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RESEARCH ARTICLE

ENRICHMENT OF SOCIO-ECONOMIC CONDITIONS OF THE FARMERS THROUGH AGRICULTURAL DEVELOPMENT UNDER AMRIT KAAL

***Dr. Arunachalam, P.**

Fellow, Indian Institute of Advanced Study, Rastrapati Nivas, Shimla 171005

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***Corresponding author:**
Dr. Arunachalam, P.

ABSTRACT

One of the Four core chronicle problems faced by India right from India's independence identified by the present government is socio economic development of farmers. Other three chronicle problems are poverty, youth development/skill development among youth and socio economic emowermet of women. Without farmers development India can not claim the status of Viksit Bharat@2047. Thugh India made green revolution in the fourth five year plan itself, the farmers are not the beneficiaries of agriculture development. Two thirds of the profit is taken over by the middle men. Lack of storage facilies, lack of institutional financial facilities for tenents, lack of marketing facilities both within and outside India, lack of transport facilities about thirty per cent of the vegitables and fruits are wasted in India. So the present government wanted to put an end to this problem and decided to ensure a fair price for agricultural products and bring the farmers from the vicious circle of poverty and discomfort. The farmers constitute about 44 per cent of the 1447 million. It is not a small per centage. If the economic conditions of these farmers improved it will solve poverty, women empowerment, lage scale migration of the youngsters and youth development. This paper discussed all these issues with the intention of making policies to uplift the farmers.

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INTRODUCTION

Right from India's independence we keep on telling that agriculture sector is the backbone of Indian economy. Gandhi once stated that India lives in villages. This is the only sector has this credit and distinction even before and after independence of India because this sector provides employment opportunities, including disguised employment, to about 44 per cent of 1427 million people, nearly half of India's total population, who are directly involved with this sector. Agriculture accounts for about 18% of the GDP but employs more than 44% of India's total work force in the unorganised sector. The National Democratic Alliance government, after it assumed office in 2014, promised to double farmers' incomes by 2022 itself. Situation Assessment Survey (SAS) (Situation Assessment of Agricultural Households and Land and Livestock Holdings of Households in Rural India, 2019 (January – December, 2019)revealed that farming continues to be crisis ridden and is increasingly becoming a marginal occupation for farmers. India was an agricultural based economy before the British came to India, India remained an agricultural economy during the 195 years British rule. After independence and before implementation of the Liberalisation, Privatisation and Globalisation (LPG) policy period also agriculture was the main stay of the people. Even after 34 years under LPG programme, India is continue to provide livelihood for about 44 per cent of the population. But most of them at subsistence level only. Agricultural sector is not a profitable one. About 85 per cent of them are small and marginal holders doing farm activities without getting proper credit facilities and mainly depend on money lenders for meeting their credit facilities with high rate of interest. Before independence when India was exporting only agricultural based traditions products like tea, coffee, jute, cotton, oil cakes, and spice items India's share in the international trade was about 2.4 per cent. Even after 78 year of independence, implementation of 12 Five Year Plans as well as 34 years of Liberalisation, Privatisation and Globalisation (LPG) policies India is not able to catch that level of share in the international trade. It is just now reached the pre-independence level of 2.4 per cent in 2023-24. According to the Census 2011 about 68.88 per cent of the India's total population living in rural areas. According to the World Bank Report 2025, in China about 22.33 per cent of the people involved in the agricultural sector, in European countries and USA less than 5 per cent of the people only engaged in the agricultural sector. Similarly the agricultural sector contribution to their GDP is also more or less less than 5 per cent only. But in India more people depend on agriculture for their livelihood but the contribution of agriculture is only 18 per cent. In western countries though very less per cent of people involved in the agricultural sector still they produce more than what is required for their countries and also exporting to other countries against the principle of 'Factor Endowment Theory' of Hecsher-Ohlin and take away a large share of agricultural trade at international level. Advanced Countries like United States, China and Russia are the major producer of agricultural products and also playing a major role agricultural exports. USA is the top exporter of agricultural products with $178.7 billion in exports as of 2023. If one looked into the growth of agricultural sector from 1950 onwards, agricultural sector contributed about 55 per cent of India's GDP in the year 1950s and at the same time nearly 65-70 per cent of the total population also directly engaged with this sector. Though the

contribution of the agricultural sector to India's GDP is keep on reducing year after year to the level of 18 per cent during 2023-24, the per cent of people engaged with this sector is not being reduced as expected level. When we say agricultural sector is the backbone of our economy its growth rate is not quite impressive and to a large extent it is almost stagnant with about 2 per cent growth rate level for the past one decade although successive governments fixed a target of achieving 4 per cent growth rate during the annual budget presentation every time. Its growth rate was, on an average, about 3.6 per cent during the period from 1985-86 to 1995-96 and 1.9 per cent during the period from 1995-96 to 2005-06. With large number of population, less growth rate, and less contribution to GDP, agricultural sector is considered as a sick and unorganised sector in India. India was a foodgrains import country at the time of independence. At the time of India's independence, the country was a net importer of food grains from the British colonies. This is primarily due to a combination of factors like importance given to cotton and jute cultivation, outdated agricultural practices, dependence on monsoon, not much importance was given to constructing dams and irrigation facilities, farm lands were used for producing raw materials for the cotton mills in England and limited rural infrastructural facilities. The Foodgrains Policy Commission 1947 recommended the need for continued imports of foodgrains to maintain central stocks and address potential crop failure which was quite common in those days. India became a food Deficit Country to food surplus country only when "green revolution took place in India in 1967". Government of India gave primary importance to agricultural sector in the First Five Year Plan since 52 per cent of the 340 million people lived even without single time food. The partition of India also one of the reasons for food deficit at the time of Independence. Two major foodgrains production agricultural lands like West Punjab and East Bengal gone with Pakistan. The first plan aimed to increase food production, improve land operations, expand irrigation, and encourage the use of fertilizers and improved seeds. This strong support and encouragements continued through out First Five Year Plan to Fourth Five Year Plan. It resulted in attaining green revolution through soil management, adopting High Yielding Verities of Seeds, pesticides, application of non-traditional fertilizers, increasing irrigation facilities by constructing more dams and introduction of bore well irrigation systems in the dry areas.

Along with agricultural development the socio-economic development of the farmers, rural development programmes also received a prominent attention from the government through out Five Year Plans. Programms like Garibi Hatao in 1971 and 20 point programmes, etc.The major features of most of the schemes are –"(1) privatisation of agriculture and price protection of produce, (2) land leasing and contract farming by private companies, (3) raising the ceiling of land holdings, (4) involving national livestock breeding strategy to meet requirement of milk, meat, egg and livestock products. (5) protection of plant varieties and improvement of horticultural crops, live-stock species and agriculture. (6) liberalization of domestic market by dismantling of restriction on movement of commodities in the country. (7) improving the domestic and international marketing system. (8) facilitating the flow of credit to farmers against pledging of their products and providing them most other facilities available to manufacturing sector. (9) keeping agriculture outside the regulatory and tax collection system. (10) encouraging consolidation of land holdings and speeding up tenancy re-forms to recognize the right of the tenants and sharecroppers It may be noted that the policy are intentions of Government, thus, its success depends on the commitment of the Government to convert it into reality". The strength and vitality of a nation's farmers, often referred to as 'Annadatas', is closely linked to the overall empowerment and prosperity of the country. The sincere efforts of the Government of India to uplift this crucial segment of society warrant commendation and recognition. In a rapidly advancing economy like India, nurturing the agricultural sector holds equal importance alongside the transformation of industries and digital infrastructure. Today, farmers across the nation are experiencing a newfound sense of economic security and assurance. 1. Showing the government's farmer-centric focus, the budget set aside for agriculture increased 5 times from ₹1.37 lakh crore during 2007-14 to ₹7.27 lakh crore during 2014-25. 2. Pradhan Mantri Fasal Bima Yojana (PMFBY) has become the largest crop insurance scheme in the world in terms of farmer enrolments as well as the third largest scheme in the world in terms of insurance premiums.3. Infrastructure near the farms is key to farmers' welfare. Since the inception of the Agriculture Infrastructure Fund, Rs 35,262 Crores have been sanctioned for 48,352 projects. Major projects sanctioned under AIF include 11,165 warehouses, 10,307 primary processing units, 10,948 custom hiring centers, 2,420 sorting & grading units, 1,486 cold store projects, 169 assaying units and around 11,857 other kinds of post-harvest management projects and community farming assets. 4. A historic MSP increase was announced where, for the first time, the minimum support price of all 22 crops was set at a minimum 50% more than the cost. 5. Soil health cards provide farmers with the nutrient status of their soil and its composition. Till December 19, 2023, 23.58 crore soil health cards have been distributed to farmers. 6. The introduction of 100% neem coated urea. In the last 10 years, urea production has risen to 310 lakh metric tonnes from 225 lakh metric tonnes in 2014. 7. Paramparagat Krishi Vikas Yojana launched - Total fund released Rs 1980.88 Cr since 2015-16 (as on 31.01.2024). Under the scheme 37,364 clusters (20 ha each) have been formed, 8.13 lakh ha area covered (including LAC) and 16.19 lakh farmers have benefitted. 8. Promotion of FPOs - As of January 31, 2024, 7,950 FPOs have been registered. Equity Grant of Rs 142.6 Crore has been released to 3,183 FPOs. Credit Guarantee Cover worth Rs 246.0 Crore issued to 1,101 FPOs. 9. Agricultural mechanization - During the period from 2014-15 to December, 2023 an amount of Rs 6405.55 crore has been allocated for agricultural mechanization. From within the funds of Sub-Mission on Agricultural Mechanization (SMAM), so far an amount of Rs 141.41 crores have been released towards Kisan drone promotion, which includes purchase of 317 Drones for their demonstration in 79070 hectares of land and supply of 527 drones to the farmers on subsidy. 10. As of January 31, 2024, 1.77 crore farmers and 2.53 Lakh traders have been registered on e-NAM portal. 11. Introduction of Kisan Rail - Till 28th February 2023, 2359 services on 167 routes have been operated. 12. The policy initiatives, such as Pradhan Mantri Kisan Maandhan Yojana (PM-KMY), Pradhan Mantri Kisan Samman Nidhi (PM-KISAN), and Pradhan Mantri Fasal Bima Yojana (PMFBY), have been instrumental in offering financial and income assistance to farmers. The Government has given priority to over 10 crore small farmers in the country's agricultural policy and schemes (pib.gov.in, 2024).

The NDA Government under PM Narendra Modi has put unprecedented focus on agriculture. Numerous initiatives to improve productivity, safeguard farmers and augment their incomes and improve their overall well-being have been taken.PM Narendra Modi's government has set a goal of doubling farm incomes by 2022 and is working with multi-modal focus towards achieving the same. From seeds and soil to access to markets, the focus has been on reforms across the agricultural cycle. There is also a renewed focus on allied activities, to aid incomes of farmers.To begin with, there is the record budgetary allocation for agriculture and farmer welfare under the NDA government. Compared to the previous government tenure of 2009 to 2014 which saw an allocation of Rs 1,21,082 crore, PM Narendra Modi's government has allocated Rs 2,11,694 crore in the period 2014-19. This is almost double.

Helping farmers during production: To ensure that the farmer reaps good yields, focus on strengthening sowing-related activities is imperative. The government has taken various steps in this regard.Considering that the health of the soil plays a fundamental role in agriculture, the government has dispatched more than 13 crore soil health cards from 2015 to 2018. Soil Health Cards carry crop-specific recommendations for nutrients and fertilizers to help farmers improve their productivity.There are hardly any complaints from the states with regard to fertilizer distribution. The reason being the significant increase in the Urea production as the government has revived the defunct fertilizer plants and also set up new plants. Since the government has implemented 100% neem coating of Urea, it not only resulted in improving the soil quality but also prevented the diversion

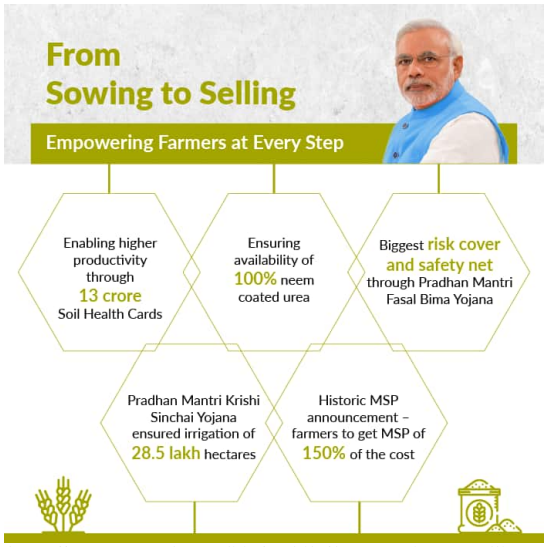
of fertilizers to other purposes. There is a special arrangement of Rs 10,000 crore to clear fertilizer subsidy due.Pradhan Mantri Krishi Sinchai Yojana is in place to ensure 'more crop per drop' which will cover 28.5 lakh hectare area under irrigation. Rs 50,000 crore earmarked for ensuring that every farm gets water. Rs 5,000 crore fund for micro-irrigation made available while there has been an encouragement for farmers to install solar pumps for irrigation.

Credit for farmers: The Modi Government has taken important policy initiatives to address the issue of farm credit and save farmers from being exploited in the hands of informal credit sources such as moneylenders. Pradhan Mantri Fasal Bima Yojana is the biggest risk cover and safety net provided by the government. Under interest subvention scheme short-term crop loans up to 3 lakh with the interest rate of 7% per annum up to one year made available.

Marketing the farmers produce: The government's policy follows the next logical step after supporting the farmer at sowing time, which is to help farmers to get right price for their produce. In July 2018, government approved the historic MSP hike for Kharif crops to 1.5 times the cost, which will provide farmers a profit margin of 50% over the cost of production. National Agriculture Market scheme known as e-NAM has integrated 585 markets across 16 states and 2 Union territories. More than 164.53 lakh tonnes of farm commodities have been transacted on e-NAM and more than 87 lakh farmers have been registered. Thus, it is cutting down the middlemen in agriculture trading to facilitate farmer with his due. 22,000 rural haats will turn into Gramin Agriculture Market which will benefit 86% small farmers. Large investment in warehousing and cold chains to prevent post-harvest crop losses and value addition through food processing also giving the farmers the essential edge on the market. To address the price volatility of perishable items like tomato, potato and onion 'Operation Greens' has been put in place.

Focus on allied sectors: As noted earlier, the focus has been laid on allied agriculture activities to boost farmers income. Corpus of Rs 10,000 crore set up to create infrastructure in fisheries, aquaculture and animal husbandry. Integrated Development & Management of Fisheries with an outlay of Rs 3000 crore, the establishment of 20 Gokul Grams are some of the examples in this regard.

Growth in production: There are ample indications to suggest that PM Narendra Modi's agriculture policy implementation has been yielding results. Agriculture production has touched a new high in 2017-18 with 279.51 million tonnes of food grain production. The extent of the buffer stock of pulses increased from 1.5 lakh tonnes to 20 lakh tonnes. Milk production has increased by 18.81% in 2016-17 as compared to 2013-14. True to the spirit of PM Narendra Modi'smotto- Beej se le ke Bazaar tak- government has been pursuing a holistic approach in agriculture and the positive results have started shining on the ground. **(**narendramodi.in)



Source: https://www.narendramodi.in/mobile/from-sowing-to-selling-produce-modi-government-s-initiatives-empowering-farmers-at-every-step

The Prime Minister highlighted about the transaction Rs. 18,000 Crores directly in the bank accounts of more than 9 Crores farmers' families in the country at the click of a button today. He added ever since this scheme started, more than Rs. 1 Lakh 10 Thousand Crores have reached the accounts of farmers. The Prime Minister said the Government worked at aiming to reduce the input cost of the farmers. He listed some farmer-centric initiatives of the Government like Soil Health Cards, Neem Coating of Urea, Schemes for distribution of Solar Pumps which helped in reducing the input cost for the farmers. He added the government tried to ensure that the farmers have a better crop insurance cover. Today, crores of farmers are getting the benefit of the PM crop Insurance Scheme. The Prime Minister said the government tried to ensure that the country's farmers get a fair price for the crop. He said the Government fixed one and a half times the production cost as MSP for the farmers as per the recommendations of the long-standing Swaminathan Committee report. He added the number of crops for which MSP is available were also increased. The Prime Minister said that the Government aimed to open new markets for the farmers to sell their crop. He said the Government added more than a thousand agricultural mandis of the country online. Among these, more than Rs. 1 Lakh Crore have been traded. He said the Government worked towards forming groups of small farmers so that they can work as a collective force in their region. Today, a campaign is underway to form more than 10,000 Farmers' Producers' Organizations - FPOs in the country, they are being given financial help. The Prime Minister said through these agricultural reforms better options were provided to the farmers. After these laws farmers can sell their produce to whomever they want. They can sell their produce wherever they get the right price. He said after the new laws, farmers can sell their produce at MSP or sell it at market or export or sell it to the merchant, or sell it in another state, or sell it through FPO or be part of the value chain of biscuits, chips, jam, other consumer products. The Prime Minister said now the time has come for Brand India to establish itself in the agricultural markets of the world with equal prestige (icar.org.in/node/1149, 2025).

The modernization of agricultural technology, augment productivity, efficiency and crop diversification, and generate income and employment through a paradigm shift that ensures food security while maximizing value addition in agriculture are the need of the hour at present. The difference between the contribution of agriculture to national income and share in employment has remained large and has widened. The manufacturing and service sectors have failed to absorb the excessive workforce in agriculture. Consequently, value addition per worker in agriculture grew slowly and income per farmer never crossed one-third of the income of a non-agriculture worker since the 1980s. The country took 22 years to double farmers' income at an annual growth rate of 3.31 per cent during 1993-1994 to 2015-16; doubling farmers' income between 2015-16 and 2022-23 will require an annual growth rate of 10.4 per cent in farmers' real income. Corporate investment in agricultural infrastructure has not exceeded 2 per cent. In the year's post- independence, the policy structure was purposeful on increased production and productivity to ensure food security for India. August 15, 2022, independent India will turn 75 years. In the lifespan of nations, India is still young. The best is surely yet to come. India's youthful and aspiration population deserves a rapid transformation of the economy, which can deliver double-digit growth, jobs and prosperity to all. Astrong foundation has been laid in the last four years. While there is every room for confidence, there is none for complacency. A surge of energy, tireless effort and an unshakeable resolve on the part of the government, private sector and every individual citizen can achieve this transformation in the next five years. The current government has taken several steps to improve private investment in agriculture. 100 per cent foreign direct investment (FDI) was allowed in 2016-17. Similarly, the SAMPADA scheme targets creation of food processing infrastructure.Model Contract Farming Act, new guidelines for agro-forestry are some other key policy initiatives taken over the past few years. Constraints with agricultural sector in general are: 1. Fragmented land holdings: Agriculture is characterised by an extremely fragmented landholding structure with an average farm size of 1.15 hectares and the predominance of small and marginal farmers, with those holding less

than 2 hectares, 2. Low price realization There exists a large gap between farm harvest prices (FHP) and retail prices. Prices also tend to fall below the minimum support prices in a good production year, leading to agrarian distress. Mechanisms need to be developed to Non-farm employment ensure remunerative prices to farmers, in both 'good' and 'bad' monsoon years. 3. Lack of non-farm employment opportunities has resulted in excessive dependence on agriculture for livelihood among both small and marginal farmers as well as among the landless. 4. Agricultural credit Despite an allocation of more than INR 11 lakh crore of commercial credit, access to institutional credit remains a constraint, especially in the case of tenant farmers. 5. Agricultural trade Exporters of agro-commodities are not successful in raising their share in global markets because of uncertainty in the foreign trading regime. (Jayaprada Sahoo, and Suresh Vadranam, 2024). The Modi government has started off the New Year with a lot of goodwill gestures to Indian farmers and rural households. How transformative are these measures?The easiest to assess is the impact of the extension of existing schemes. The coverage of farmers under PMFBY has been consistently on the rise during the major crop season, the Kharif season, from 16.87 million farmers in 2020 to 25.94 million in 2024. The PMFBY applications for the Kharif season increased from 40.96 million in 2020 to 97.1 million in 2024. The area insured under PMFBY during Kharif increased from 27.2 million hectares in 2020 to 33.3 million hectares in 2024. The acceptance of RWBCIS was also similar. The number of applications under this crop insurance scheme went up from 0.3 million in 2020 to 1.65 in 2024. The area under coverage increased from 0.2 million hectares in 2020 to 0.9 million in 2024. On the face of it, the continuation of the schemes looks good.The second decision, the extension of additional DAP subsidy, is meant to cushion the cost of this fertiliser to the farmer. Since 2010, the NBS scheme has been operational. At the moment, 28 grades of P&K fertilisers are made available to farmers at subsidised prices through fertiliser manufacturers/importers under this scheme. In July 2024, the government approved a one-time special package on DAP beyond the NBS subsidy @ ₹3,500 per MT from 01.04.2024 to 31.12.2024 with an approximate financial implication of ₹2,625 crore. On January 1, the Cabinet extended this DAP package with approximate financial implications up to ₹3,850 crore. While the move will help farmers access DAP at a reduced price through this measure, not all farmer bodies consider this as a great measure. In fact, in a statement on January 2, All India Kisan Sabha (AIKS) said the surge in fertiliser price was primarily due to import dependency, monopolistic practices of global suppliers and depreciation of the Indian rupee – all matters that need to be tackled by the government. "AIKS views the cabinet decision to extend special subsidy on di-ammonium phosphate DAP as facilitating corporate profit rather than protecting farmers' interests. The fertiliser subsidy has been slashed substantially in the last three years to the tune of an accumulated sum of ₹87,339 crore. In the Union Budget 2022-23 (actuals) the fertiliser subsidy was ₹2,51,339 crore and in the Budget 2023-24 (Revised) the expenditure made was only ₹1,88,894 crore which was less by ₹62,445 crore. As per the 2024-25 Budget estimate, the fertiliser subsidy is ₹1,64,000 crore means further less by ₹24,894 crore (Joe Mathew, 2025).

India's agriculture sector has been witnessing robust growth, with an average annual growth rate of 4.6 per cent over the last six years. This has enabled the agriculture and allied activities sector to contribute significantly towards the country's overall growth, development and food security. Further, in recent years, the country has emerged as the net exporter of agricultural products, with exports in 2021-22 touching a record US $ 50.2 billion. Recently, in the Union Budget, Government announced that an 'Agriculture Accelerator Fund' would be set up to encourage Agri start-ups founded by young entrepreneurs in the rural area. Additionally, the Government also announced that the agricultural credit target would be increased to Rs 20 lakh crores with a focus on animal husbandry, dairy and fisheries. Through these targeted initiatives, Government aims to increase farmers' income further, focusing on boosting high-value crops and allied sub-sectors. Continued focus on providing support, building proper physical infrastructure, steps to build digital Agri infrastructure, boost to Agri-tech ecosystem can further enhance agriculture in India and increase the value added from the sector. Due to these initiatives undertaken in the agriculture sector, the contribution of agriculture to GDP in the country is expected to increase from 20 per cent to 22 per cent. The agricultural sector in India holds the record for the second-largest agricultural land. Over the years, agriculture in India has undergone significant transformation and several game changers have emerged in the Indian agriculture ecosystem that has contributed to the growth and development of the sector. (Deepak Jain, 2023) Emphasizing 'Agriculture as the first engine' for India's development journey, Union Budget 2025-26 announced a slew of measures to spur Agricultural Growth and Productivity, thereby benefitting the Annadata**.**Announcing the Government's decision to establish a Makhana Board in Bihar**,** toimprove production, processing, value addition, and marketing of makhana as well as support the people engaged in these activities to be organized into Farmer Producer Organizations (FPOs). The Board will provide handholding and training support to makhana farmers and also work to ensure they receive the benefits of all relevant Government schemes. Another important scheme is National Mission on High Yielding Seeds is with an aim to strengthen the research ecosystem, targeted development and propagation of seeds with high yield, pest resistance and climate resilience, and commercial availability of more than 100 seed varieties released since July 2024.To provide conservation support to both public and private sectors for genetic resources and ensure future food and nutritional security, the Minister said that the second Gene Bank with 10 lakh germplasm lines will be set up.Announcing the 'Mission for Cotton Productivity'**,** that the five-year mission will facilitate significant improvements in productivity and sustainability of cotton farming, and promote extra-long staple cotton varieties**.** The mission would benefit lakhs of cotton growing farmers as the best of science & technology support will be provided to farmers. Aligned with the Government's integrated 5F vision for the textile sector, that the mission will help in increasing incomes of the farmers as well as ensure a steady supply of quality cotton for rejuvenating India's traditional textile sector.Noting the importance of Kisan Credit Cards (KCC) in facilitating short term loans for around 7.7 crore farmers, fishermen, and dairy farmers**,** the government announced the enhancement of loan limit under the Modified Interest Subvention Scheme from Rs. 3 lakh to Rs. 5 lakh for loans taken through the KCC.The Budget also announced the setting up of Urea plant with annual capacity of 12.7 lakh metric tons at Namrup, Assam.

This will further augment urea supply and help to achieve Atmanirbharta in urea production**,** along with the recently reopened three dormant urea plants in the Eastern region.Highlighting that India ranks second-largest globally in fish production and aquaculture with the Seafood exports valued at Rs. 60 thousand crore, it was remarked that the Government will bring in an enabling framework for sustainable harnessing of fisheries from Indian Exclusive Economic Zone and High Seas**,** with a special focus on the Andaman & Nicobar and Lakshadweep Islands, which will unlock the untapped potential of the marine sector (pib.gov.in, 2025). The Average Annual Growth Rates (AAGRs) of overall GDP and agriculture -GDP (2011-12 base, revised series) from 1991-92 to 2023-24 (second advance estimate) of overall GDP is 6.1%, for agri-GDP it is 3.3%. However, during the 10 years of the Modi government, overall GDP has grown only by 5.9% (compared to 6.8% during Manmohan Singh's period) and agriculture growth has been 3.6% (compared to 3.5% during ManmohanSingh's tenure). There is not much of a difference between the two governments with respect to agri-GDP growth. Agriculture is critical for India's development as it still engages about 45.8% of working population (2022-23, PLFS data). So, if Viksit Bharat has to be inclusive Bharat, it must develop agriculture to its full potential. The productivity needs to rise, water consumption needs to reduce, groundwater needs to be recharged, soil degradation needs to be arrested, and greenhouse gas (GHG) emissions from agriculture need to be curtailed. Business as usual, with the current set of policies, is not likely to deliver this dream of inclusive Viksit Bharat by 2047.If our growth rates of overall GDP and agri-GDP keep rising as they have during the last 20 years, or even the last 10 years, it is likely that by 2047, agriculture's share in overall GDP may drop to just 7-8% but

it may still be saddled with more than 30% of the workforce. More people need to move out of agriculture to higher productivity jobs with better skills. Therefore, skill formation of rural people for a rapidly growing and urbanising India has to be a priority. We must rationalise food and fertiliser subsidies, and use the savings to augment agri-R&D, agri-innovation and agri-extension, recharge soil and water through check dams and watersheds, and promote water saving techniques in agriculture (drip and sprinklers, fertigation, protected cultivation, etc.). More importantly, India must move to high-value agriculture (poultry, fishery, dairy, fruits and vegetables) with a value chain approach, from plate to plough—a demand-driven system. For that we need to think of policies and institutions through which our farmers can access pan-India markets, and even export markets on a regular basis, be it through cooperatives or farmer producer organisation (FPOs) on digital commerce platforms (like eNAM or ONDC) or though contract farming with large processors, retailers, and exporters. We should also not forget to step off the brakes on futures trading. The price messenger can't be shot down in Viksit Bharat (Ashok Gulati, 2024).

P K Mishra, Principal Secretary to Prime Minister Narendra Modi, stated that addressing the issue of smallholder agriculture is crucial to achieving the goal of Viksit Bharat (a developed India) by 2047. the issue of smallholder agriculture needs to be addressed in order to realise our goal of a Viksit Bharat or a developed India by 2047. He highlighted the importance of inclusive, equitable, and sustainable economic growth to achieve developed status. Despite recent progress, the agriculture sector has grown at a slower rate, leading to inequitable growth. He noted that, in many Asian countries, agricultural gross domestic product (GDP) has risen in absolute terms, but its share of total GDP has fallen, while the proportion of agricultural workers remains high. This impacts both income distribution and employment. Agriculture's share in GDP has declined from 42 per cent in 1970–71 to 18 per cent in 2023–24, whereas its share in the workforce has reduced from 70 per cent to 46 per cent during the same period. A study indicates that by 2050, the sector's contribution to GDP is projected to decrease to about 7 per cent, while its share in the workforce is expected to decline to about 27 per cent. Mishra emphasised the critical role of agricultural growth in poverty reduction, especially in rural areas. He cited studies suggesting that small farmers may be more productive than large ones, challenging traditional notions of economies of scale (P K Mishra, 2024).

As India braces for 100 years and towards achieving the goal of Viksit Bharat by 2047, experts say agriculture will hold the key to this transformation. They recommend an urgent need for a reorientation of the agriculture sector to transform India's agri-food systems in the coming years. Padma Bhushan Awardee Dr RS Paroda, Founder Chairman of the Trust for Advancement of Agricultural Sciences (TAAS), emphasized India's need to become 'Viksit', aiming for atmanirbharta and adopting a local-to-global perspective as the country approaches its 100th year of independence in 2047. "New India should focus on capturing global markets, enhancing agricultural research for innovations, reducing imports of pulses, oilseeds, and fertilizers, and achieving a 5 trillion-dollar economy by 2027,". They have outlined an agenda that includes increased investment in agricultural R&D, advocating for a doubling of allocations, establishing a robust export-import policy, strengthening public-private partnerships, adopting a farmer-first approach, converting subsidies into incentives for efficient input use, promoting youth as agri-entrepreneurs and input providers, and supporting market reforms. emphasized that reorienting Indian agriculture requires leveraging 'new science for new gains'. This includes embracing agricultural biotechnology, utilizing information and communication technology for knowledge management, actively applying bioinformatics, and progressively guiding farmers towards adopting climate-smart agriculture with precision farming techniques. He added, "India must galvanize political will, mobilize institutional and human resources, and foster effective public-private partnerships to revolutionize our agri-food systems. Additionally, we need to equip our youth with the necessary skills so as to offer private extension services to farmers, play pivotal role as input providers and agri-entrepreneurs, and consider the agricultural sector as a promising and rewarding career path." Currently, India is the largest producer of milk, pulses, jute, and bananas, and the second-largest producer of wheat, rice, fruits, vegetables, and sugarcane. Beyond production, the industry also aims to be among the top five exporters by 2030. To this end, the sector advocates for a robust EXIM policy to increase India's agricultural contribution from 2.5% to 5% of the global total by 2047. Ajai Rana has stated that the new government has a crucial role in steering the sector towards self-reliance, farmers' prosperity, sustainability, and robust innovation through R&D. This includes introducing modern technologies in seeds, crop protection chemicals, crop nutrition products, and biological products, as well as redirecting agricultural subsidies as incentives for crop diversification and cultivating climate-resilient varieties." As the sector looks forward to a future marked by unprecedented growth opportunitie. He highlighted the critical need for increased investment in agricultural research and the establishment of strategic frameworks to support this vision. "To spur innovation, it is vital to increase agricultural research investment from the current 0.61 per cent of agri-GDP to 1%. Identifying and funding high-priority research projects over the next 3-5 years with active participation from both public and private sectors can yield significant advancements. Formulating a National Agricultural Development Council (NADC), modeled after the GST council, can also be highly effective." (agrospectrumindia.com, 2025).

The country has now set the goal of being a Developed Nation i. e Viksit Bharat by 2047. Viksit Bharat is a vision for India to become a developed nation focusing on economic growth, social inclusion and environmental sustainability. The goal of Viksit Bharat is impossible to attain without giving due importance to agriculture. If the dream of Viksit Bharat has to be realized and fulfilled by 2047, agriculture sector has to be developed to its full potential. The Challenges after Independence: The agriculture sector after attaining independence suffered from numerous challenges that include feeding the increasing population, low productivity and stagnation, creating adequate employment opportunities for the surplus labour besides ensuring timely availability of inputs to the farming community. Agriculture sector also suffered because of outdated technology, crude practices and huge dependence on timely rainfall. It was referred to as the 'begging bowl' with major portion of our food requirements being met from imports from other countries. Farmers' of that era were a static entity even reluctant to go for any change in their crude and unscientific cultivation practices. Overhauling the agriculture sector was not possible without ensuring that the relevant technology reached out to farming community well in time as well as motivating the farming community to adopt the new technologies. In all these years of country's journey post independence, the agriculture sector has been the country's strength in its contribution in Gross Domestic Product (GDP) of the country, in providing employment to the population and as a source of livelihood for the vast majority of rural populace.

From a 'begging bowl' to a 'bread basket': India from a 'begging bowl' thus changed to a 'bread basket' and the fortune changed by what is known as 'Green revolution'. Dr. Norman E Borlaug was the person credited with the green revolution and from saving millions of lives in India, Mexico and Middle East. Back home, Dr. M. S. Swaminathan took green revolution as a project. The period corresponding to 1967-78 witnessed huge upsurge in food grains production especially in states of Punjab Haryana and Uttar Pradesh. Green revolution spread to millions of third world countries also. Reports reveal that the absolute number of poors peoples fell from 1.15 billion in 1975 to 825 million in 1995. All this happened despite a 60 per cent growth in population. Since the Green revolution of 1960s, India has never looked back. It is also here pertinent to mention that the country's undernourished population decreased from 247.8 million in 2004-2006 to 224.3 million in 2019-21, according to a report from the State of Food Security and Nutrition in the World in 2022. From scarcity to Self sufficiency: From a production of 50 million tonnes in the post independence years, the production has now

reached the 330 million tonnes mark. This has been achieved through a mix of technologies, interventions in agri and allied sectors, policy support and various legislations and reforms. This also has enabled the country to increase the production of food grains by 5.6 times, horticultural crops by 10.5 times, fish by 16.8 times, milk by 10.4 times and eggs by 52.9 times since 1950-51 thus making a visible impact on the national food and nutritional security. Country ranks first in the production of number of crops like Banana, Lime and Lemon, Papaya and Okra. The horticulture production in the country has exceeded food grains production in the country. The country has the largest area under cultivation. It is the largest producer of pulses, spices, milk, tea, cashew, jute, banana, jackfruit and many other commodities (FAO). It stands second in production of fruits and vegetables, wheat, rice, cotton and oilseeds. India is now the world's leading rice exporter; accounting for more than 40% of the global rice trade as per the data for the FY 2023 speaks. India has the largest cotton cultivation area all over the world after China and the USA and it is the prime agriculture commodity or fiber crop worldwide. India is the third highest potato producing country. India is also the second largest producer of Pulses in the world. In 2013, India contributed 25 per cent of the total pulses production of the world, the highest for any country. India is the 3rd highest potato producing country. The major Potatoes producing states in India are Uttar Pradesh, West Bengal, Bihar, Gujarat, Madhya Pradesh and Punjab. The country also has the largest livestock population. The challenges: Despite remarkable achievements in the agriculture sector, there has been another side of this achievement. We have not yet been self sufficient in Pulses and Oilseeds. The negative impact and threat posed to our environment by climate change and large scale indiscriminate use of chemical fertilizers and plant protection chemicals to increase the yields are now clearly visible. The ground water has been rendered poisonous and contaminated with harmful chemicals. Such is the infestation that vast stretches of land extending up to kilometers is now not fit for any drinking water. Soils have been degraded, turned barren and a large number of biodiversity has been lost. Biodiversity is on the decline. Yields of crops are not increasing and large scale nutritional insecurity is manifested through children, pregnant and lactating mothers and adolescent girls.

"If we are to achieve our goal of Viksit Bharat by 2047, various shortcomings in agriculture sector have to be addressed. The sector needs to embrace technologies which do not interfere with the environment, practices which are sustainable, and farming techniques like diversification and Integrated Farming System Models. At the same time it is also necessary that high value crops be promoted. Although we have attained food security for all, by nutritional security is a concern for all of us. To address nutritional security, a host of initiatives have been started. Biofortification and climate resilient varieties are being developed. A few days back Prime Minister of the country Sh. Narendra Modi released 109 climate resilient and bio fortified varieties of 61 crops including 34 food grain crops and 27 horticulture crops. From a chemical intensive green revolution, we have now to move towards an evergreen revolution based on the principles of natural farming, sustainability, local resource use efficiency, economic viability, social compatibility and profitability. Natural Farming is being promoted all across the country as environmental friendly approach. In the next two years one crore farmers would be roped in to practice natural farming. For this 10,000 bio-input resource centers would also be established all across the country. Food processing sector is a sunrise sector which can help realize vision 2047. The food processing in the country is at present very low. The food processing sector can be utilized to enhance income opportunities for the rural population, facilitate job creation, minimize food wastage, improve the availability of nutritious foods by enhancing the processing of fruits and vegetables, and augment the proportion of value-added products.To attract and retain Youth in agriculture, Entrepreneurship development schemes like Agri-Startups and skill development are being promoted with handholding and financial support to the youth who are interested in setting up agriculture or allied ventures. All these programmes have started showing results. Many youths have left their high earning jobs and started their own startups in agriculture and creating job opportunities for others also. Farmers particularly farm women feel more empowered, youths are now more skilled and the once static farming community is now a dynamic and vibrant one with collective approaches like Farmer Producer Organizations (FPOs) (Parveen Kumar, 2024**).** The growth of agriculture and allied sectors is critical for the Indian economy as about 49 percent of the population is directly or indirectly dependent on agriculture. During the last decade and so, the agriculture sector has undergone profound changes resulting in sharp deceleration in its growth (Ramesh Chand and Shinoj Parappurathu, 2011). The study has shown that agriculture sector has been able to show tremendous improvement in expansion of area and production of food grain and non-food grain crops. However, there are so many underlying factors responsible for slowdown of the agricultural growth (Naresh Singla and Mamandeep Kaur, 2015). Some of the factors identified include: Increase in area under non-agriculture uses, excessive dependence on rain fed farming, increase in number of agricultural labourers, reducing size of the operation holdings, over use of agricultural inputs, inequity in the distribution of agriculture credit along with sharp deceleration in public gross capitalformation in agriculture (Shoaib Ansari et al.,2022). The study pointed in order to achieve higher growth rate, there is a need to enhance the gross capital formation in agriculture sector particularly on irrigation so that more area can be brought under assured irrigation.

The recent economic survey noted that the agriculture sector in the country grew by 3 per cent in 2021-22, lower than an average growth of 4.6 per cent in the last six years. In 2020-21, the growth in this sector was 3.3 per cent. In 2016-17, the growth rate was 6.8 per cent, followed by 6.6 per cent in 2017-18, 2.1 per cent in 2018-19 and 5.5 per cent in 2019-20. The Survey said private investment in agriculture increased to 9.3 per cent in 2020-21. The public investment, however, remained at 4.3 per cent, the same as 2019-20. In 2011-12, the public investment in agriculture was 5.4 per cent. The survey, tabled in both the Houses of Parliament on Tuesday, said the performance of the agriculture and allied sector had been buoyant over the past several years due to the measures taken by Centre to augment crop and livestock productivity, ensure certainty of returns to the farmers through price support, promote crop diversification, improve market infrastructure through the impetus provided for the setting up of farmer producer organisations and promotion of investment in infrastructure facilities through the Agriculture Infrastructure Fund (www.thehindu.com, 2023). The survey also hailed schemes such as the Pradhan Mantri Kisan Samman Nidhi for helping farmers. Bringing equity in distribution of agricultural credit coupled with judicious and need-based agricultural inputs are some of the other recommendations drawn based upon the study. Agriculture is the dominant sector of Indian economy, which determines the growth and sustainability (Babita Thakur, 2012). About 65 per cent of the population still relies on agriculture for employment and livelihood. India is the first in the world in the production of milk, pulses, jute and jute-like fibers; second in rice, wheat, sugarcane, groundnut, vegetables, fruits and cotton production; and is a leading producer of spices and plantation crops as well as livestock, fisheries and poultry (www.shanlaxjournals.in). The performance of the agricultural sector influences the growth of the Indian economy. Agriculture has been a way of life and continues to be the single most important livelihood of the masses. Agricultural policy focus in India across decades has been on self-sufficiency and self-reliance in food grains production considerable progress has been made on this front. Food grains production rose from 52 million tonnes in 1951-52 to 257.4 million tonnes in 2011-12. India's food grain production is estimated at an all-time high 323.55 mill tones in the current crop year 2022-23 (Yashwant Singh Hartta, 2018). India managed to attain food self-sufficiency through a combination of technology- policy-institution framework. However, other functions of agriculture, namely providing surpluses and forward and backward linkages to non-agricultural sectors have largely remained unrealized. A policy reorientation to increase rural industrialization and skill improvement of the rural labour force is needed to move labour out of agriculture and increase productivity in agriculture. A better access of farmers to

input and output markets, technology and rural infrastructure are needed (www.academia.edu).

The evolution of Indian agricultural policy may be analyzed in the context of the role of agriculture in the development process and the factors affecting agricultural growth. In the development process of a country, agriculture serves mainly three functions i) to provide initial surpluses for other sectors of the economy ii) to provide wage goods to the industrial sector iii) to promote growth through forward linkages (provide inputs to industrial sector) and backward linkages (use outputs from industrial sector in agriculture). The first and the third functions require a robust overall agricultural growth whereas the second requires adequate food supplies. Therefore, for sustained economic growth , both overall agricultural growth and growth in food production are indispensable (Sekhar C.s.C. 2014). Agriculture is the dominant sector of Indian economy, which determines the growth and sustainability. About 65 per cent of the population still relies on agriculture for employment and livelihood. India is the first in the world in the production of milk, pulses, jute and jute-like fibers; second in rice, wheat, sugarcane, groundnut, vegetables, fruits and cotton production; and is a leading producer of spices and plantation crops as well as livestock, fisheries and poultry (T.Arimohan and P. BalaSubramanian, 2014). The performance of the agricultural sector influences the growth of the Indian economy (archive.mu.ac.in).

Agriculture has been a way of life and continues to be the single most important livelihood of the masses (www.semanticscholar.org). Agricultural policy focus in India across decades has been on self-sufficiency and self-reliance in food grains production considerable progress has been made on this front. Food grains production rose from 52 million tonnes in 1951-52 to 257.4 million tonnes in 2011-12. The share of agriculture in real GDP has fallen to14.1 per cent in 2012-13 given its lower growth rate relative to industry and services (Yashwant Singh Hartta (2018). However, what is the concern is that growth in the agriculture sector has quite often fallen short of the plan targets (T.Arimohan and P. BalaSubramanian (2014). During the period 1960- 61 to 2010 -11, food grains production grew at a compounded annual growth rate (CAGR) of around 2 per cent. In fact, the Ninth and Tenth Five Year Plans witnessed agricultural sector growth rate of 2.44 per cent and 2.30 per cent respectively compared to 4.72 per cent during 8th Five Year Plan during the 11th Five Year Plan, agriculture growth is estimated at 3.7 per cent against a target of 4 per cent. The Document paper of the 12th Five Year Plan approved by NDC emphasizes the need to "redouble our efforts to ensure that 4.0 per cent average growth" is achieved during the Plan if not more (Nikam Sachin Govind (2020). Without incremental productivity gains and technology diffusion across region, achieving this higher growth may not be feasible and has implications for the macroeconomic stability given the rising demand of the 1.2 billion people for food. Achieving minimum agricultural growth is a pre-requisite for inclusive growth, reduction of poverty levels, development of the rural economy and enhancing of farm income (T.Arimohan and P. BalaSubramanian (2014).

The Indian economy has undergone structural changes over time with the anticipated decline in the share of agriculture in the GDP (semanticscholar.org). Despite a fall in its share from 55.1 per cent in 1950-51 to 17.0 percent in 2008-09, the importance of agriculture has not diminished for two major reasons. First, the country achieved self-sufficiency in food production at the macro level, but still is a food deficit country facing massive challenges of high prevalence of malnourished children and high incidence of rural poverty (Seema Rani, 2015). The pressure on agriculture to produce more and raise farmers' income is high. Second, the dependence of the rural workforce on agriculture for employment has not declined in proportion to the sect oral contribution to GDP. This has resulted in widening the income disparity between the agricultural and nonagricultural sectors. The experiences of developed countries show that transfer of labour force from agriculture to non-agriculture; in particular the manufacturing sector took place. This had brought enhanced productivity growth in agriculture and hence higher income. However, India's manufacturing sector witnessed volatile growth and its share in GDP has almost remained constant at 15 per cent for the last three decades. Further, given the fact that the current economic growth pattern is driven by the service sector, lab our absorption outside agriculture will be slow until rural education improves dramatically in the near future. Under these circumstances, higher growth in agriculture assumes great importance and is a matter of concern for policy planners and research scholars in recent times. Sustained agricultural growth, which is facilitated through constant policy and institutional support has the potential to augment growth in the rural economy and associated secondary activities like food processing and retail trading. However, agriculture-led rural industrialisation has not received due attention from policy makers in the country notwithstanding the fact that maintaining the growth of agricultural per se was lost sight of during the 1990s (Ramesh Chand, 2007).

In fact, the growth performance of agriculture at the national level was splendid during the 1980s and its deceleration during the 1990s was attributed to the reduction in and/or stagnation of public expenditure on agricultural infrastructure, defunct extension services and biased economic reforms (Hirashima, 2000). Nevertheless, there has been a renewed policy thrust from the government since mid 2000s to revive agricultural growth through various development programmes such as interest subvention on crop loans, the National Food Security Mission, the National Agriculture Development Programme (Rashtriya Krishi Vikas Yojana) and the Pulses Development Programme. These programmes are likely to affect agricultural growth and farmers' income in the country by providing greater flexibility to the state governments to allocate resources to the priority areas of development. Aside, patterns and trends in India's agricultural growth is a well-researched subject. Systematic efforts were made to analyse growth in crop output and its elements through decomposition analysis. Historical aspects of agricultural growth, disparity and imp act on farmers' income and employment have been studied by several scholars (researchgate.net).

With the intension of helping farmers to come out of vicious circle of poverty and to ensure fair price for their products the present government took a lot of measures. One such measure is the introduction of the Farm Bills 2020.The Bills aimed at opening up agricultural trade and marketing outside the notified Agricultural Produce Market Committee (APMC) Mandis for farmers, removes barriers to inter-State trade and provides a framework for online trading of agricultural produce in India.The Three Farm Bills 2020 was introduced in Lok Sabha on 14 September 2020, passed in Lok Sabha on 17 September 2020. It was passed in Rajya Sabha on 20 September 2020. The Indian Parliament onNovember 29, 2021 passed a bill to withdraw three farm laws after thirteen months of protest by the farmers from Punjab, Western UttaraPradesh and Haryana in Delhi. The government made a statement like "The bills were brought in the interest of the farmers and they are being withdrawn in national interest". In this sectionan attempt has been made to bring out the significance of agricultural sector in the absence of these Farm Bills for the development of farmers. Generally entrepreneurs all over the world, particularly in the manufacturing sector, have the power to fix/decide the price of their products from fair price, as they used to claim sometimes, to a maximum level of price known as Maximum Retail Price (MRP), by taking into account of the demand for their products in the open markets. Even self-employed people, both seasonal and unseasonal, like street vendors, barbershops, ironmen, painters, construction workers, carpenters, meat and fish vendors have the right/capacity/power to fix the price of their products/services individually or through their own unions/associations in which they associated in the economy. Unfortunately this is not the case with respect to agricultural and agricultural related products, particularly, in India. In India though the farmers produces so many verities of agricultural products like foodgrains, vegetables, fruits, cereal items, flowers, spice items, corn, milk and milk products, sugar and most vegetables, cotton, pulses, millet, cottonseed, and spices etc., they have no role/right over fixing/deciding the price for what they produce and also they have no capacity to control over the agricultural markets all over India.

There are middle men/agencies who have no work directly associated with agriculture or villages/rural areas having the right/capacity over fixing the price level for agricultural products according to demand and supply conditions. Since the middle men took the role of producer to fix the price of agricultural products and sharing only a certain percentage of the profits, the farmers are not getting what they supposed to get from the sale of their products. Many research reports estimated/calculated based on empirical studies have stated that the farmers are getting only 1/3 of the profits at present, which is just enough to meet the cost of cultivation including the farmers his labour cost. This is aggressively practiced along with reduction of barter system in rural areas after independence and this practice not changed even after adoption of Liberalisation, Privatisation and Globalisation (LPG) policies from June 1991. There are many reasons for this. I would like to list out some of them one by one:

(1) Agricultural products are highly perishable in nature. Farmers cannot store them for long period in their houses or in their villages. Village people have no common storage facilities like air conditioned Godowns and large warehousing facilities to store their products in large quantities. The Food Corporation of India (FCI), and state agencies like "Mandi" which are supposed/have the right to procure paddy and wheat from the farmers during the harvest seasons at Minimum Support Price (MSP), and store the procured items in their warehouses, to be distributed through public distribution system (PDS), some times store them in open space due to lack of warehousing facilities/storage facilities. The stored products in the open space used to get affected if there were sudden rain falls and floods. Simply to be thrown out for animals or destruction and became food for rats and insects. Nearly 30 per cent of what India produces each year is simply wasted due to lack of storage facilities, both air-conditioned storage / warehousing and processing facilities at village level. Rats used get a lot of foods. That is why Economist Amartiya Sen once stated that in India rats are healthier/fater than human beings. Prof. Rangarajan Committee Report 2014 on Poverty, which has retained consumption expenditure as the basis for determining poverty, has stated that about 29.50 per cent of the population in India live below the poverty line and not having three times of food and going to bed without food. About 35 per cent of the children who are studying in the government schools in rural areas are suffering from malnutrition. About 9/10 pregnant women are suffering from anaemia in India and giving birth low wait malnourished children. According to the Global Nutrition Report 2018India has about 46 million children with stunted growth in the year 2018. So it is highly unacceptable to waste about 30 per cent of food items cultivated in India when 30 per cent of the people live below the poverty line without sufficient quantity of food. To avoid malnutrition the New Education Policy (NEP 2020) decided to provide nutritious breakfast and lunch from the age three onwards. To resolve this problem government has to construct air conditioned warehousing facilities/large godowns to store the products of the farmers.

Not only storing the products, the stored items should be processed and converted into value added products through establishing food processing industries. Air conditioned storage facilities and food processing industries would create a huge amount of employment opportunities in the rural areas. Most of the European countries food processing industries playing a major role in providing employment opportunities. If farmers are getting employment opportunities in farm itself for 120 days, the remaining days they will get employment opportunities in the storage places and food processing industries. Government should construct Godown/warehousing facilities/air conditioned storage facilities in each village, in addition government has to provide air conditioned container facilities in almost all the villages to transport them. Air conditioned containers will be used to transport the processed products to the marketing centres, air ports and ports for sales and export purposes. Public and Private Participation (PPP) should be encouraged for this purpose. Not even a single per cent of food items should be wasted in India. We hope that The newly passed Farm Bills 2020 would help, to a large extent, to fulfil this requirements. These farm bills assure an increase in farmers income, increase in farm products exports, more FDI in agricultural sector, emergence of more entrepreneurs from rural areas in food processing industry. The ultimate purpose of these farm bills is to ensure farmers to get fair price for their products and that too to be decided by the farmers. Educated youngsters should be encouraged to start food processing industries under Make in India pregame, Start up programme and MUDRA Schemes. Once enough employment opportunities are created in the rural areas, automatically it will stop migration of talented youngsters to urban areas, in search of livelihood. It will solve rural urban migration, interstate migration and inter country migration also after some time. There are about 80 per cent of the Indian farmers are marginal land holders. They don't have much space to store their products either in the farm or in their houses except a minimum quantity required for their personal use.

Since formal financial credit system is very much limited for the farmers, particularly marginal farmers, they used to approach the money lenders or informal banking institutions for financial support for buying seeds, ploughing the lands, for replanting, buying fertilizers, pesticides and some times buying water during the dry season etc. That too very high rate of interest ranging from 24-36 percent interest.So the farmers are always under stress to repay their loans immediately after harvest to avoid additional rate of interest. Because of the money lenders pressure to get their loan money back and high rate of interest, the farmers were forced to sell their products immediately after harvest to avoid any penal interest. This type of sales generally known as distress sale. When every farmer brings their products to the market in large quantities at a given time, supply over takes demand, automatically the price level goes down. Middle men also available to exploit the situation. In this condition the farmers will never get the price for their products and forced to sell their products at lower price, which is less than 35 of cost of cultivation. Under this circumstance the farmers could not get required price for their products. Finally they could not repay their loan borrowed money from moneylenders and under stress. Unable to withstand this debt trap and stress, when money lenders use a third grade methods to extract their money with interest rate from the farmers, they were forced to commit suicide. So far more than 3 lakh farmers have committed suicide in India during the period from 1995 to 2019. According to the All India Rural Financial Inclusion Survey 20015-16, about 47 per cent of the farmer's households are under debt.

Right from before independence and also after independence we heard a lot and discussed a lot by economists, political parties and academicians about a statement like "Agriculture is the backbone of Indian economy and India lives in villages". Though agricultural contribution to GDP is reduced from about 65 per cent at the time of independence to 14 per cent at present, its power of holding rural masses or providing employment to about 49 per cent of the total population and its capacity to hold 70 per cent of the rural population with it are not reduced drastically. Still about 49 per cent of India's population directly engaged in agricultural sector, the largest unorganised sector. Even before independence, our Father of Nation Mahatma Gandhi made a statement like, "India is not Calcutta and Bombay, but lives in her seven hundred thousand villages". Really this statement is true and relevant, even after 74 years of independence, at present. It is true that more people, about 68.80 per cent or about 925 million, as per the Census 2011, live in villages. If population strength is the backbone of the economy then this statement is may be true. If population is not the criteria definitely one can state that they are not the backbone of Indian economy. On the other hand one can say that they are the weak bone of Indian economy. Which sector is really backbone of Indian economy in terms of GDP contribution at present? Definitely one can pointed out that it is the service sector only, which contributes a maximum to GDP. Yes it is only the service sector which contributes about 61.50 per cent of GDP, agriculture and industrial sectors contribute 15.40 per cent and 23 per cent respectively in the year 2017. So as far as the size of the population is concerned rural economy may be a mighty one but as far as the contribution of GDP is concerned service sector

is playing a major role. This statement on 'agriculture is the backbone of Indian economy' might be true upto few decades back. Now the condition is entirely different.

Due to implementation of 144 and lockdown for 21 days in the "First Phase of Lockdown" the agricultural sector, though "exemptions are given as an essential service sector" is also very much affected. Harvesting of paddy and wheat is not taking place due to non availability of workers and harvesting machines. Such reports are coming everyday in the Medias. Flower cultivators lost their livelihoods since no such large gatherings like marriage functions, cultural ceremonies and temple festivals etc., The demand for milk also reduced due to lack of transport system. About 500 million landless agricultural daily wage workers, MGNREGP workers are the worst affected people in rural area. The central and states declared exceptions to the agricultural sector. But without transport system, fertilizers, pesticides, labourers and seeds one cannot think of agricultural operations. Government support is the only support system which is available at present.

India is a country of about 1. 4 billion people as on 7th October, 2020. Agriculture is the major work of India's rural areas. Indian agriculture is generally characterized by small farm holdings. The average farm size in India is only 1.57 hectares and about 93 percent of farmers are having land holdings less than 4 hectares and they are cultivating about 55 percent of the cultivable land. Just opposite to this only 1.6 per cent of the farmers have operational land holdings of more than 10 hectares and they are cultivating about 17.4 percent of the total cultivable land.

Strength of Indian Agriculture:

Due to diverse agro-climatic conditions existing in the country with four ecologically sensitive areas like Western Ghats with an average rainfall of 3,000–4,000 mm, Western Himalayas, Eastern Himalayas and Andaman Nicobar Islands, a large number of agricultural commodities are produced in India. Broadly, these can be classified into two groups - foodgrains crops and commercial crops.Because of the climatic conditions India is able to produce more with the support of available population in rural areas and became number one and number two in most of the agricultural products. India is number one in the case of milk production in world with about 187 million metric tons in the year 2019. The 70th round National Sample Survey (NSSO) revealed that 23 per cent of agricultural households with less than 0.01 hectare of land reported livestock as their principal source of income in villages.

Government of India's as well as state governments initiatives are one of the important factors for increasing production of most of the items. Achieving green revolution in the Fourth Five Year Plan is an example for this. In the year 1950 India produced about 54 million tones of foodgrains. Now India stands second in foodgrains production, next to China, with 316.06 million tones during the period 2021-22 and it was 291.95 million tones during the period 2019-20. The total horticulture output is about 333. 35 million metric tones during 2018-19. In the case of milk production we produced 209.96 million tonnes in 2020-21. It was 146.31 million tonnes in 2014-15 .

Role of Farm Bills: Each of the three bills deals with one aspect of agricultural marketing. Collectively, they are designed to reduce barriers that diverse agri-food supply chain actors face in connecting to farmers. They aim to do so by reducing reliance on traditional APMC-based intermediaries ('disintermediation') and by creating a unified national market (one nation – one market). Despite the titles of the bills highlighting 'farmers', rather than focusing directly on farmer welfare all three bills rely overwhelmingly on supply chain actors to take advantage of the new rules and share their gains with the farmers (theindiaforum.in)

The bills are: "(a) one related to APMC, (2) related to contract farming and (3) related to essential commodities".

- The Farmers' Produce Trade and Commerce (Promotion and Facilitation) Bill, 2020, allows farmers to sell their products outside the notified Agricultural Produce Market Committee (APMC) "Mandis" numbering about 7500 all over India particularly in the "first green revolution" states like Punjab, Haryana, and Western Uttar Pradesh, without paying any State taxes or fees. The total number of wheat purchase centers at present is 21,869. This bill has the following advantages as (1) to create an ecosystem where farmers and traders enjoy the freedom to sell and purchase farm produce outside registered "Mandis" under states APMCs, (2)To promote barrier free inter state and intra state trade of farmers produce, (3) to reduce marketing or transportation costs and help farmers in getting better prices, (4) To provide a facilitative framework for electronic trading (indiatimes.com).
- The Farmers (Empowerment and Protection) Agreement on Price Assurance and Farm Services Bill, 2020, ensures contract farming and direct marketing. The advantages of this bills are (1) Farmers can enter into a contract with agribusiness firms, processors, wholesales, exporters or large retailers for sale of future farming produce at a pre-agreed price (2).Marginal and small farmers with land less than five hectares to gain via aggregation and contract (marginal and small farmers account for 86 per cent of total farmers in India) (3) to transfer the risk of market unpredictability from farmers to sponsors (4) to enable farmers to access modern tech and get better inputs, (5)to reduce cost of marketing and boost farmers income, (farmers can engage in direct marketing by eliminating intermediaries for full price realization (6) effective dispute resolution mechanism with redressal timelines (indiatimes.com).
- The Essential Commodities (Amendment) Bill, 2020, de-regulates the production, storage, processing, movement and sale of several major foodstuffs, including cereals, pulses, edible oils and onion except in the case of extraordinary circumstances. This bill is already in practice only an amendment was made. This bill also has the advantages like (to remove commodities like cereals, pulses, oilseeds, onion and potatoes from the list of essential commodities. It will do away with the imposition of stockholding limits on such items except under "extraordinary circumstances like war (2) This provision will attract private sector or FDI into farm sector as it will remove fears of private investors of excessive regulatory interference in business cooperation's (3)To bring investment for farm infrastructure like cold storages, and modernizing food supply chain, (4) To help both farmers and consumers by bringing in price stability, (5) to create competitive market environment and cut wastage of farm produce (indiatimes.com).

Now let us look into the expected role of recently passed as well as withdrawn three farm bills, how they are going to rectify all these problems and take the agricultural sector to the level of development such as industrialization of agricultural sector, empowerment of farmers, and enrichment of the farmers through increasing their income without middlemen, increasing the bargaining power of the farmers, controlling the production, market price and market size, storing the products, processing the products, value addition of the products, finding market for agricultural products in faraway places within the country and foreign countries.

Major Issues related to these Bills:

(a). Minimum support Price (MSP): The farmers feel that MSP may not be available for them hereafter after the introduction of the first bill. But government of India clarified that the system of MSP will be continued along the open market system. But there are reports stating that only 6 per cent of the farmers used to sell their produce under MSP rates. The Shanta Kumar Committee's 2015 had verified this based on National Sample Survey (NSS). Food Corporation of India (FCI) along with state agencies like Mandis undertakes procurement of wheat and paddy under Minimum Support Price (MSP) scheme. The Department of Agriculture and Co-operation, Government of India used to declare Minimum Support Prices (MSP) every year

based on the recommendations of the Commission for Agricultural Costs and Prices, for about 22 crops, before their sowing seasons. The idea behind MSP is to give guaranteed price and assured market to the farmers and protect them from the price fluctuations. In the case of coarse grains, as directed by Government of India on time to time, are procured by State Government Agencies for Central Pool.

Food Processing Industries: The food processing is a process I which raw foodgrains, fruits, vegetables, cereals items are converted into ready to use/eat items or half cooked items, fibre, fuel, industrial raw materials through some industrial process like processing, conversion, preparation, preservation and packaging of agricultural products including milk and milk products, livestock, aquaculture products, poultry, alcoholic beverages, , plantation, consumer product groups like confectionery, chocolates and cocoa products soya-based products, mineral water, high protein foods and meat items. This sector is highly labour intensive one and operated at traditional, family level, micro, small, medium and large scale levels.

Food Processing Industries are playing a major role in bringing the "farmers together" at local level and the "final consumers" at national and international levels. The third Farm bill 2020 assures investments across the value chain in India. There are 1.85 million people working with 39,748 registered food processing industrial units in India. Its fixed capital is that of $ 32.75 billion and aggregate output is around $ 158.69 billion. Foodgrains, sugar, edible oils, beverages and dairy products are some of the major food processing industries in India. Reserve Bank of India has stated that only less than 10 per cent of agricultural products are processed in India. Demand for processed food items is keep on increasing not only in cities in India but also at rural areas. This sector creating opportunities for more value addition, reduce wastages and creating employment opportunities at rural areas. Government of India identified food processing industries as a priority sector under "Make in India" programme.

Though the starting of the food processing industry is having so many problems like investment problems, lack of credit facilities, less market facilities within and outside India, export of processed food items, etc., the Ministry of Food Processing Industries has identified certain fundamental problems like (a) lack of infrastructural facilities like godowns, warehousing facilities, air conditioned storage facilities, air conditioned container transport facilities, good road connections between rural and urban areas, and distribution facilities etc., (b) There is no adequate link/connection between the farmers and processing industries due to lack of awareness and education among the farmers. (c) Indian agriculture is mainly based on South West Monsoon and North East Monsoon. Failures of these two as well as late arrivals of these two used to affect the production and productivity of agricultural products. Monsoon failures, floods, cyclone, drought resulted in low capacity utilizations of the food processing industries. (d) At present farmers are supposed to sell their products to Mandis which very much controlled by Agricultural Produce Market Committee. An Agricultural Produce Market Committee is a marketing board established by a state governments in India to ensure fair price for the farmers as well as safeguard them from exploitation by large retailers. Now government feel that they are standing against the interest of the farmers in starting food processing industries since they have control over the marketing of agricultural products (e) The Food Safety and Standards Authority of India (FSSAI) which is functioning under Ministry of Health and Family Welfare, Government of India, implements the food regulations as directed by the Food Safety and Standards Act, 2006 and became effective from the year 2011.But this body is playing effectively in controlling and monitoring the quality and safety stands of manufacture, sale, distribution, or import food products and (f) food processing industries need a lot of innovative thinking to face the market and attract the people by introducing new and creative new items (Government of India, 2018, RBI, 2020). Government of India has many joint ventures, foreign collaboration, industrial licenses and 100 export oriented units envisaging an investment, but far Food processing industries are concerned they attracted only about Rs.10,000 crore worth of investment so far. The advantages of the Farm Bills 2020 if these bills were not withdrawn.

To increase the farmers income: Though agricultural sector is considered as primary sector and coming under essential commodities sector by attracting government attention through budgets every time in the form of subsidies, credit facilities, Minimum Support Price, low prices of fertilizers, power, irrigation, agriculture-credit, crop insurance, etc., the farmers are still at the bottom of the economy as far as income and lifestyle is concerned. According to the Situation Assessment Survey of Agricultural Households conducted by 70th Round National Sample Survey in the year 2013, after that no survey was conducted, the average monthly income per agricultural household was Rs. 6500/-. Now government wants to double this amount by 2022. This low income is the main the reason for farmers leaving the agricultural sector. In the open labour market if someone wants to go for paint work/carpenter work/construction work/electrical work/plumbing work in Kerala one would get about Rs. 1100 per day. If 25 days work is available means one can easily make Rs. 27500/- per month. Now you can see the difference between farmer's income and non farmer's income and why farmers are not wanted to be farmers? So low income is the main reason for why about 150 million rural workers migrated to rural areas to urban areas in India known as interstate migrant workers. We witnessed their sufferings when government of India announced the lockdown of the country from 25th March, 2020 in the First Phase. So these bills promised to increase the farmer's income through opening the agricultural sector for more investment, processing units and exports.

Right over fixing the Price: So far farmers have had no role in fixing/deciding the price of what they produced at least by considering the cost of cultivation. They were simply "price takers" in the market. Farmers are not like any of the following sectors such as automobile sector, consumer durable sector, iron and steel sector, cement and paint sectors, even fish, beef and mutton markets where prices are fixed by the sellers/manufacturers/employers. But in the agricultural sector it is the middle men who fixes the price most of the time and/or for certain commodities, the government fixes the price under Minimum Support Price schem. Do they calculate the actual cost of cultivation like labour cost, production cost and other costs involved in the production of paddy/wheat, flowers, fruits, vegetables etc.,? Definitely "no". So a high level of exploitation is taking place in the agricultural sector. These thee New Farm Bills came as a saviors to end this practice and wanted to find solutions to this never ending discrimination and an answers to farmers pathetic conditions.

3. To Attract more FDI : One of the basic purpose of adopting Liberalization, Privatization and Globalization (LPG) of Indian economy in the year 1991 is to invite more Foreign Direct Investment (FDI) into various sectors of the economy. When World Trade Organisation (WTO) was formed in 1994 this intension had increased with agricultural products also included in the WTO as Agreement on Agriculture (AOA). Similarly when Government of India introduced Special Economic Zones Act in the year 2005 everybody was expecting more FDI would be flowing into the agricultural sector.

One of the major reforms over the years for the Indian agriculture sector is the inflow of Foreign Direct Investment (FDI). Department for Promotion of Industry and Internal Trade (DPIIT), which regulates the promotion, facilitation and approval for FDI in India, allowed for 100 per cent FDI under the automatic route for the following agricultural products such as: a. Floriculture, b. Horticulture, c. Apiculture, d. Cultivation of vegetables and mushrooms (under controlled conditions), f. Development and production of seeds, g. Planting material, h. Animal husbandry (including breeding of dogs), i. Pisciculture, j. Aquaculture (under controlled conditions), k. Services related to agro and allied sectors, and l. tea cultivation. Even though after taking such initiatives FDI in agricultural sector is not upto the expected level. After introduction o these Farm Bills 2020 agricultural sector particularly food processing industry will attract more FDI in the form of credit, infrastructure

development, transport facilities in rural areas, marketing, advertisements and trade promotions activities within local and outside India. All these activities will promote more employment opportunities for the rural people in India.

To Increase Production and Productivity:

The concept of contract farming ensures more production and productivity in the agricultural sector by ensuring timely agricultural credit for various farm operations, insurance for natural calamities, and development of agriculture as an industry. Under these bills the farmers income is guaranteed/ensured through pre agreed price, quality, quantity and time of delivery. The risk associated with cultivation is very much reduced and the farmers debt will be reduced/become debt free.

To Increase Market Share in the International Market: India's export share in the international market was about 2.4 per cent before independence, when India was exporting only agricultural based traditional items like jute, cotton, spice items and oil cake etc. After independence this share had decreased to .5 per cent level and it remained in the same level upto 1995. Now India has so many export promotion councils for each and every products such as Engineering Goods Export Promotion Council, Gems and Jewellery Goods Export Promotion Council, Leather Goods Export Promotion Council, Pharmaceutical Products Promotion Council, Computer Software Export Promotion Council, Sports Goods Export Promotion Council, Chemicals and Allied Products Export Promotion Council, Basic Chemicals, Cosmetics and Dyes Export Promotion Council, Project Exports Promotion Council of India, Service Export Council, Plastics Export Promotion Council, Cashew Export Promotion Council. In addition to these we have Coconut Development Board, Spices Board, Rubber Board to guide the farmers to export more, research activities and marketing facilities through subsidies, and incentive packages etc. Still India is not able to reach the level of pre-independence share of exports at international level. Recently government of Indiavigorously pursuing the target of doubling India's export sharein world exports to 3.4 per cent from 1.6 per cent (2018-19). All the three agricultural market reforms bills are designed to achieve this target. After implementation of Agricultural Export policy in the year 2018, India exported agricultural and processed food items worth of $38.49 billion in the year 2019 to more than 100 countries particularly Middle East, Singapore, Malaysia, Thailand, Indonesia in the Southeast Asia region, European Union, SAARC countries, Japan and United States. Indian food processing industry is mainly focussing on exports. Though India is the second largest producers of agricultural products India did not come within top 10 farm product exporting countries. India's share agricultural products is only 2.2 per cent out of $1.6 trillion global agricultural trade. It is s welcome effort since the new farm bills advocate for increasing more and more farm products exports at global level through Public and Private Farmers Group participation.

World-Class Rural Infrastructural Development: It is quite common to experience/see if one visits in rural areas of any parts of India, except states like Kerala, with poorly maintained roads, without proper health services/facilities, poorly maintained schools, and hospitals, without proper and timely transport services, lack of good hotels and restaurants, without entertainment parks, people with poor/weak health conditions, children with malnutrition etc. Nobody can deny it. Though 70 per cent of the population live in rural areas but 85 per cent of the high tech hospitals are in urban areas. Shopping malls, metro trains, AC busses available only in urban areas. Disguised unemployment, less farm price for farmers products, low wage rate, lack of marketing opportunities etc are the main reasons for poor development of the life style of the people as well as poor maintenance of the rural infrastructural facilities.Providing Urban Amenities to the rural people is the main dream of our Former President Dr. A.P.J. Abdul Kalam. If all these three bills are successfully implemented, that will bring prosperity to the rural areas in the form of employment generation, income generation, awareness, education and other developments needed for the rural population and finally fulfill the dreamt of Abdul Kalam.

No More Waste of Agricultural Products: The type of farming system in practice and varied regional climate conditions prevailing in India have immensely contributed to Indian economy. India is at present the second largest producer of foodgrains, fruits, vegetables, flowers, milk, meat and cereal items. For some of the fruit productions India stands first in the world like bananas with 29.64 million metric tonnes, papaya with 5.64 million metric tonnes, Mangoes with 21.28 million metric tonnes, guavas production amounted to 4.34 million metric tonnes during the period 2019-20. In the case of Milk production also India stands first in the world. Milk production in the country is expected to reach 208 million tonnes in the year 2021 from 198 Million tonnes at present. India also stands first with buffalos population with 108.7 million. India stands second in some of the agricultural products like pulses with 23.01 million tonnes and vegetables with 188 million tonnes in the year 2019-20. In the case of foodgrains production, It is about 291 million tonnes in the year 2019-20. In most these items China stands first. India though second largest producer, out of these total productions, about 30 per cent of the foodgrains, fruits and vegetables items are simply wasted due to lack of godown facilities, storage facilities, proper transport facilities, road facilities and marketing facilities. Once Multinational Corporations (MNCs), and private investments are allowed in the agricultural sector all these facilities/developments will be established in villages. All agricultural products will be processed and converted into value added products. These processed products should be stored in the air conditioned godowns and could be released whenever market is available for such products. They will be kept in the godowns if there is no market for such products within/outside India. This way we can maintain the higher price level and could avoid crushing of the price level when there was no demand. If there is no market at local level farmers can go for international markets. The problem of distress sale of agricultural products at lower price is completely eliminated here. Not even a single per cent of foodgrains and vegetable items will be wasted in India. It is estimated that about 60 per cent of processed food items in the "Hyper Markets" /"Super Markets" in India came from China or other countries. It is a lesson for India. We have to find answers to why we are not able to process our own products in rural areas and sell it in these markets and export to China and other countries? These three market bills came with solutions/answers for these issues.

The country has made big strides in agriculture. Post-liberalisation, the yield has increased, and is the third-largest producer by value. However, the sector realises only 50 to 60% of its potential. Price realisation is affected by the APMC Act and middlemen. Except for a few crops (rice, wheat) and a few States (Punjab, Haryana, Andhra Pradesh), the selling price for the farmer is 15-50% below the minimum support price (MSP).The country's food processing value addition is less than 10% of the produce while for most developed economies this is 100 to 300%. The agriculture sector employs over 52% of the workforce, contributing to only 14% of the GDP. Incomes have been stagnant over the last decade with the average worker earning less than 60-70% of the income of their counterparts in the city. With labour moving to rural India and depressed consumer demand, incomes could drop by about 10-20%. Agriculture and food processing GDP contribution has to rise to close to 20% while surplus labour needs to be deployed in manufacturing and food processing. The sector needs to grow at 5% per annum, which is double the historical growth rate. Increasing remuneration via MSP has drawbacks. It couldn't be enforced beyond three States and it triggered food inflation and macroeconomic instability. There are other ways (a) increased price realisation for the farmers, so [that] they get most of the consumer surplus, and (b) use of technology and supply aggregation platforms for storage, logistics and better price discovery. There is potential to create a segment of processed and branded food, to increase farmers' income. The country should follow a five-point agenda for reform: (1) focus on sustainable yield improvements through scientific farming practices; (2) improve agriculture marketing to increase farmers' price realisation through

policy changes; (3) set up an Integrated Agriculture Export Mission to scale up food processing and exports to increase value addition from 10% to 50%; (4) promote direct marketing through farmer producer organisations; and, (5) seriously work on reforms in the agriculture sector (Mini Tejaswi,2020). In a study conducted by Centre for Water Resource Development and Management between 2014 and 2019 covering Kozhikode district of Kerala and Tikamgarh district of Madhya Pradesh and Gujarat has found that "The increase in the maximum temperature ranged from 0.43 degrees Celsius to 1.92 degrees Celsius. The minimum temperature showed an increase of 0.66 degrees Celsius to 2.17 degrees Celsius. Rainfall was reported to have gone up by 166 mm to 1,434 mm. The main reasons for these are what scientists call "anthropogenic activities" that include deforestation, industrial pollution, soil erosion, and land degradation. The yield from rice, banana, rubber, coffee, black pepper, coconut, and arecanut, all rain-fed crops, showed a decline of 0.3% to 33% under different scenarios. The total crop water requirement of major crops such as coconut, paddy, and banana increased with a rise in temperature, enhancing the irrigation water demand. Since a rise in the mean temperature above a threshold level will cause a reduction in agricultural yield, an increase in maximum temperature by one, two, and three degrees Celsius could reduce the grain yield of rice by 6%, 8.4% and 25.1%, respectively, if all other climatic variables remain constant. The grain yield of rice declined by 10% for each one degree Celsius increase in the minimum temperature during the growing season. Crop climate suitability is also changing abruptly because of climate change, says the study. As much as 81% and 64% of growing areas of coffee and black pepper may not be suitable for these crops in future unless effective management strategies are adopted. The yield can be sustained or improved in the case of coconut, coffee, arecanut and black pepper if the crop is irrigated. Since about 80% of the land is under rain-fed farming in Kerala, it is essential to manage every drop of water received through rain, especially during summer, by effective implementation of soil and water conservation steps. Mulching with green and dry residues of crops is important for reducing the higher soil temperature as well as for conserving available soil moisture.The study was in research collaboration with International Institute of Applied Systems Analysis, Austria; National Institute of Hydrology, Roorkee, Uttarakhand; and the Institute of Rural Management, Anand, Gujarat. It was funded by the Government of India think-tank Technology Information, Forecasting and Assessment Council of the Department of Science and Technology (thehindu.com, 2022).

The recent findings of the Intergovernmental Panel on Climate Change (IPCC) are a clarion call for the entire humankind. The IPCC's warning is consistent with the findings of a study conducted by a group of German researchers who compared the Indian monsoon with more than 30 state-of-the-art climate models from all around the world. The report made it clear that "For every degree Celsius of warming, monsoon rains will likely increase by about 5 per cent". There is no escaping this unless policymakers across the world make concerted efforts to reduce greenhouse emissions. UN secretary-general, António Guterres, to describe the IPCC report as a "code red for humanity", which means we are reaching a point of no return; it's a do or die situation for us. The impact of climate change is evident on the Indian monsoon, which has become more erratic and violent over the last few years. The increasing variability in precipitation has resulted in prolonged dry spells followed by a heavy downpour. A more chaotic monsoon will have a grave bearing on Indian agriculture and food production. The below-normal rainfall has sparked concerns over the output of summer-sown crops such as cotton, soybean, corn and rice. Being the largest exporter of rice and the top importer of edible oils, a drop in production could only put pressure on the country's burgeoning trade deficit. Looking at the economic costs of the climate emergency, India was singled out in a 2020 report by Oxford Economics, a global forecasting firm, which predicted that the country's GDP could fall 90% by the end of the century if it doesn't improve on current policies. Crop failures and increased infestation of pests and insects have become rampant. It will not be an exaggeration if we link these extreme climate events to farmers' suicides. The rising temperature, if left unchecked, would not only jeopardise food security but also make India dependent on food imports. To understand the impact of climate change on Indian Agriculture and develop strategies for possible mitigation, the union agriculture ministry formed National Innovations on Climate Resilient Agriculture (NICRA) in 2011. The study, conducted to analyse the impact of rising temperatures on crops, livestock and fisheries, identified 151 climatically vulnerable districts across India. The findings suggested that rice and wheat in Indo-Gangetic plains, sorghum and potato in West Bengal and sorghum, potato and maise in the southern plateau could see reduced productivity. A 1-2 degrees Celsius rise could potentially decrease rice production by about 0.75 tonnes per hectare (t/ ha) in inland zones and 0.06 t/ha in coastal regions. At the same time, a 0.5?C increase in winter temperatures is projected to reduce wheat yields by 0.45 t/ha. Similarly, research by National Dairy Research Institute, Karnal, also found that heat stress could adversely impact the fertility of cows and buffaloes. Moreover, the whimsical climate pattern is reducing the number of fishing days as well as fishing stock. Ocean warming has wiped out much commonly eaten fish and forced several species to move poleward or towards deeper waters to stay at the ideal temperature. Another concern is the decrease in the nutritional value of significant crops due to the rising CO2 levels. The lower concentrations of important dietary micronutrients like zinc and iron in major food crops could be attributed to a sharp increase in carbon emissions. Rising CO2 could also reduce access to adequate levels of important vitamins in rice. The IPCC report also warned that the protein content of rice, wheat, barley and potatoes could fall by 6 to 14%, putting close to 15 crore more people at risk of protein deficiency. With reduced yield, food prices could rise as much as a third by 2050, bringing an additional 18 crore people in low-income households (Siraj Chaudhry, 2021).

Agricultural sector is not a remunerative sector or profitable sector to the farers. Farmers are getting only one third of the profit they make. Two third of the profit is taken over by the middle men/traders who engaged in the agricultural trade. Because of lack of profit the farmers are not ready to be farmers. The agricultural sector did not attract the younger generations. The educated younger generations moving out of their villages in search jobs in the non-agricultural unorganised sector. National Sample Survey Organization (NSSO) 2007 had reported that about fourty four per cent of the farmers in India do not want to be farmers. "They would rather quit if they had an alternative jobs. Tata Institute of Social Sciences, Mumbay and Indira Gandhi Institute of Development Research Mumbay conducted a study on why farmers are committing suicide in Maharastra for providing policy inputs for the government to intervene in the matter of suicide and preventing them. Both these studies concluded that indebtedness was the major cause for suicide among farmers (Srijit Mishra, 2006).

Farmers are facing are facing problems after problems when they do farm activities. Farmers are not getting credit facilities, farmers are not getting price for their products, air-conditioned storage facilities are not available, food processing facilities are not available, food processing industries also not available and marketing facilities are not available both within and outside India. So nearly four lack farmers have committed suicide from 1995 to 2017 due to the above problems (Jaideep Hardikar, 2021). The way the information and communication revolution which took place in ICT sector in India by attracting much FDI not happened in Industrial development and also agricultural development. Another problem is that most of the development schemes designed by the successive governments were not fully implemented with spirit as well as due to corruption. There is a delay and delay in implementing the programmes in the agricultural sector. The end result is slowdown of GDP. After adopting Liberalisation, Privatisation and Globalisation (LPG) policies for the past 34 years the people exactly did not understand what is exactly the meaning of LPG itself? There are doubts arising now whether the government really understood it and interested in implementation of LPG policy or is acting as liberalising the economy or not? Whatever it may be the benefits of liberalisation did not reach the farmers in rural areas. It is discussed in the media and among the experts that the slowdown of GDP is due to the reduction

of cash in the people and the people are not spending any money or the consumers are not consuming anything at present. The development benefits LPG programmes not reached the 6, 33, 555 villages and remote areas in India. Nobody can deny it. India is number two in most of the agricultural products. But the Food Corporation of India which is the main procurement agency in India has the capacity of storing only 95 million tonnes of foodgrains. Most of the time the foodgrains are stored in open spaces and destroyed when sudden rainfall or flood occurs due to climate change. About 30 per cent of the agricultural products are wasted due to lack of storage facilities. Once Amartya Sen has stated that in India rats are healthier than human beings because they are eating more foodgrains wasted in the godowns.

Strengths of Indian Agriculture: India is a country of about 1. 428 billion people at present. Agriculture is the major work of India's rural areas. Indian agriculture is generally characterized by small farm holdings. The average farm size in India is only 1.57 hectares and about 93 percent of farmers are having land holdings less than 4 hectares and they are cultivating about 55 percent of the cultivable land. Just opposite to this only 1.6 per cent of the farmers have operational land holdings of more than 10 hectares and they are cultivating about 17.4 percent of the total cultivable land. Due to diverse agro-climatic conditions prevailing in India with four ecologically sensitive areas like Western Ghats with an average rainfall of 3,000–4,000 mm, Western Himalayas, Eastern Himalayas and Andaman Nicobar Islands, a large number of agricultural commodities are produced in India. Broadly, these can be classified into two groups - foodgrains crops and commercial crops. Because of the climatic conditions India is able to produce more with the support of available population in rural areas and became number one and number two in most of the agricultural products. India is number one in the case of milk production in world with about 239.29 million metric tons in the year 2023-24. The 70th round National Sample Survey (NSSO) revealed that 23 per cent of agricultural households with less than 0.01 hectare of land reported livestock as their principal source of income in villages. Total arable land in India is 156 million hectare in India. India right from independence adopted most of the modern cultivation/production system such as using high yielding varieties of seeds, application of chemical fertilizers, pesticides, soil management system, mixed cropping system, bringing a lot of uncultivated dry lands/areas under intensive utilization areas through bore well irrigation system and drip irrigation etc. At present bout 48 per cent (about 198 million hectares) of the total land areas in India is coming under irrigation/cultivable land areas. These are all some of the achievements made by government of India in the initial stage of development after independence as a part of poverty eradication programmes. All these helped to achieve "green revolution" during the Fourth Five Year Plan period mainly in the 'wheat producing states'.

Agricultural sector totally failed to provide/create employment to increasing population in rural areas. More than 150 million rural population, particularly youths, from agricultural based and industrially backward states like Bihar, Uttar Pradesh, Assam, Odisha, Madhya Pradesh, West Bengal migrated in large numbers to urban and semi urban areas of socially and industrially advanced states like Maharastra, Tamil Nadu, Kerala, Karnataka, Gujarat, Punjab and Hariyana in search of their livelihoods mostly in the construction and hospitality sectors as a daily cooly or contract workers. National Sample Survey (NSS) once estimated that about 42 per cent of the farmers are ready to leave agricultural sector if an employment opportunity is created outside agricultural sector such as construction, real estate, hotels, hospitality and Micro, Small and Medium industries in urban areas. According to Prof. Ramesh Chand, the NITI AAYOG Member, the gap between the farmers income and the non-farmers income is keep on increasing after liberalisation. It was Rs. 25,398/- in 1993-94 to Rs. 1.42 lakh in 2011-12. Price fluctuations are very high among the agricultural products since the agricultural products are highly perishable in nature and also due to lack of warehousing and air-conditioned warehousing facilities available in India. India is one of the largest producers of most of the agricultural commodities at global level. India is the largest producer of milk in the world with 230 million tonnes and second largest producer of food grains, fruits and vegetables. Though India is the second largest producer of agricultural products at global level about 30 per cent of what India produces is simply wasted due to lack of godown facilities, air conditioned storage facilities, food processing industries and air conditioned container facilities to transport the agricultural products to production centres to the marketing centres within India. One important point to be noted here is the Prof. Rangarajan Committee 2014 had clearly stated that about 363 million or 29.6 per cent of the population are living below the poverty line without sufficient quantity of food and 35 per cent of the school going children are suffering from malnutrition.

The Agriculture Census for 2015-16 placed the number of "operational holdings" at 146.45 million. The farmer here is somebody cultivating land without necessarily owning it. The land may be a single piece or multiple plots owned or taken on lease; what matters is the entire area ("holding") being managed ("operated") by the same person ("cultivator") alone or with others. The National Statistical Office's (NSO) recently released 'Situation Assessment of Agricultural Households and Land and Livestock Holdings of Households in Rural India, 2019' report has a different definition. The SAS doesn't focus on operational holdings as the basic unit or on the number of farmers but identifies "agricultural households." Agricultural households are defined as households having at least one member self-employed in farming and whose annual value of produce from such activity exceeds Rs 4,000. Farming or "agricultural activity" includes cultivation of crops (field, horticultural, plantation and fodder) as well as animal husbandry (dairying, poultry, goat/sheep-rearing, piggery, inland fishery, beekeeping, sericulture, etc.). Self-employment in agriculture can further be either in "principal" or even "subsidiary" status not less than 30 days during the survey reference period of six months (in this case, July-December 2018 for visit-1 and January-June 2019 for visit-2). India, as per this report, had 93.09 million "agricultural households" in 2018-19 (July-June) and 101.98 operational holdings. There is likely to be significant scope for value-addition and employment outside rather than on the farm as well – be it in aggregating, grading, packaging, transporting, processing, warehousing and retailing the produce, not to speak of supply of agri-inputs, machinery and other services to farmers. All these activities fall within the realm of agriculture, even if outside the farm. Agriculture policy should aim at not only increasing farm incomes, but also adding value to produce outside and closer to the farms. Finally, these will necessarily have to be state-specific and within them region and location-specific strategies that locate rural households at the centre of a larger vision for agricultural and economic development. Policies, moreover, that better understand farm/non-farm interlinkages and better support and enable the necessary and challenging processes and dynamics of diversification on and off the farm (Harish Damodaran, Samridhi Agarwal, Mekhala Krishnamurthy, 2021).

India has about 150 million farm households at present. Out of 140 million total farm households, 124 million households have less than 10 hectares of land. Again out of 124 million small and marginal farm households about 99.43 per cent of the farmers have less than 2 hectares of land only and again only 20 per cent of the these marginal and small farmers had availed formal bank credit facilities although government of India is keep on increasing the budget on credit facilities to the farmers from 4.75 lakh crore during 2011-2012 to 16.5 lakh core during 2021-22. Others depend on informal banks and money lenders for credit facilities. Since 80 per cent of these farmers are availing informal credit facilities with high rate of interest ranges from 18-38 per cent in the open market. They are always under stress in repaying the borrowed money immediately after harvest whatever may be the price offered by the middle men. So farmers are forced to sell their products immediately after harvest to repay the money they borrowed for agricultural operations as well as other household expenses. And also they don't have any space for storing them. This kind of attitude in economics is known as "distress sale". The middle men who is maintaining very close relationship the poor farmers wait

for a chance and fix a lower price when more farmers bring similar products for sale in the market at a time. This lower price may not be profitable for the farmers but they have no option than selling their products on the spot due to repay the borrowed money and also due to perishable nature of the products. Here only the "Minimum Support Price (MSP)" announced by the Department of Agriculture and Co-operation, Government of Indiabased on the recommendations of the Commission for Agricultural Costs and Prices (CACP) is much useful to the farmers. One of the demands of the farmers who continue to protest against the three Farm Bills 2020 brought by the government of India is that the Minimum Support Price should be continued and not be removed. The Minimum Support Price (MSP) is highly beneficial to the farmers which has been in operation from 1965-66 onwards, when government of India introduced Food Corporation of India (FCI) to procure certain listed commodities like Paddy, wheat, sugarcane, cotton and pulse items for the benefit of the farmers. Though MSP is beneficial to the farmers it did help them only to certain extent. Generally farmers used to get only 1/3 of the profit of their products and remaining 2/3 are taken over by the middle men or agents. Since farmers are getting only one third of the price of their products they are not able to repay the loan they borrowed from the informal banking sector and failed to repay the loan in time. There are incidences in India when money lenders use third degree methods to get their money back from the farmers many farmers had committed suicide. Nearly 3.5 lakh farmers have committed suicide in India during the period from 1995 to 2007 mainly due to financial problems. The nationalised banks are supposed to provide about 18 per cent of their net credit to small and marginal farmers. Unfortunately non of the commercial banks follow this regulation sincerely due to the bank regulations. According to Prof. Ashok Gulati, Indian agricultural economist, about 90 per cent of the tractor loan is provided by informal banks only. The National Bank for Rural Development (NABARD) survey 2007 has stated that about 53 per cent of the farm credit meant for Maharastra state landed in Mumbai city where there is no agriculture. Then who are the beneficiaries? Those who do agri-business/middle men cornered the this much amount of credit meant for small and marginal farmers in Maharastra. This is an example for all over India. Due to price fluctuations, influence of middle men, natural calamities like drought and flood, and cyclone farmers livelihood is always in an uncertain conditions and not getting sufficient income to sustain their livelihood. To overcome all these issues the government of India had constituted a committee under the chairmanship of Prof. Ashok Dalwai in the year 2006 to look into farmers issues and find strategies to double the farmers income in the year 2022. According to NABARD the average monthly income of the farmers in India is Rs. 8932 during 2015-16 and which increased to Rs.10218/- as per the survey conducted in 2018-19. From this one can easily understand the real poor conditions of the farmers in India.

Another area for huge investment is construction of very large godowns, air conditioned storage facilities, and establishing of food processing industries in rural areas, if possible in each and every villages. These investments in rural areas will create employment opportunities for the skilled and semi-skilled and uneducated workers in rural areas. About 30 per cent of what farmers produce is simply wasted in India due to lack of godown/storage/processing facilities. Only two per cent of what India produced is processed in India except milk. About 35 per cent of the milk is processed. In addition to the above government has to provide air conditioned containers and create world class rural infrastructural facilities to be created. These investments will being the farmers from the clutches of poverty and the vicious circle of poverty will be removed through creating employment opportunities in the villages itself. Some of the schemes beneficial to the farmers are such as: PM-KISAN SAMMAN Yojana provided financial assistance to 11.8 crore farmers. Under PM Fasal BimaYojana, crop insurance is given to 4 crore farmers. Electronic National Agriculture Market (e-NAM) integrated 1361 mandis, providing services to 1.8 crore farmers with trading volume of Rs. 3 lakh crore. Agriculture and food processing: Pradhan Mantri Kisan Sampada Yojana has benefitted 38 lakh farmers and generated 10 lakh employment. Pradhan Mantri Formalisation of Micro Food Processing Enterprises Yojana has assisted 2.4 lakh SHGs and 60000 individuals with credit linkages. One of the important areas which is identified in the Budget 2024-25 and to be developed before 2047 is farmers development. The other areas are poverty, youth development and women development. As India celebrates 77 years of Independence and enters the Amrit Kaal toward 2047, it is time to salute Indian farmers and scientists who transformed the country's food situation from "ship to mouth" in the mid-1960s to emerging as one of the largest food grain exporters in the world. Immediately after Independence, India faced food shortages and limited avenues to raise production. Its rising population and their growing food demand meant a hand-to-mouth situation for most and the country had to implore other nations to feed its people. Under the leadership of Chidambaram Subramaniam, M. S. Swaminathan and others, India did an outstanding job of bringing the Green Revolution into the country. It aimed to increase the output of agriculture to prevent shortages of food. The network under the National Agricultural Research System worked on adaptation of the improved seeds for local conditions, while a mammoth extension infrastructure was established to disseminate technologies to the farmers.Irrigation capacities were created to make precious water available. Fertiliser and other inputs were subsidised and made affordable. Outreach of formal credit was expanded, output prices were assured and procurement guaranteed. The initiatives helped in attaining self-sufficiency in foodgrain production and laid an institutional architecture for the subsequent growth and development of agriculture, pulling millions of farmers out of poverty. India's food situation has been improved from "ship to mouth" in the mid-1960s to emerging as the largest exporter of rice in the world (21mmt in FY22). The famous slogan of late Lal Bahadur Shastri, "Jai Jawan, Jai Kisan," was extended by Atal Bihari Vajpayee to include "Jai Vigyan". Now, Prime Minister Narendra Modi has extended it to, "Jai Anusandhan". Poultry and fisheries have the fastest growth, while it has been the slowest in cereal production. Government intervention is the most in cereals through the massive procurement of rice and wheat. Population Pressure: India's population at the time of independence was roughly 340 million which is likely to touch 1.66 billion by 2050, as per the latest UN Population reports, thereby surpassing China.

Thus the biggest challenge is feeding over a billion mouths. Emerging demands: As the per capita income of people increases, people are likely to demand not just more food but safe and nutritious food. So, India's agri-policies should align to these emerging demand patterns. Irrigation issues: Heavy subsidy and free supply of power for irrigation led to indiscriminate overuse of water which led to decline of water table and distorted crop choices. Also even now various areas are untouched by Irrigation facilities and are dependent on Monsoon. Environmental impacts: The indiscriminate use of chemical fertilisers, pesticides and crop specialisations favouring a few crops during the post-Green Revolution played havoc with natural resources, environment and ecology. Cost of production: In most of the crops, increase in productivity has been accompanied by an increase in average cost of production. In the next 25 years, we need to go beyond just increasing production and focus on the food system as a composite entity. This has five dimensions: (1) production, (2) marketing, (3) consumption, (4) environmental sustainability of our food systems and (5) their nutritional outcomes. We need to arrest the dramatic decline in our groundwater table, particularly in the northwest, rejuvenate our soils, and improve the air quality by stopping/reducing stubble burning and methane emissions. We need to develop carbon markets so that farmers can be incentivised to change existing farming practices that are not compatible with environmental sustainability. The digitisation of agriculture can help in this.We need to become a nation of innovators in agriculture like Israel, Holland, and the US. Making the agri-food system vibrant and competitive requires significantly augmenting farmers' incomes. "Solar as a third crop" on fields can almost double farmers' incomes quickly. On one acre of cultivated land, which grows two crops a year, farmers can have more than 400 solar panels (trees) with the help of power companies. Finally, a well-coordinated strategy between the Centre and the states is needed to ensure that agriculture

moves to the next stage of development (www.nextias.com). The Government allocated about 1.9% of the total Union Budget to the Agriculture and Allied sector, and about 1.3% was designated to support small and marginal farmers through the PM KISAN Yojana. A significant portion, about 8.3%, was directed towards major subsidies, covering food, fertilizer, and petroleum subsidies. Over half of India's arable land relies on rainfall for irrigation, directly influencing farmers' productivity and incomes. The limited access to finance and technology leaves farmers without the necessary resources to bolster productivity or combat adverse weather conditions, pests, and diseases effectively. Complicating matters further, insufficient storage, improper handling, damage by insects/pests and transportation infrastructure, resulting in post-harvest losses. This challenge is exacerbated by a fragmented and intricate supply chain involving numerous intermediaries. According to Food and Agricultural Organization,, "This issue of food loss holds critical economic, and environmental implications, with India's food loss percentage hovering at about 4.5%". The following four measures are suggested for improving the agricultural sector. Experts Enhancing India's Food Processing Sector for Sustainable Growth, Mitigating post-Harvest losses by Improving Infrastructure, Paving the way for Agri-Tech adoption, and Boosting the Agricultural Exports (economictimes.inditimes.com, 2024). The Ministry of Agriculture and Farmer's Welfare has been allocated a budget of Rs. 1.27 lakh crore. Direct financial assistance will be provided to 11.8 crore farmers under the PM-KISAN scheme. Additionally, crop insurance coverage will be extended to 4 crore farmers through the PM Fasal Bima Yojana. Furthermore, the integration of 1,361 mandis under eNAM will support trading volumes amounting to ₹3 lakh crore.

CONCLUSION

Though I have brought out a listed some major advantages supposed to take place to the farmers once farm bills are implemented, Government of India withdran these bills due to continuous protests against these Central Agricultural Bills by a section of the farmers, particularly some northern states of India like Punjab, and Haryana, where "Mandi" system is quite common.Similar protests were held in the year 2006 when government of India had started implementing Special Economic Zones (SEZ) ACT 2005 from January 2006 onwards. There were issues in acquiring lands for establishing SEZs in various parts of India in the year 2006. The main similarities observed between these two issues are that land, farmers and development. In the initial stages of implementation of SEZs, the investors, both entrepreneurs and real estate business groups, offered very huge amount of money to the farmers, even the farmers could not imagine, those who had sold their lands for SEZs development in Haryana near Delhi areas. This happened along with farmers protests against SEZs in Panjab, Haryana, Maharashtra etc. The press Medias at that time had reported a lot real life incidents of farmers who sold their farm lands for SEZs. Those farmers who sold the land, suddenly, became crorepathis and did not know what to do with such a huge amount of money even after constructing a very big multi-story house with gardens, buying cars, luxury apartments and trucks. Some of the these farmers did not know how to keep the money in the banks and simply kept them under their beds. Of course it is painful to see that farmers sold their livelihood lands for SEZs and real estate business. But the significant point to be noted here, after selling their lands, is that change of farmers lifestyle after get rid of their debt and other liabilities for ever. Overall their welfare is important for us. If SEZ Act 2005 was implemented sincerely with original vigor and spirit without any issues as per the plan, within these fifteen years India could have reached full employment level by now. SEZ is an excellent programme designed and successfully implemented by the Peoples Republic of China from 1979 onwards through 5 major SEZ areas to attract foreign investment, employment generation, income generation, increasing exports and earn more foreign exchange reserve. In fact China made achievements in all these areas. India's GDP crossed 9 per cent level during the period 2005-06 and 2006-07 only after implementation of SEZ from January, 2006. Unfortunately the subprime crisis, which affected the world economy in the year 2008 in the form of recession, struck US first and spread to all over the world and its impact also felt in India. It brought down India's growth targets after that. Though India continuously making attempts to reach higher growth level in every budget, but not achieved instead India's GDP growth has gone down to negative level in the COVID 19 period 2020. India's Public Distribution System (PDS) uses grains procured from farmers at minimum support prices (MSP), which is distributed to beneficiaries at a negligible cost. Similarly, the government subsidies fertiliser manufacturers to provide cheap fertilisers to farmers. While all of this spending does not directly reach farmers, a large part of it does benefit them. A holistic measure of central government support to farmers, should therefore, include the money spent on these heads. Centre for Monitoring Indian Economy (CMIE) data provides a disaggregated classification of spend on agriculture and allied activities under various heads. It shows that total spending on agriculture has been significantly larger than what the ministry of agriculture's annual allocation is. The tragedy of India's agriculture spending, however, is reflected in the predicament of the average Indian farmer: most of it is hand-to-mouth in nature. The proof of this can be seen in the paltry allocation to agriculture research and development (R&D). Government spending on agricultural R&D is important because, unlike in the case of industry, farmers do not have the economic wherewithal to undertake such activity on their own. Agriculture, technically speaking, is under the state list in the Constitution. However, strategic considerations of food security and the sector's political importance have made sure that the Centre spends more on the sector than what is spent by the states put together. This is unlike the case for overall government spending, where the states now outspend the centre. The Centre's share in total agricultural spending received a big boost when the government announced the PM-KISAN scheme in 2019 (Abhishek Jha, 2023).

For foster inclusive agricultural development by promoting diversification towards high-value commodities, enhancing market access through innovative approaches like contract farming and Farmers' Producer Organizations (FPOs), liberalizing trade policies to facilitate better price realization for farmers, incentivizing workforce transition out of agriculture, and boosting Total Factor Productivity (TFP) through investments in infrastructure and research. These strategies, if implemented effectively, can empower farmers, improve market efficiency, and contribute to the overarching goal of India's development envisioned in Viksit Bharat@2047 (Ashok Gulati, Ranjana Roy, Manish Kumar Prasad, Ritika Juneja, 2024). For the socio-economic development of the farmers and the agricultural development the following schemes were designed and implemented by the government of India. All these schemes definitely will take India to the next level of development of India in the agricultural sector (pib.gov.in, 2024). Pradhan Mantri Kisan Samman Nidhi (PM: PM-KISAN is a central sector scheme launched on 24th February 2019 to supplement financial needs of land holding farmers, subject to exclusions. Under the scheme, financial benefit of Rs. 6000/- per year is transferred in three equal four-monthly installments into the bank accounts of farmers' families across the country, through Direct Benefit Transfer (DBT) mode. Till now, Rs. 2.81 lakh crores have been transferred through Direct Benefit Transfer (DBT) to more than 11 crores beneficiaries (Farmers) through various instalments.

Pradhan Mantri Kisan MaanDhan Yojana (PM-KMY): Pradhan Mantri Kisan Maandhan Yojna (PMKMY) is a central sector scheme launched on 12th September 2019 to provide security to the most vulnerable farmer families. PM-KMY is contributory scheme, small and marginal farmers (SMFs), subject to exclusion criteria, can opt to become member of the scheme by paying monthly subscription to the Pension Fund. Similar, amount will be contributed by the Central Government. The applicants between the age group of 18 to 40 years will have to contribute between Rs. 55 to Rs. 200 per month till they attain the age of 60. PMKMY is taking care of the farmers during their old age and provides Rs. 3,000 monthly pension to the enrolled farmers once they attain 60 years of age, subject to exclusion criteria. Life Insurance Corporation (LIC) is pension fund manager and

registration of beneficiaries is done through CSC and State Govts.So far 23.38 lakh farmers have enrolled under the scheme. Pradhan Mantri Fasal Bima Yojana (PMFBY): PMFBY was launched in 2016 in order to provide a simple and affordable crop insurance product to ensure comprehensive risk cover for crops to farmers against all non-preventable natural risks from pre-sowing to post-harvest and to provide adequate claim amount. The scheme is demand driven and available for all farmers A total of 5549.40 lakh farmer applications were insured under the scheme since 2016-17 and Rs 150589.10 crore has been paid as claim. Modified Interest Subvention Scheme (MISS): The Interest Subvention Scheme (ISS) provides concessional short term agri-loans to the farmers practicing crop husbandry and other allied activities like animal husbandry, dairying and fisheries. ISS is available to farmers availing short term crop loans up to Rs.3.00 lakh at an interest rate of 7% per annum for one year. Additional 3% subvention is also given to the farmers for prompt and timely repayment of loans thus reducing the effective rate of interest to 4% per annum. The benefit of ISS is also available for post-harvest loans against Negotiable Warehouse Receipts (NWRs) on crop loans for a further period of six months post-harvest to small and marginal farmers having Kisan Credit Cards (KCCs), on occurrence of natural calamities and severe natural calamities. As on 05-01-2024, 465.42 lakh new KCC applications have been sanctioned with a sanctioned credit limit of Rs. 5,69,974 crore as part of the drive.

Agriculture Infrastructure Fund: In order to address the existing infrastructure gaps and mobilize investment in agriculture infrastructure, Agri Infra Fund was launched under Aatmanirbhar Bharat Package. AIF was introduced with a vision to transform the agriculture infrastructure landscape of the country. The Agriculture Infrastructure Fund is a medium - long term debt financing facility for investment in viable projects for post- harvest management infrastructure and community farming assets through interest subvention and credit guarantee support. The Fund of Rs. 1 lakh crore under the scheme will be disbursed from FY 2020-21 to FY2025-26 and the support under the scheme will be provided for the duration of FY2020-21 to FY2032-33. Under the scheme, Rs. 1 Lakh Crore will be provided by banks and financial institutions as loans with interest subvention of 3% per annum and credit guarantee coverage under CGTMSE for loans up to Rs. 2 Crores. Further, each entity is eligible to get the benefit of the scheme for up to 25 projects located in different LGD codes. Eligible beneficiaries include Farmers, Agri-entrepreneurs, Start-ups, Primary Agricultural Credit Societies (PACS), Marketing Cooperative Societies, Farmer Producers Organizations(FPOs), Self Help Group (SHG), Joint Liability Groups (JLG), Multipurpose Cooperative Societies, Central/State agency or Local Body sponsored Public Private Partnership Projects, State Agencies, Agricultural Produce Market Committees (Mandis), National & State Federations of Cooperatives, Federations of FPOs (Farmer Produce Organizations) and Federations of Self Help Groups (SHGs). As on 31-12-2023, Rs.33.209 Crores have been sanctioned for 44,912 projects under AIF, out of this total sanctioned amount, Rs 25,504 Crores is covered under scheme benefits. These sanctioned projects have mobilized an investment of Rs 56.471 Crores in agriculture sector.

Formation & Promotion of new 10,000 FPOs & Promotion of new 10,000 FPOs: The Government of India launched the Central Sector Scheme (CSS) for "Formation and Promotion of 10,000 Farmer Producer Organizations (FPOs)" in the year 2020. The scheme has a total budgetary outlay of Rs.6865 crores. Formation & promotion of FPOs are to be done through Implementing Agencies (IAs), which further engage Cluster Based Business Organizations (CBBOs) to form & provide professional handholding support to FPOs for a period of 5 years. FPOs get a financial assistance upto Rs 18.00 lakh per FPO for a period of 03 years. In addition to this, provision has been made for matching equity grant upto Rs. 2,000 per farmer member of FPO with a limit of Rs. 15.00 lakh per FPO and a credit guarantee facility upto Rs. 2 crore of project loan per FPO from eligible lending institution to ensure institutional credit accessibility to FPOs. Suitable provisions have been made for training and skill development of FPOs. Further, FPOs are onboarded on National Agriculture Market (e-NAM) platform which facilitate online trading of their agricultural commodities through transparent price discovery method to enable FPOs to realize better remunerative prices for their produce. As on 31.12.2023, total 7,774 FPOs were registered under the scheme in the country. National beekeeping and Honey Mission (NBHM): Keeping in view the importance of beekeeping, a new Central Sector Scheme entitled National Beekeeping & Honey Mission (NBHM) was launched in 2020 under Atma Nirbhar Bharat Abhiyan for its implementation in the field for overall promotion and development of scientific beekeeping & to achieve the goal of "Sweet Revolution". Some of the achievements include; Honeybees/ beekeeping have been approved as 5th Input for Agriculture. 4 World Class State of the Art Honey Testing Labs and 35 Mini Honey Testing Labs have been sanctioned under National Beekeeping & Honey Mission (NBHM) for testing of honey. Madhukranti portal has been launched for online registration of Beekeepers/ Honey Societies/ Firms/ Companies. Till date 23 lakhs bee colonies registered on Portal. 100 Honey FPOs targeted under 10,000 FPOs scheme in the country. 88 FPOs have been registered by NAFED, NDDB & TRIFED. 25 States/UTs have been covered under NBHM under MM-I, II & III. 160 Projects sanctioned under MM- I, II & III of Rs. 202.00 crores.

Market Intervention Scheme and Price support Scheme (MIS-PSS): Ministry of Agriculture & Farmers Welfare implements the Price Support Scheme (PSS) for procurement of pulses, oilseeds and copra. Market Intervention Scheme (MIS) for procurement of agricultural and horticultural commodities which are perishable in nature and are not covered under the Price Support Scheme (PSS). The objective of intervention is to protect the growers of these commodities from making distress sale in the event of a bumper crop during the peak arrival period when the prices tend to fall below economic levels and cost of production.

Namo Drone Didi: The Government has recently approved a Central Sector Scheme for providing drones to the Women Self Help Group (SHGs) for the period from 2024-25 to 2025-26 with an outlay of Rs. 1261 Crores. The scheme aims to provide drones to 15000 selected Women Self Help Group (SHGs) for providing rental services to farmers for agriculture purpose (application of fertilizers and pesticides). Under this Scheme, Central Financial Assistance @ 80% of the cost of drone and accessories/ancillary charges upto a maximum of Rs. 8.0 Lakhs will be provided to the women SHGs for purchase of drones. The Cluster Level Federations (CLFs) of SHGs may raise the balance amount (total cost of procurement minus subsidy) as loan under National Agriculture Infra Financing Facility (AIF). Interest subvention @ 3% on the AIF loan will be provided to the CLFs. The scheme will also provide sustainable business and livelihood support to SHGs and they would be able to earn additional income of at least of Rs. 1.0 lakh per annum.

Rastriya Krishi Vikas Yojana-Detailed Project Report based schemes (RKVY- DPR): The scheme focuses on creation of pre & post-harvest infrastructure in agriculture and allied sectors that help in supply of quality inputs, market facilities, etc to farmers. It provides flexibility and autonomy to states to implement projects as per the local farmers' needs and priorities from a bouquet of activities in agriculture and allied sectors. The scheme aims to fill the resources gap of agriculture and allied sectors by providing financial support to states for undertaking various activities to increase in overall growth of agriculture and allied sectors and farmers' income. Under RKVY Agri-startup Programme, since 2019-20, 1524 Start-ups have been selected and Rs. Rs. 106.25 crore released as grants-in-aid for funding the Start-ups. Soil Health Card (SHC): Soil health card provides information to farmers on nutrient status of their soil along with recommendation on appropriate dosage of nutrients to be applied for improving soil health and its fertility. The indicators are typically based on farmers' practical experience and knowledge of local natural resources. The card lists soil health indicators that can be assessed without the aid of technical or laboratory equipment. The Scheme rolls out a decentralized system of soil testing which will help in developing a nationwide soil fertility map on a GIS platform that can

easily be integrated with the real time decision support systems being developed. In order to develop the soil fertility map, Government of India has decided to conduct 5 Crore Soil Samples across the country during year 2023- 24 to 2025-26. Rainfed Area Development (RAD): RAD is being implemented since 2014-15. RAD adopts an area based approach in cluster mode for promoting Integrated Farming System (IFS) which focuses on multi-cropping, rotational cropping, inter-cropping, mixed cropping practices with allied activities like horticulture, livestock, fishery, apiculture etc. to enable farmers not only in maximizing the farm returns for sustaining livelihood, but also to mitigate the impacts of drought, flood or other extremes weather events. An amount of Rs. 1673.58 crores has been released and an area of 7.13 lakh hectare has been covered under RAD programme from the year 2014-15 to till date. Per Drop More Crop (PDMC): In order to increase water use efficiency at the farm level through Micro Irrigation technologies i.e. drip and sprinkler irrigation systems, Per Drop More Crop (PDMC) scheme was launched during 2015-16. The Micro Irrigation helps in water saving as well as reduced fertilizer usage through fertigation, labour expenses, other input costs and overall income enhancement of farmers. It also supports micro level water harvesting, storage, management etc. activities as Other Interventions (OI) to supplement source creation for Micro Irrigation. OI activities allowed on need basis up to 40% of the total allocation for North East States, Himalayan States, Jammu & Kashmir, Ladakh and up to 20% for other States. An area of 78 lakh hectare has been covered under Micro irrigation through the PDMC scheme from 2015-16 to 2022-23. Micro Irrigation Fund (MIF): A Micro Irrigation Fund (MIF) of initial corpus Rs 5000 crore has been created with NABARD with major objective to facilitate the States in mobilizing the resources for expanding coverage of Micro Irrigation. Under the funding arrangement, NABARD lends to the States/UTs at 3% lower interest rate than the corresponding cost of fund mobilized by NABARD from the market. The interest subvention on the loan under MIF is borne by Centre under PDMC. Projects with loans under MIF worth Rs 4710.96 crore have been approved so far. Loans amounting Rs.2812.24 crore has been disbursed to States of Andhra Pradesh, Tamil Nadu, Gujarat, Punjab, Haryana and Rajasthan. The Ministry provides interest subvention on the loan availed by the States which is met from PDMC Scheme. As per the Budget 2021-22, the corpus of the fund is to be doubled to Rs.10000 crores. MIF is now merged with PDMC.

Paramparagat Krishi Vikas Yojana (PKVY): Paramparagat Krishi Vikas Yojana (PKVY) aims to increase soil fertility and thereby helps in production of healthy food through organic practices without the use of agro-chemicals. The scheme is implemented in a cluster mode with unit cluster size of 20 hectares. A group shall comprise minimum 20 farmers (may be more if individual holdings are less). Farmers in a group can avail benefit of maximum of 2 ha as per provision of PKVY. 25 such clusters are converted into one large cluster of about 500 ha area to facilitate marketing of organic produce. The scheme provides for an assistance of Rs. 31,500 per ha to states, out of which i.e., Rs. 15,000 is given as incentives to a farmer directly through DBT. Sub-Mission on Agriculture Mechanization (SMAM): Sub Mission on Agricultural Mechanization (SMAM) is being implemented w.e.f April, 2014 which aims at catalyzing an accelerated but inclusive growth of agricultural mechanization in India with the objectives of Increasing the reach of farm mechanization to small and marginal farmers and to the regions where availability of farm power is low, promoting 'Custom Hiring Centres' to offset the adverse economies of scale arising due to small landholding and high cost of individual ownership, creating hubs for hi-tech& high value farm equipments, creating awareness among stakeholders through demonstration and capacity building activities and Ensuring performance testing and certification at designated testing centers located all over the country. Till date Rs. 6748.78 Crore have been released to State Governments, distributed more than 15,75,719 agricultural machinery & equipment's including Tractors, Power Tillers, Self-Propelled Machineries and Plant Protection Equipment and established 23472 nos of Custom Hiring Centres, 504 nos of Hi-Tech Hubs and 20597 nos. of Farm Machinery Banks. Looking into the unique advantages of Drone technologies in agriculture, a Standard Crop Specific Operating Procedures (SOPs) released the for use of drones in pesticide and nutrient application in public domain on 20.04.2023, which provides concise instructions for effective and safe operations of drones. From within the funds of SMAM, so far an amount of Rs. 138.82 crores have been released towards Kisan drone promotion, which include purchase of 317 Drones for their demonstration in 79070 hectares of land and supply of 461 drones to the farmers on subsidy and also supply of 1595 drones to the CHCs for providing drone services to the farmers on rental basis.

Crop Residue Management: Crop Residue Management was implemented from 2018-19 in Punjab, Haryana, Uttar Pradesh and NCT of Delhi. Its objectives include protecting environment from air pollution and preventing loss of nutrients and soil micro-organisms caused by burning of crop residue through promoting in-situ management of crop residue. In this regard, it proposes to set up Farm Machinery Banks for custom hiring of in-situ crop residue management machinery. It also aims to creating awareness among stakeholders through demonstration, capacity building activities and differentiated information, education and communication strategies for effective utilization and management of crop residue. Rs. 3333.17 crore has been released under the scheme since inception and distributed more than 2,95,845 CRM machinery. CRM is now merged with SMAM.

Agro-forestry: Agro-forestry was conceived on the recommendation of the National Agro-forestry Policy 2014 to promote plantation on farmlands. The restructured agro-forestry under RKVY is aimed to provide Quality

National Food Security Mission (NFSM): The Mission aims at increasing production of rice, wheat, pulses, coarse cereals (Maize and Barley) and Nutri-Cereals through area expansion and productivity enhancement in a sustainable manner in the identified districts of 28 States and 2 UTs (i.e., J&K and Ladakh). Other objectives include restoring Soil fertility and productivity at the individual farm level, enhancing farm level economy to restore confidence amongst the farmers and post harvest value addition at farm gate. Since the declaration of the International Year of Millets (IYM) 2023 by the UNGA in 2021, Government has taken a proactive multi stakeholder engagement approach to achieve the aim of IYM 2023 and taking Indian millets globally. 25 seed-hubs have been established to ensure availability of quality seed of latest improved varieties of Nutri cereals in the country. Millet missions have been launched across 13 states including Odisha, Tamil Nadu, Chhattisgarh, Assam, Karnataka, Madhya Pradesh, Maharashtra, Uttarakhand, Uttar Pradesh, Bihar, Himachal Pradesh, Gujarat and Rajasthan. More than 500 start-ups and 350 FPOs have been established and are operational in the millet ecosystem as of now.

Sub-Mission on Seed and Planting Material (SMSP): SMSP covers the entire gamut of seed production chain, from production of nucleus seed to supply of certified seeds to the farmers, to provide support for creation of infrastructure conducive for development of the seed sector, support to the public seed producing organisations for improving their capacity and quality of seed production, create dedicated seed bank to meet unforeseen circumstances of natural calamities, etc. For effective monitoring, efficiency and transparency covering Seed chain from Nucleus- Breeder-Foundation-Certified Seed, first phase of Seed Authentication, Traceability & Holistic Inventory (SATHI) portal was launched on 19th April, 2023. SMSP is now merged with NFSM.

National Mission on Edible Oils (NMEO)-Oil Palm: A new Centrally Sponsored Scheme namely, National Mission on Edible Oil (NMEO)-Oil Palm (NMEO-OP) has been launched by Government of India in 2021 in order to promote oil palm cultivation for making the country Aatamnirbhar in edible oils with special focus on North-Eastern States and A&N Islands. The Mission will bring additional area of 6.5 lakh ha under Oil Palm plantation with 3.28 lakh ha in

north-eastern states and 3.22 in rest of India in next 5 years from 2021-22 to 2025-26.

Mission for Integrated Development of Horticulture (MIDH): Mission for Integrated Development of Horticulture (MIDH), a Centrally Sponsored Scheme was launched during 2014-15 for holistic growth of the horticulture sector covering fruits, vegetables, root and tuber crops, mushrooms, spices, flowers, aromatic plants, coconut, cashew, cocoa and Bamboo. Major components include plantation infrastructure development, establishment of new orchards and gardens for fruits, vegetables, spices and flowers, rejuvenation of unproductive, old, and senile orchards, protected cultivation, promotion of organic farming, pollination support through bee keeping, horticulture mechanization, post-harvest management (phm) and marketing infrastructure etc. Under MIDH since 2014-15 to 2023-24 (as on 31.10.2023) an additional area of 12.95 lakh ha. of identified horticulture crops has been covered, 872 nurseries established for production of quality planting material, 1.41 lakh ha. of old and senile orchards has been rejuvenated, 52069 ha. been covered under organic practices and 3.07 lakh ha. has been covered under Protected Cultivation.

National Bamboo Mission (NBM): The Scheme is implemented in 23 States and 1 UT (J&K) through the State Bamboo Missions (SBM)/ State Bamboo Development Agency (SBDA).NBM mainly focus on the development of complete value chain of the bamboo sector. It is envisaged to link growers with consumers with a cluster approach mode. Under NBM, 367 Bamboo Nurseries established, 212 bamboo Nurseries Accredited by the State Level Accreditation Committees, 46000 ha bamboo plantations established in non-forest Government & private lands, 81 units for bamboo primary processing established, 416 units established for value addition and product development, and capacity building for 15000 persons including farmers, artisans and entrepreneurs. NBM is now merged with MIDH. Integrated Scheme for Agriculture Marketing (ISAM): ISAM supports state governments in governing the agricultural produce marketing through creation and improvement of market structures, capacity building and generating access to market information. During 2017-18, National Agriculture Market Scheme popularly known as e-NAM scheme has also been made part of the same. National Agriculture Market (e-NAM) is a pan-India electronic trading portal which networks the existing APMC mandis to create a unified national market for agricultural commodities. 1389 mandis of 23 States and 04 UTs have been integrated to e- NAM platform and more than 1.76 Crore Farmers & 2.5 Lakh traders have been registered on e-NAM portal.

Mission Organic Value Chain Development for North Eastern Region: The MOVCDNER aims at development of commodity specific, concentrated, certified organic production clusters in value chain mode to link growers with consumers and to support the development of entire value chain starting from inputs, seeds, certification, to the creation of facilities for collection, aggregation, processing, marketing and brand building initiative in Northeast Region (Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura). Since 2015-16 (as on 06.12.2023), Rs 1035.17 crore has been released, 379 FPO/FPCs created covering 189039 farmers and 172966 ha area

Sub-Mission on Agriculture Extension (SMAE): The scheme aims at making the extension system farmer driven and farmer accountable by disseminating technology to farmers through new institutional arrangements viz. Agricultural Technology Management Agency (ATMA) at district level to operationalize extension reforms in a participatory mode. Digital initiatives taken up in agricultural extension include; VISTAAR - Virtually integrated Systems To Access Agricultural Resourcs being developed as a DPI for Agriculture Extension. Apurva AI- Capturing farmer innovations- Acts as a peer to peer learning Platform and provide content for advisory retrieval through VISTAAR Bot and also for impact Assessment of schemes (AIF completed). Wadhwani- Krishi 24X7 for Realtime News monitoring, Tamil language and image-based cotton pest identification to be plugged in with FLEW/farmer profile mapping. Kisan Call Centre - Integration with VISTAAR and other IT applications and with Kisan Sarathi (ICAR) for direct contact with Agri experts. RAWE- Integration of Agri students for behavioral interaction through VISTAAR Bot and Feedback system, IMD-Weather forecast integrated through DAMU along with advisory delivery through VISTAAR, NRLM- Decentralised Extension Mechanism (Krishi Sakhi, Pashu Sakhi , Matsya Sakhi etc) - Capacity building on Digital Extension –VISTAAR.

Digital Agriculture: The scheme aims to improve the existing National e- Governance Plan in Agriculture (NeGPA) by developing a digital public infrastructure for agriculture that will be built as an open source, open standard and interoperable public good to enable inclusive, farmer-centric solutions through relevant information services for crop planning and health, improved access to farm inputs, credit and insurance, help for crop estimation, market intelligence, and support for the growth of Agri Techs industry and start-ups. AgriStack architecture has the following foundational layers: -Core registries, Base databases, Farmers Database: Farmers ID linked with land records, Geo-referencing of plots, Crop Survey, Crop planning and, Soil Mapping, Soil Fertility, Unified Farmers Service Interface for state, Pvt. Players, and Data Exchange

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