the value of its exports in 2010. Dairy farming is also an emerging sector in the Indian economy, which provides livelihood to about 70 million households. The milk production in the country stood at 187.7 million tonnes in 2018-19, achieving a growth of 6.5 per cent and making India the largest producer of milk in the world. The country also has the largest livestock population of around 535.78 million. Indian fisheries and aquaculture is an important sector of food production, provides nutritional security besides livelihood support and gainful employment to more than 14 million people, and contributing to agricultural exports. The sector is the fastest growing industry from 1990 onwards, the Indian fish captive harvest doubled while aquaculture harvest tripled, making India the 4th largest producer of fish in the world. The total fish production during 2017-18 is estimated to be 12.60 million metric tonnes, of which nearly 65 per cent is from inland sector and about 50 per cent of the total production is from culture fisheries, and constitutes about 6.3 per cent to the global fish production. More than 50 different types of fish and shellfish products are being exported to 75 countries around the world. Fish and fish products have presently emerged as the largest group in agricultural exports from India, with 13.77 lakh tonnes in terms of quantity and ₹45,106.89 crore in terms of value. This accounts for around 10 per cent of the total exports and nearly 20 per cent of the agricultural exports, and contribute to about 0.91 per cent of the GDP and 5.23 per cent to the aggregate GVA.

EMPLOYMENT

Employment in agriculture in India (per cent of total population) was 43.21per cent as of 2019. Its highest value over the past 28 years was 63.05 per cent in 1991, while the lowest was in 2019. The sector provides employment to not only to the adult males of the household but also to the women of the household. Women work extensively in each stage of production of major grains and millets, in land preparation, seed selection and seedling production, sowing, applying manure, weeding, transplanting, threshing, winnowing and harvesting. It is an established fact that as the economy advances, there is a movement of workers from low productive agriculture sector to high productive sectors. And in India this transformation has led to significant decline in the absolute number of people employed in the agriculture sector. According to the NSSO's rounds on employment and unemployment shows that the percentage of people employed in the Indian agriculture sector has been declining, from 60 per cent in 1999 – 00 to 49 per cent in 2011 – 12. There has been a net reduction of 30.57 million labours from the agriculture sector. The above data highlights the

fact that fewer people are being added to the agriculture workforce and a large scale net migration of workforce to the other sectors. Factors such as high remuneration and growth opportunities in alternative sectors along with relatively lower wages in agricultural sector drives the workforce to migrate to other sectors. This has resulted in labour shortage and consequent escalation of cost of cultivation. This reduction in supply of labour along with many government schemes such as MGNAREGA[vii] has led to an increase in farm wages which adversely affected the profitability of farmers. According to reports, the rural wages have gone up by 17 per cent on an average since 2006 – 2007, at the same time increase in wages without an increase in productivity has led to inflation. 78 per cent of the labour reduction has been reported in Uttar Pradesh, Karnataka, West Bengal, Bihar, and Rajasthan. And the labour reduction has several affected the productivity of certain crops which are labour intensive and are also grown widely in the country, such as paddy, wheat, cotton, sugarcane and groundnut.

AGICULTURE FOOD SUPPLY CHAINS

Agriculture food supply chains and networks play an important role in providing farmers access to market. Agriculture supply chain covers an entire chain of activities from production on the farm to processing, distribution and retailing to consumers. There are two main types of agriculture food supply chains, namely agriculture food supply chains for fresh agriculture products and a supply chain for processed food products. The supply chains also include transportation, warehouse, and cold storage in broad scene it also includes product development, marketing and finance. Agriculture based cooperatives plays an important role in the supply chain system, starting from the production to the distribution of these products. The commodities that are mostly handled by the cooperatives are food grains, jute, cotton, sugar, milk, fruits and nuts. Currently there are more than 25,000 cooperatives in India. Apart from that cooperative banks also play an important role in providing credit to rural parts of India, thus helping the farmers to be economically stable. But the agriculture supply chains in the country are weak, resulting in limited access of farmers to the market, lack of infrastructure and storage facilities like warehouse and cold chains led to heavy harvest losses. Added to this, the farmers are extensively exploited by the middlemen, resulting in huge difference between the price farmer's gets and the amount final consumer pay.

DRAWBACKS

Currently the agricultural practices followed in India are neither economically or environmentally sustainable and the agriculture productivity is declining over the past years. Gross fixed capital formation in agriculture decreased from 17.7 per cent of GVA in 2013 –14 to 15.2 per cent of GVA in 2017 – 18. The country lacks in cold storage, food packing, as well as a safe and efficient rural transportation system, this causes one of the world's highest food spoilage rates particularly during monsoon and other adverse weather condition. Added to this, regional floods, poor seed quality, inadequate irrigation facilities, inefficient farming practices, lack of availability of funds and labour shortage causes more damage to this sector. The biggest problem of farmers is the low price for their farm products, the Indian farmers receives just 10 per cent to 23 per cent of the price the consumers pay for the product and the rest is taken by the middlemen who extensively exploits the farmers. Whereas farmer's in the

developed economies of Europe and US receive 64 per cent to 81 per cent. Indian agriculture includes a mix of traditional and modern farming techniques. In some parts of India, traditional use of cattle to plough the plot is still practiced and the farms that use the traditional methods have some of the lowest per capita productivity and farmer's income. Due to all the shortfalls India's total productivity remains 2 per cent per annum, in contrast china's total productivity grows at 6 per cent per annum. In 2012, the NCRB[viii] reported 12,754 farmer suicides in India. Farmer suicides account 11.2 per cent of all suicides in the country. Andra Pradesh, Maharashtra, Chhattisgarh, Kerala and Karnataka top the list in farmer suicides. Financial debts are one of the major reason for the suicides, these debts occur due to price hike in fertilizers, seeds, labor cost and other farm outputs, lower yield, unexpected climatic changes, water scarcity, unstable income, government policies, personal issues and family problems. And if appropriate changes are made in the agriculture sector, India can eradicate its hunger and malnutrition and can be a major source of food supplier in the world.

KERALA

Kerala being a coastal region it has a unique and diverse agro – climatic specialties, which enable the state to cultivate different types of crops. The presence of 34 lakes, backwaters and other water bodies and 44 rain fed rivers flowing through the state and an annual rainfall of 3000mm facilitates agriculture to a great extent in the state. Agriculture and other allied sectors play a crucial role in the economy of Kerala, as they provide livelihood to approximately two – third of the population. About 92 percent of the farmers are small and marginal. But the GSVA[ix] of agriculture and other allied sector in the state has declined from 13.7 per cent in 2012 – 13 to 10.5 per cent in 2016 – 17. In the recent times the agricultural economy of the state is witnessing a structural transformation from its traditional crops like paddy and tapioca to more remunerative crops like banana, pineapple and other plantation crops. Currently the cropping pattern of Kerala is dominated by cash crops. Food crops comprising rice, tapioca and pulses account for just 10.21 per cent of the total cultivated area in 2017 -18, while cash crops(cashew, rubber, pepper, coconut, cardamom, tea ,coffee) accounts for about 62.8 per cent of the total cultivated area. Over the several years the area cropped under paddy, tapioca and cashew have reduced, whereas area cropped under plantation crops like pepper, ginger, turmeric, cardamom, banana, pineapple has increased. People shifted to plantation crops because the production cost for these crops are lower as compared to rice and tapioca, and the rate of return is also higher. Coconut (30 per cent) has the largest cropped area in the state followed by rubber (20.9 per cent) and the third is paddy (7.4 per cent).

FOOD CROPS

Among the food crops the most essential or stable crop is rice or paddy. About 600 varieties of rice are grown in the fields of Kerala. In fact Kuttanad region of Kerala is known as the rice bowl of the state and enjoys significant status in the production of rice. Rice occupies 7.46 per cent of the total cropped area of the state. However, the area under rice has been falling at an alarming rate ever since the 1980s. During 2016-17 the production of rice

decreased from 5,49,275 tonnes to 4,36,483 tonnes, over the previous year it showed a decrease of -20.54 per cent. During the year drought had intensively affected all over the state especially in Palakkad district, which lead to a fall in the production. Palakkad, Alappuzha, Thrissur and Kottayam accounted for about 79.6 per cent of the total area of rice in the State, their individual shares being 39.8 per cent, 19.2 per cent, 11.5 per cent and 9.2 per cent respectively. These Districts contributed 81 per cent of the total rice production in the State. Next to rice is tapioca and it is mainly cultivated in drier regions and tapioca is the major food of Keralites, which account for about 2 per cent of the total cropped area.

CASH CROPS

Among the cash crops coconut occupies the largest area with 29.14 per cent. In fact Kerala produces 95 per cent of the total output of coconut in India and it is also a principal source of income to the people in the choir industry. Kerala's share in area as well as production of coconut in the country, which stood at for 69.58 per cent of the area and 69.52 per cent of the production in 1960-61, has declined to 37.6 per cent and 31.9 per cent respectively in 2016-17. A further decline of 2.8 per cent in production is recorded in the State in 2017-18. Production of coconut is concentrated specifically in Malappuram district followed by Kozhikode and the lowest production is in Idukki district. Area, production and productivity of coconut is showing a decreasing trend which is mainly due to the prevalence of the root wilt disease, poor crop management and the existence of senile and unproductive palms. Hence, massive replanting of palms affected by root wilt with elite palms and elimination of senile palms, setting up of nurseries for production of quality seedlings and their subsequent distribution is essential for increasing productivity. Rubber occupies the second largest area in the State next to Coconut with 21 per cent of the gross cropped area. No considerable change with respect to area and production is observed in the State in 2017-18 compared to 2016-17. Kerala's share to country's rubber production was 78 per cent in 2017-18 .The area and production of Rubber is maximum in Kottayam district and it is minimum in Alappuzha district. The state is also a major producer of spices, important spices are cardamom, cinnamon, clove, pepper, nutmeg, vanilla and turmeric and Kerala accounts for 59 per cent of the national production of pepper in 2017-18 with 37,955 tonnes. India is the second largest producer of small cardamom and plays an important role in the international trade of cardamom. Kerala topes the position in cardamom production and contributes 88 per cent to the total production in the country. The cardamom production in the State has increased by 7 per cent in 2017-18 compared to 2016-17 recording 18,350 metric tonnes. Other cash crops that constitute the agricultural sector are tea, coffee, cashew, pulses, areca nut and ginger. In the state, the production of coffee increase from 63,476 million tonnes in 2016-17 to 66,465 million tonnes in 2017-18 with no change in area. The productivity of the crop in terms of bearing area in Kerala is 782 kg/ha, which is higher than the national level of 765 kg/ha in 2017-18.[x] Major variety grown in Kerala is Robusta with a share of 97.1 per cent in planted area. Kerala accounts for 4.69 per cent of the total domestic production of tea in the country. The production of tea in the State has shown a marginal increase since 2015-16 despite the area under the crop remaining the same. Tea production recorded an increase of 1.2 per cent in 2017-18 compared to 2016.

DAIRY FARMING AND HORTICULTURE

Dairy farming is also one of the major sources of income to the farmers in Kerala. In 2016, the milk production in Kerala reached a volume of 3.5 billion liters, growing at a CAGR[xi] of 5.6 per cent during 2010-2016. The state currently represents the twelfth largest dairy market in India. The milk production in Kerala mainly consists of cow milk and buffalo milk. The report's analysis concludes that cow milk dominates the total milk production, accounting for around 98 per cent of the total share. In 2018 Kerala government declared jackfruit as its official fruit with an aim of promoting 'Kerala jackfruit' as a brand in markets across the country and abroad, showcasing its organic and nutritious qualities. Around 32 crore jackfruits are produced in the state annually. Pineapple cultivation in the state is also gearing up in the recent years the Mauritius variety dominates Kerala farms. Of the roughly 18,000 hectares under cultivation, about 95 per cent is under the variety and the remaining is MD2 variety. About 1,700 crore worth of revenue is generated from pineapple farming in the country, from that 85 percent of the revenue comes from Kerala. Kerala has been leaning on neighboring Tamil Nadu and Karnataka to meet its daily vegetable and fruit demands as it is a consumer state. But vegetable production in the state has increased from 6.5 lakh tonnes in 2016 to 9.5 lakh tonnes in 2019. Supply chains in Kerala are characterized by numerous intermediaries and distributors. Kerala also has proper warehouse, cold storage and proper transportation channels but still the state lacks in infrastructure development. Farmer's cooperatives also play a major role in providing agricultural products directly to the customers. Apart from this, collective farming through Kudumbasree, aims at ensuring food security at household and community level. The major crops cultivated are paddy, vegetables, banana, pineapple and tubers.

PART II

IMPACT OF COVID – 19 ON THE FARMING SECTOR

Even before COVID – 19 the agricultural sector was in a crisis situation, the contribution towards GDP was also declining over the past years. The sector is characterized with lower productivity due to inefficient farming practices, poor infrastructure, labor shortage etc. And now due to COVID – 19 the sector has been completely destroyed. A proper and efficient government intervention can only put the sector back to normal. To analyze the impacts of COVID – 19 on farmers and the agricultural sector, this particular survey was conducted on the farmers of Kerala.

SHORTAGE OF LABOUR

The workforce in the farming sector of Kerala is mostly migrant workers and eventually these workers are the backbone of the sector. They are involved in each stage of the farming process, from land preparation, seed selection, sowing seeds,

applying manure, watering the plants, harvesting and transporting the products to the final market. Currently the sector is facing a huge labor shortage due to a large scale reverse migration of these workers to their homeland. This will adversely affect the production and growth of the agriculture sector. Lockdown was declared at the time of harvesting season due to which most of the farmers were not able to find workers, which affected their harvesting and further marketing of the agriculture products. To avoid the labor deficit negative growth in this sector, the government should enable the movement of these workers across the country with minimal restriction.

DISRUPTION OF THE SUPPLY CHAIN

The lockdown period of March, April, May and June were the peak season for many agriculture products, especially fruits like pineapple, jackfruit, banana, and etc. Transportation facilities were disrupted due to the lockdown restrictions as the result most of the farmers were not able to make their produce reach the final market. And there wasn't fully functioning warehouse or cold storage to store their products and due to all these limitations the spoilage rate was very high.

LOWER PRICE FOR YIELD

COVID – 19 and its subsequent lockdown has led to a reduction in the purchasing power of the society and the agriculture sector also experienced a reduction in demand for farm products. Due to a sudden fall in demand and an excess supply of agriculture products, the prices of all the agricultural products were reduced by around 70 per cent. As the result farmers were not able to recover their production cost and most of them were only able to recover just 30 per cent of the production cost. And the incomes of the farmers were reduced by more than half due to which they are trying hard to meet the ends. Many are not even able to pay the interest for the loans they have taken from the unorganized moneylenders.

PENDING DUES

The farmers in Kerala supply their produce all over India and export it to foreign countries. And lockdown has led to the closure of markets across India and in abroad, due to which most of the farmers did not receive their payments timely. The cash payment for the products that were exported even before the lockdown is also pending. And all these pending dues add up to crores of rupees. This situation has made the farmers economically unstable and most of them are not even able to meet their daily needs, like paying rent for the land taken on contract basis and even to meet their family needs.

UNCERTAIN FUTURE

Most of the farmers have already invested their money in crops that can be harvested in the consecutive years and some of them have also done investments in a three year basis. And currently these farmers are in a stand still situation because they don't have sufficient labor to carry out the farm work, enough capital to purchase fertilizers and other agricultural inputs and they don't even have a promising market to sell their farm products at a profitable rate.

EXPORT IMPORT MARKETS

India's export during March 2020 was $21.4 billion, which is approximately 35 per cent lower than the March 2019 exports.[xii] Some commodities have registered a decline by over 30 – 40 per cent, particularly cereals and meat. Due to the pandemic the global demand has fallen significantly and many orders have been canceled. Further the disruption of the export import supply chains due to the ongoing lockdown has adversely affected the international trade and the situation is likely to worsen in the upcoming months.

The agricultural sector has been severely affected due to COVID – 19 and for the farmers the future is bleak, were many are uncertain about their existence in the sector. According to many farmers the financial crisis they are facing now is beyond the bearing capacity of the government. Most of the farmers have decided to leave the sector and look for some other jobs that provide them a promising remuneration.

PART III

WHAT THE GOVERNMENT CAN DO

As of now the government has only taken minimal steps to aid the farmers and most of these policies weren't concrete enough to have a notable effect on them. The Government should take more decisive steps to support the farmers otherwise there will be a deep - rooted agrarian crisis, which will affect the overall development of the Indian economy. The authorities should implement policies at a micro level to revive each and every farmer in the country, in a uniform manner from the grass root level. And the authorities should give more emphasis to the policies that will enable the farmers to be economically stable. Transferring cash directly to their account will boost their purchasing power thus helping them to meet their daily needs in a smoother manner. Direct cash transfers are an efficient way to revive the existing aggregate demand deficit of the economy.

The authorities should either write off the loans taken by the farmer or bare a portion of the loss incurred by them due to lower price for their yields. And providing interest free loans will help them to be economically stable. Currently the agriculture sector is facing a huge labor shortage due to the large scale reverse migration of the migrant workers to their homeland and if the labor deficit continues to prevail for a long period of time it will definitely hamper the growth and productivity of the agriculture sector. So, to avoid such a situation the government should enable easy movement of migrant workers across the country with minimal restrictions, thus it will kick start the working of the agriculture sector as well as many other frozen sectors of the economy. Farmers are striving hard to pay the rent for the lease land taken for agriculture purpose and most of them are not able to pay the rent due to cash crunch, which is a result of pending dues from the buyers and lower price for the agriculture products in the market. To compact the situation government should request the landlords to give adequate time to the farmers to pay back the rent rather than forcing them. Government should take steps to recover the pending dues of the farmers from their buyers at the earliest, because cash blockages have thrown many farmers into debt trap.

Many farmers don't have enough capital to carry out the agricultural activities in the upcoming years. So, the government should provide financial support to the farmers to purchase seeds, fertilizers and other farm inputs for the next sowing season. Restart the disrupted supply chains fully and efficiently and increase the government spending in constructing more warehouses, cold storage and other infrastructures to boost the agricultural productivity in the country. Added to this increased public investment will create more employment thus it leads to income generation and restart the functioning of the economy. FAO should procure yields from the farmers at a remunerative price and supply it through the PDS system. This step will ensure food security in the country as well as provide a promising income to the farmers. Give farmers some concessions in electricity and water bills which will reduce their expenditure, improve their purchasing power and enable them to come back to normal. Provide free ration to the farmers irrespective of being a ration card holder on a regular basis until the economy comes back to normalcy.

SUSTAINABLE DEVLEPMENT POLICIES TO REVIVE THE SECTOR

INFRASTRUCTURE DEVELOPMENT

Despite being one of the most prominent agricultural producers in the world and an important exporter of agriculture commodities, India still suffers from poor infrastructural development in the agriculture sector. Infrastructure plays a crucial role in agriculture productivity. Investment in physical infrastructure – irrigation, energy, telecommunication, and transportation is essential to facilitate integration of rural areas into national and international economies. Infrastructural investment leads to reduced costs per output, increase farmer's access to markets, enhances productivity and improves farmer's income. It has other positive externalities such as development of rural areas, alleviating hunger and poverty and proper conservation and management of natural resources. Properly

functioning transportation facilities will reduce the cost of transportation thus improving the profit margin of both the farmers and traders. Better highways, railways, and port infrastructure will impact agricultural productivity positively. India has the largest spoilage rate in the world, which is mainly due to insufficient warehouse and cold storage facilities. Proper storage facilities will enable post harvesting management of perishables as it increases the shelf life and storability of products. Digitalization of rural areas will open new horizons to the agricultural sector. Digitalization will enable farmers to get timely weather updates, information about new farming techniques and other related information's. The majority of Indian farmers (55 per cent) still depend on rainwater for irrigation. Indian monsoons are erratic, which results in huge losses for the farmers. Investment in irrigation will definitely improve the agricultural productivity and farmer's income. New regulation or changes to regulation of infrastructure should focus on an appropriate balance between public and private cooperation, and provide incentives for private infrastructure owners to continue to build and improve upon infrastructure needed by the market

CAPITAL INTENSIVE FARMING

Agriculture sector is facing a huge labor shortage due to which the productivity is considerably reducing. Adoption of more capital intensive or machine intensive farming practices will solve the problem of labor shortage and will definitely improve the productivity. To encourage capital intensive farming practices among the farmers the government should provide certain subsidies or concessions in tax, electricity and water bills to the farmers who are adopting such techniques. Thus it will be an incentive for the rest of the farmers to take up such advancements. The government should provide proper guidance to the farmers in using such technologies with maximum capacity utilization.

CONTRACT FARMING

Government agencies should provide tender to the farmers in producing agricultural products and they should procure the products at a minimum support price. The produce can be further distributed through the PDS system. The government should provide land, fertilizers, seeds and other farm inputs and they should also suggest innovative farming techniques to farmers. This scheme should be mainly extended to the landless farmers, thus enabling these landless farmers to have a guaranteed income.

MORE RESEARCH AND DEVELOPMENT IN AGRICULTURAL SECTOR

India currently spends just 0.30 per cent of agriculture GDP on agricultural research, and when compared with other developed and developing countries the GDP contribution of India towards agricultural research is very low. Spending on agriculture R&D would lead to sustainable development with comparatively more equal distribution of resources. So increasing R&D spending on agriculture is not only a vital necessity for ensuring food security, but also important from the socio-economic point of view. India should increase its R&D spending by more than 3 per cent to regain the lost glory of agricultural sector in the economy. Currently India has the largest research system (National Agriculture

Research System) in the world with 27,500 scientists and more then 1,00,000 supporting staff actively engaged in agricultural sector. In spite of a large agriculture research network, the system failed to respond to the biggest problems of Indian agriculture ranging from cost efficient farming practices to capacity utilization of the existing agricultural resources of the country. The government should encourage private investment in agriculture R&D to boost the performance of the sector.

PART 1V

IMPLICATIONS

Farmers initiated many steps to deal the crisis but there wasn't any proper support from the government at the initial stages to help out these farmers from this situation. Harvesting process was affected due to the lockdown - induced labor shortage and to deal this situation the harvesting process was collectively done by farmer's cooperatives and other organizations. Farmers formed themselves into cooperatives from respective panchayats, where the farmers directly took part in the harvesting process and each farmer was paid a remuneration of 100 rupees or more per hour. Many organizations and NGO's also actively took part in the harvesting process and helped the farmers in transporting the produce to the final market. Even through the market price of the agricultural products were very low the farmers were willing to sell the produce at that lower price to avoid spoilage. So the farmers supplied the products directly to the final consumer without the involvement of any middlemen to avoid the middlemen commission. As the result farmers were able to acquire the full market price of the yield even though the market value was really low.

The government also undertook steps to help out the farmers from the crisis but those policies weren't sufficient enough to have a lasting impact on them. Government of Kerala made harvesting an essential service so that harvesting is not disturbed due to the lockdown restrictions and allowed the passage of small trucks to carry agriculture products to the final market to avoid the spoilage rates. The most important one was the moratorium of six months declared by the government on the loans taken from the formal sector. Moratorium period effectively allowed the farmers to postpone repayment of liabilities and help in planning their finances in a better manner. Kerala government's flagship program Subhiksha Keralam aims to combat food scarcity in the post lockdown era. The project was launched in June 2020, encompasses departments such as Animal Husbandry, Diary Development, Horticulture and Fisheries. NABARD[xiii] has earmarked Rs 2,500 crore for the project which aims at attaining self-reliance in food production within the next five years. Workers of the MGNAREGA, Kudumbashree volunteers, cooperative banks, NGO's, farmers' organizations, youngsters and repatriation NRK's[xiv] are part of the program. The Agriculture Department provides quality seeds and saplings to those interested in farming. The agriculture department is planning to implement various action plans with public participation in order to achieve self – sufficiency in food production in the state. Through the Subhiksha Keralam project the government of Kerala aims to convert the state from a consumer state to a producer state of agriculture

products. The project aims at a large scale production of paddy, fruits, vegetables, tubers, grains and legumes. Initially 25,000 hectares of barren land has been converted into farming land. Authorities are also trying to create good models of integrated farming so that expenditure is reduced and income is increased. With more technology and people involved in the process, the farmers will be educated about alternate farming methods like micro-farming, zero-budget natural farming and other methods. Under this scheme, over 150 tribal families in Kerala's munnar region has taken up farming in a large scale with the help of panchayat and the agriculture department to become self – reliant amid the pandemic. The community is mainly doing maize and vegetable farming on the allotted land.

Unlike the other sectors the commodities produced in the agriculture sector was not allowed to trade across the country freely. The farmers did not have access to the markets across the country and their trade was restricted within the state or the nearby mandis. The Farmers' Produce Trade and Commerce (Promotion and Facilitation) Ordinance, 2020 was promulgated on June 5, 2020. It seeks to provide for a barrier-free trade of farmers' produce outside the markets notified under the various state agricultural produce market laws (state APMC Acts). The Ordinance will prevail over state APMC Acts. The Ordinance allows intra-state and inter-state trade of farmers' produce outside: (i) the physical premises of market yards run by market committees formed under the state APMC Acts and (ii) other markets notified under the state APMC acts such as private market yards and market sub-yards, direct marketing collection centers, and private farmer-consumer market yards. A person transacting with a farmer will be required to make payments to the farmer on the same day, or within three working days in certain conditions, for any transaction of scheduled farmers' produce. The Ordinance prohibits state government from levying any market fee, cess or levy on farmers, traders, and electronic trading platforms for any trade under the ordinance. In order to make farming sector and farmers self-reliant the central government launched a financing facility of Rs 1 lakh crore under the Agriculture Infrastructure Fund for agri-entrepreneurs, startups, agri-tech players and farmer groups for post-harvest management and nurturing farm assets. In ten year duration till 2029, the initiative aims to provide medium-to-long term debt financing facility for investment in viable projects for post-harvest management infrastructure and community farming assets through interest subvention and financial support. Under the fund, about 3 per cent interest subvention and credit guarantee of up to Rs 2 crore will be provided to the beneficiaries to increase the viability of the projects. Credit guarantee coverage will be available for eligible borrowers from this financing facility under the CGTMSE[xv] scheme for a loan of up to Rs 2 crore. The fee for this coverage will be paid by the government. The funds will be provided for setting up of cold stores and chains, warehousing, silos, assaying, grading and packaging units, e-marketing points linked to e-trading platforms and ripening chambers, besides PPP[xvi] projects for crop aggregation sponsored by central/state/local bodies. Under Pradhan Mantri Kisan Samman Nidhi (PM-KISAN) Rs. 17,986 crore was transferred to the bank accounts of the farmers.

COVID – 19 has exposed the cruelest face of the era, the unemployment rates in the country are rising at an alarming rate. According to the Center for Monitoring the Indian Economy has estimated it to be as high as 23.5 per cent in May. The monthly demand for rural job under the MGNAREGA scheme has crossed 4 crore at the end of May, which is the highest in the last 5 years. A rise in MGNAREGA work demand in the month of May indicates the rampant job

loss in the country, particularly in the informal sector, where lakhs of workers have suddenly became unemployed owing to the lockdown. Majority of the workforce in the agriculture sector are migrant workers and owing to lockdown there was a large scale reverse migration of workers to their homeland. In their homeland workers had no jobs hence they are seeking job under this scheme. Government schemes such as MGNAREGA which is supposed to guarantee 100 days of work is not providing guaranteed working days as well as there is a delayed distribution of wages to the workers. As compared to the government welfare schemes migration has a direct bearing on uplifting the migrants and their families out of poverty. Female agricultural workers from rural Bihar can double their income by migrating to Patna and male agricultural workers can increase their income 66 per cent by moving to Punjab and to still higher by moving to major cities like Ahmedabad, Surat, Delhi, or Mumbai. Currently the reverse migrant workers employed under this scheme are earning less than what they earned through migration and most of them are not able to find jobs due to lack of job opportunities in their homeland. Welfare programs such as distribution of free food grains to the people belonging to the BPL category in wake of COVID – 19, through the public distribution system is not equitably accessible to all belonging to that category. Most of the families do not have access to PDS supplies as they did not have a ration card and in some places there wasn't proper distribution of the supplies to the recipient. Unavailability of jobs, lower wages under the government schemes and ineffective distribution of food grains through the PDS has pushed these workers to poverty, food insecurity, starvation and debt traps.

CONCLUSION

Agriculture sector plays a vital role in ensuring food security in the country. COVID – 19 and its subsequent lockdowns has completely ruined the agriculture sector of India. The pandemic – induced lockdown led to the reduction of farmers income, disruption of the supply chains, forced the farmers to sell their products at a throw away prices and thus pushing many famers into a debt trap and poverty. The pandemic has a direct bearing on the socio – economic configuration of the farming community, thus making it difficult for them to meet their daily needs. Most of the farmers have decided to move to other sector owing to the uncertainty prevailing in the agriculture sector. Government and its authorities need to take legitimate decisions and act with prudence otherwise the situation will compound to an agrarian crisis. Most importantly, the government should increase direct cash transfer to the bank accounts of the respective farmers which will directly address the prevailing issues such as deficit demand and deflationary trends in the economy. Apart from the pandemic – induced policies to revive the sector from the ongoing crisis, the government should adopt a series of sustainable development policies to achieve a holistic growth in the sector and further upgrade the agriculture sector to an international standard. India can achieve food security and combat malnutrition effectively if more prominence is given in upgrading the agriculture sector in a sustainable manner.

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[i] Research and Development
[ii] Gross Value Added
[iii] Food and Agriculture Organization
[iv] Agriculture Produce Market Committee
[v] Market place for food and agriculture commodities
[vi] South Asian Association for Regional Cooperation is a regional intergovernmental organization and geopolitical union of states in South Asia. Its member states are Afghanistan, Bangladesh, Bhutan, India, The Maldives, Nepal, Pakistan and Sri Lanka
[vii] Mahatma Gandhi National Rural Employment Guarantee Act, 2005
[viii] National Crime Records Bureau
[ix] Gross State Value Added
[x] (India G. o., 2018)
[xi] Compound Annual Growth Rate
[xii] (India G. o., March 2020)
[xiii] National Bank for Agriculture and Rural Development
[xiv] Non Resident Keralites
[xv] Credit Guarantee Fund Trust for Micro and Small Enterprise
[xvi] Public Private Partnership