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AN OVERVIEW OF INDIAN AGRICULTURE: CURRENT DEVELOPMENTS AND FUTURE DIRECTIONS

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Abstract

Purpose- Contribution of agriculture in GDP and employment generation has been the key indicator which determines India's stand in agriculture. Majority of people in India are engaged in agricultural and its related activities for their employment and bread earning but least are being contributed in Indian GDP in comparison to services generated and manufacturing sector. There has been an attempt to find out the main issues, challenges in Indian agriculture sector and to examine the need for focus on agriculture and review basic facts on agriculture.

Methodology- This is a review research paper. Descriptive research design has been used to find out the objectives, secondary data has been used to present facts and figures and for literature review.

Findings-The issues, challenges & future of Indian agriculture sector (i.e primary sector of economy) have been explained through below mentioned factors i.e Ineffective supply chain management, Influence of unorganized money lenders, Inefficient price control by Government, Diversion of agricultural land for non agriculture purpose, Biotechnology, Exports, Food processing industry , Destroying of crops by stray animals & Natural calamities Government should keep these factors in focus while making any policy for India's agriculture sector.

Limitations –Findings are based on observations which are novel in nature and literature review. Scope of research is limited to agriculture sector focuses primarily of North India only. Horticulture and Floriculture has not been studied.

Keywords: Ineffective supply chain management, Influence of unorganized money lenders, inefficient price control by Government, Biotechnology etc.

Introduction

In India, the agricultural industry is significant. According to the International Monetary Fund World Economic Outlook (October 2018), India's nominal GDP in 2018 was $2,690 billion at current prices, making it essential to the country's economic survival and expansion. According to exchange rates, India contributes 3.17 percent of the global GDP, 17.5 percent of the world's population, and 2.4 percent of its land area. India's economy is now the seventh largest in the world. More than 55% of Indian population is engaged in agricultural and its related activities for employment which made India as Agricultural Prime Country. Since Independence (1947), India has made a significant progress in manufacturing and services sector but has not witnessed the growth as desired in agricultural sector.

Table: 1.1 Share of three sectors in India's GPD from 1950-2018 at constant price,

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Sector	1950-60	1961-70	1971-80	1981-90	1991=00	2001-10	Year-2018
Agriculture	55.3	47.6	42.8	37.3	30.9	21.8	15.87
Industries (Mfg)	14.8	19.6	21.3	22.3	23.3	24.5	29.73
Services	29.8	32.8	35.9	40.3	45.7	53.7	54.40

Source: Economic survey of India 2011-12, 2018-19 and CSO, MOSPI & https://pib.gov.in/newsite

In fact there has been observed a decline from 55.3% contribution of agricultural sector in 1950 to 15.87 % in 2018, according to economic survey Table1.1 When it comes to employment, agriculture still employ 56.1% people according to survey by CSO, Table 1.2. The largest economic sector in terms of employment to people, agriculture is still important to India's overall socioeconomic structure.

Table 1.2: Employment share for different sectors

S.no	Sectors	Employment share of major sectors (yr: 2004)	Employment share of major sectors (yr: 2018)
1	Agriculture	56.1	
2	Manufacturing	18.8	
3	Service	25.1	

Source: Central statistical organization and CRISIL,2004 & 2018

In Today's scenario , India is a significant exporter of a number of agricultural items to the global market, including tea, coffee, oil meals, rice, spices, fresh fruits, fresh vegetables, meat, and marine products. India is a significant producer of a number of agricultural goods. India is the world's top producer of milk, as well as of wheat and grains. Risks associated with agricultural production can have an impact on both farmers and end users. Coherent and integrated long-term plans and policies are needed to lower risk aversion and promote flexibility among Indian rural producers in order to increase investment and achieve a sustained growth in production.

India has been placed in a good rank when it comes to production of fruits &vegetables (Table 1.3) and is self sufficient for other agricultural crops and pulses. Approximately 92 5 of India's entire horticulture production is made up of fruits and vegetables. (ASSOCHAM, 2013).

Table 1.3: World production and % share in 2012-13 for fruits & vegetables

FRUITS			**VEGETABLES**		
Country	**Production**	**Share**	**Country**	**Production**	**Share**
China	137066750	21.2	China	573935000	49.5
Brazil	38368678	5.9	USA	35947720	3.1
India	81285334	12.6	**India**	162186567	14
Turkey	14974561	2.3	Mexico	13599497	1.2
USA	26548859	4.1	Turkey	27818918	2.4

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Indonesia	17744411	2.7	Iran	23485675	2
Philippines	16370976	2.5	Egypt	19825388	1.7
Mexico	15917806	2.5	Russian Federation	16084372	1.4
Spain	13996447	2.2	Spain	12531000	1.1
Italy	13889219	2.1	Italy	12297645	1.1
Others	270594597	41.8	Others	261467661	22.6

Source: Indian Horticulture Database, NHB, 2014

The F&V segment has been a driving force for encouragement in a healthy growth trend in Agriculture Sector. By raising rural residents' incomes, it plays a special role in the Indian economy. These crops require a lot of labour to grow, thus they provide plenty of employment prospects for the rural population. Given the abundance of employment options and potential to increase the revenue of the agricultural community, the F&V segment is arguably the most lucrative farming activity. Additionally, it has great potential to accelerate the expansion of agriculture as a whole. India offers a diverse range of climatic and geographic conditions, making it the greatest place to cultivate a variety of F&V. More than 100 countries, mostly in the Middle East, Southeast Asia, SAARC nations, the EU, and the US, import Indian agricultural, horticultural, and processed foods.

Objectives Of Study

- To identify the significant factors to understand issues and challenges of agriculture sector in North India
- To review some basic facts on agriculture
- To examine the need for focus on agriculture
- To look at policy challenges and examine some good practices

Issues & Challengesfir Agriculture Sector In India

Agriculture research has direct applications to practice and policy, offering a conceptual foundation for creating fair and sustainable reform approaches. In particular, this essay combines theory and writing that are based on ideas from Indian agriculture. The researcher has identified following factors and issues to be addressed for improvement in the agriculture sector.

Ineffective Supply Chain Management (Scm)

The dominance of small farmers, farmer illiteracy, supply chain fragmentation, lack of scale economies, poor level of processing and value addition, inadequate marketing infrastructure, etc. are all factors that affect the agriculture supply chain in India. While increasing output has been the goal, minimizing losses in the food supply chain have mostly gone ignored until very recently. Due to inadequate infrastructure, it is difficult to determine how much food is lost and wasted in India today; nonetheless, a UN assessment revealed that fruit and vegetable wastage for developing Asian countries like India is as high as 45 percent of produce (post-harvest to distribution). (Agri-logistics in India: Challenges and Emerging Solutions). Additional challenges categorized in supply chain management are

a-Cold store Chain issues- With 25 MT now available, India's cold storage capacity is only adequate for 10% of the country's fruit and vegetable production (North India having access to 60 percent of the total storage infrastructure). Currently, the private sector has a storage

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capacity of about 25 million MT, compared to 71 million MT for public sector organisations like the FCI, Central Warehousing Corporations (CWC), and different State Warehousing Corporations (SWC). According to the FCI annual report 2018, the government kept 80 million MT of food grain at its height last year, putting the shortage into perspective. According to Parwez (2013), factors like the cold chain need to be given more thought because they may help reduce losses and maintain the quality of horticultural produce.

b- Linkage and Integration issues-Limited reach of mand is a constraint in growth of agriculture. The country's whole population is not evenly distributed across the procurement system. According to the National Farmers Commission's guidelines, marketplaces should be accessible within a 5-kilometer radius, as opposed to the average farmer's journey of 12 km or more to the closest mandi and more than 50 km in NE India.

c-Many intermediaries and information asymmetry- Multiple intermediaries have resulted in the establishment of lengthy distribution channels in agriculture, which has worsened the situation for producers of perishable agricultural goods. These middlemen have increased prices by about 250 percent (above the cost of production) and exacerbated the information asymmetries already present in agriculture, particularly for non-MSP crops.

d- Infrastructural issues-Poor road and rail network in rural area has been the roadblock for the growth of agriculture sector. Farmers find it difficult to take their agricultural commodities, vegetables and fruits to Metro cities due poor infrastructure of rails and roads. Rising road transportation due to increased fuel and toll prices are another woes to this issue.

Diversion Of Agricultural Land For Non Agricultural Purposes

As rural population is increasing, the number of family members are increasing which is making the size of farms shorter as land gets divided among family members leaving small space for farming and cultivation. Due to less land availability by farmers, they are losing their interest in agriculture and utilizing fertile land for making their residence. The need of rural people to have small , big houses and farm houses worked as catalyst for conversion of agriculture land to non agricultural use resulting expansion of villages . Out of the 120 million total land households in the country, 98 million were thought to be small and marginal holdings, according to the Agricultural Census 2010–2011. Prime farmland must be preserved for agriculture, unless there are exceptional circumstances, according to the Indian National Policy for Farmers of 2007. Land with low farming yields or that is unusable for farming should be set aside for non-agricultural uses like construction, industrial parks, and other commercial development. In India, the average holding size decreased from 2.3 ha in 1970–1971 to 1.33 ha in 2000–2001. It should be highlighted that marginal farmers with less than 1 hectare account for 63% of land holdings. At the level of the entire country, marginal holdings are just 0.24 in size on average. Government should think of vertical expansion in rural area also to reduce commercial and non agricultural use of fertile land in villages, Villagers should be given legal rights to sell first floor where sufficient 20 meters roads are there in rural areas. This will prevent people not to occupy new land for constructing new houses for extended family .Also this initiative will provide double ownership rights of same properties.

Influence Of Unorganized Money Lenders

In rural India, where majority of people are engaged in agricultural activities, they have no documentation to show their creditworthiness to organized financial institutions, they are being lured by local money lenders for their financing needs and in return they charge double or in some cases four-five times of the market price of the existing interest rate from them. There are various reasons for which villagers and farmers approach local money lenders for

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finance needs .Few of reasons are need of money for their daughter's wedding, loan for education of kids, Not having land titles i.e ownership by actual cultivators, unregistered cultivators, tenants, and tribal cultivators (Mahendra ,S,Dev 2008) etc. When farmers , villagers not able to return heavy interest rates to money lenders , they are left with no option other than selling their land to them. Government is trying to enhance the net of organized financial system but still the presence of unorganized money lenders in rural India has been the cause of disturbance for poor farmers or local people. Indian government has launched various financial schemes for the benefits of farmers like Crop loans, Kisan Credit Card, Post Harvest storage loans, Agriculture Insurance at lowest rates etc but still some legal measures should be in place where unorganized money lenders be restricted to charge many fold interest rate on loans provided to them.

Inefficient Price Control By Government

There is inefficient price control by Government for approximately 22 crops as on 2018 including Kharif (sown in monsoon season) and Rabi (sown in winter season) crops. The Department of Agriculture and Cooperation, Government of India, announces MSP for before the sowing season based on the recommendations of the Commission for Agricultural Costs and Prices (CACP). Through the PDS system, the government has been purchasing close to one-third of all the rice and wheat produced in India, but its purchasing power is limited when it comes to other grains, fruits, and vegetables (both of which are highly perishable). MSPs become inefficient for the bigger agricultural population as a result.(Christopher B. and Emelly, (2014). There are two aspects with regard to price control by Government . One is to control price inflation and ensure food for all Government buy the necessary food commodities through its agencies like FCI (food corporation of India) from farmers by paying them MSP (minimum price support) but that is not sufficient return for farmers .Farmers are not allowed to store and sell few necessary commodities like wheat etc as Government need to ensure food for all. This is right decision by the Government .Second aspect is that when entrepreneurs are free to sell goods produced by them at their decided price then why its not there for farmers. If they cannot be allowed to sell their commodities and agricultural produce, they should be given reasonable price by the Government through subsidies.

Access To Water And Irrigation

Agriculture in India still depends on the weather, and irrigation is a challenge as well. However, all types of farmers now have more access to irrigation. It is highest for marginal farmers, followed by small farmers, claims Bardhan, P. (2000). Small farmers now irrigate 51 percent more land than they did in 2000-01, up from 40 in 1980-81. For large farms, however, it increased from 16 to 31 percent throughout that time. Since the introduction of pumps in the early 1960s, groundwater irrigation has increased in popularity reported by Sivsubramaniyan (1997). Today, groundwater supplies provide water to almost 50% of India's irrigated land. The benefit of groundwater irrigation has been severely weakened by the fall in groundwater level, water logging, and the lack of payment for services, particularly the subsidy on pumping costs. The development of groundwater irrigation has also been linked to a decline in the effectiveness of tank systems and other surface irrigation systems. However, it should be highlighted that while small farmers must rent water, large farms benefit from less expensive sources like canals. For major farmers, canal irrigation accounts for about 40% of their irrigation needs, compared to less than 25% for small and marginal farmers (NCEUS, 2008).According to Bansal(1994) In unirrigated areas of low rainfall (<400mm) , generally crops are grown in mixtures or in intercropping .These mixtures consist of 2-7 crops and their main aim is to safe guard against complete crop failure.

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Few crops like rice consume more water and has long term water depletion affects on ground water available. Government has kept a cap of sowing this crop once for year in some States to control and maintain ground water level. But farmers have to suffer due to this decision. This problem can be sort out in future through research on rice crop by finding Gm (Genetically modified) crop which consume less water. Natural canals in some North Indian States run on rain water available and are having water evaporation .This can be fixed by making canals cemented .Government has started working aggressively on such projects. It should be done by all States in times to come.

Exports Challenges

The expansion of some commercial crops has the potential to significantly boost agricultural exports and hasten the establishment of agro-based companies. Because it provides job and food security to the majority of the population in the nation, agriculture not only helps the economy develop overall but also helps to eliminate poverty, making it one of the Indian economy's most inclusive growth sectors. The Five Year Plans also show that a strategy to faster, more inclusive sustainable growth includes a strong emphasis on agricultural development. To focus on growth of agricultural export, Indian farmers need to focus on quality crops, they need to follow international standards when it comes to use of pesticides but in absence of pesticides productivity falls down .That is the reason farmers are not willing to leave excessive use of pesticides, urea etc. Another challenges are competition from neighboring countries and appreciating international currency i.e dollars in comparison of Indian rupees which is making dent to India's agricultural exports .International Buyers go to another neighboring countries for purchase of agricultural commodities.

Future Of Gm Crops Through Biotechnologies

GM crops are the way of the future in agriculture. The phrase "biotechnology" refers to a broad variety of scientific methods and goods that can be applied in different ways to increase and maintain the productivity of forests, fisheries, livestock, and agricultural crops. (Rao and Dev, 2010). A development of conventional agricultural practises is biotechnology. People have frequently improved agri-food production by using their knowledge of plants during the past 10,000 years. Biotechnology, or genetic modification (GM), is the most recent advancement in agricultural practises. Plant breeding was once the only method used by farmers to enhance or remove particular genetic features from a plant. Over numerous generations, those with good traits are chosen. Today's crops and livestock are the results of conventional processing. For instance, corn today does not resemble corn from 100 years ago due to plant breeding. Even yet, it frequently required multiple growing seasons to create a plant that displayed the desired features. Eventually, farmers were able to cultivate crops that could withstand drought. One cannot preclude the potential that other features may also transmit during traditional processing. (chopra & Kamma, 2016)

Food Processing Industrirs

If India needs to enhance agricultural contribution in GDP or has aspirations to be leader in the sector then food processing industry needs to be developed across the country. The sixth-largest food and grocery market in the world is in India, with 70% of sales coming through retail. Additionally, one of the biggest sectors in India's retail industry, which was worth USD 490 billion in 2013, has been food.. One of the largest sectors in India, food processing contributes 32% of the nation's total food market and is rated fifth in terms of production, consumption, export, and projected growth. Around 14% of the manufacturing Gross Domestic Product (GDP), 13% of India's exports, and 6% of all industrial investment are contributed by it. By 2018, the Indian food service sector is anticipated to generate US$ 78

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billion. The market for gourmet foods in India is now expanding at a 20% Compound Annual Growth Rate (CAGR). A low rate of technological advancement on the one hand and increasing business inefficiencies on the other, say Kumar & Basu (2008), prevent India's food processing industry from reaching its full potential. For the Indian food business to advance more quickly technologically, imports must be promoted alongside R&D. However, the organisational structure as well as different institutional and economic factors influence technical potential. Therefore, significant institutional reforms must be implemented side by side in order to significantly reduce inefficiencies. Although it is still in its infancy, India's online meal ordering industry is expanding exponentially. In India, the organised food industry is worth US$ 48 billion, of which US$ 15 billion goes to food delivery. The organised food industry has enormous potential and a bright future thanks to participants in online meal delivery like FoodPanda, Zomato, TinyOwl, and Swiggy that are growing their businesses through partnerships. The Ministry of Food Processing Industries has created the Vision Document-2012 in an effort to support the food processing sector, raise the level of processing, and take advantage of the potential domestic and global markets for processed food products. By increasing the amount of perishables processed from 6% to 20%, value addition from 20% to 35%, and share in the global food trade from 1.5% to 3% by 2020, the study projects a trebling of investment in the processed food business. The Ministry estimates that in order to reach these goals in 2020, an investment of Rs 100,000 crore (US$ 14.67 billion) will be needed.

Destroying Of Crops By Stray Animals

Crops destroying by stray animals and birds like nearby village pigs, donkeys , buffalos , monkeys and eagles etc in farms affect the production of agricultural commodities which results into loss of farmers. Farmers have to sort out at their own for such problems .No major Government help has been given to farmers. Farmers have to spend a lot on fencing of farms at their own to fight for such problems.

Natural Calmities

Natural calamities like drought, flood, heavy rains and other things like disease, pest, insects problems affect the production of agricultural commodities which results into loss of farmers. More than 10,000 different species of insects, 30,000 different species of weeds, 100,000 different diseases (caused by fungus, viruses, bacteria, and other microbes), and 1,000 different species of nematodes harm the world's food plants (Hall, 1995; Dhaliwal et al., 2007). Crop losses have constantly increased in spite of a number of insect management strategies being used (Dhaliwal and Koul, 2010). The severity of insect problems is greatly impacted by climate change (Ramamurthy et al., 2009).Agriculture in Rajasthan, Bihar, some part of UP are affected by such problems which is a challenge for farmers. Rivers like Ganga, Yamuna flood nearby areas in some part of country due to which huge losses are borne by farmers.

Table 1.4. Global loss (%) for categories of pests in major crops

Crop	Animal Pests	Weeds	Pathogens	Viruses	Total
Cotton	12.3	8.6	7.2	0.7	28.8
Maize	9.6	10.5	8.5	2.7	31.3
Potatoes	10.9	8.3	14.5	6.6	40.3
Rice	15.1	10.2	10.8	1.4	37.5

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Soybean	8.8	7.5	8.9	1.2	26.4
Wheat	7.9	7.7	10.2	2 .4	28.2
Average	10.8	8.8	10.0	2.5	32.1
Source: Oerke (2006)					

Rising Labour Cost

The rise in labour cost in agriculture has also contributed creating woes to Indian farmers. Labourers from state like Bihar and eastern UP come for temporarily employment in Haryana , Punjab and western UP . There are many Government schemes like MNREGA scheme which provide rural employment of minimum 90 days to labourers and and rise in income level of labourers encouraging them to look for employment in their home states and not to work .

Conclusion

The Indian agriculture can be well understood by studying the factors i.e, Ineffective supply chain management, Influence of unorganized money lenders, Inefficient price control by Government, Diversion of agricultural land for non agriculture purpose, future of Gm crops through biotechnologies, ,exports, Food processing industry, Destroying of crops by stray animals , Natural calamities and Rising labour cost .Government should keep these factors in focus while making any policies for agriculture sector. India needs to work out the best and optimized solutions for these significant factors which came out by the research and only then India would be able to lead the Global agricultural economy. Newly launched scheme of central Government in 2019 providing Rs 6000 annually to farmers having less than 5 acres and providing subsidize neem coated urea has been seen as good move to address problems of Indian farmers. The research, education, extension, irrigation, fertiliser, laboratories to analyse soil, water, and commodities, as well as warehousing and cold storage, are all hugely important to the agriculture and food sectors. A portion of the resources for public investment would be generated by rationalising subsidies and improving their targeting. The yields in different states vary greatly. When compared to the best in the world, even the best states produce varied crops at far lower yields. This offers plenty of potential to boost production by closing the yield gap as much as is practical within the climate zone. As a large portion of farmed land is still unirrigated, providing irrigation can significantly increase productivity. A financial investment in basic research would be required to alter the production function. State cooperation should be sought in order to establish a national single market for agricultural products. With significant private sector support, contract farming has become a new vehicle for fostering rural economic growth that is supported by the state. (2015) Sreymom and Pirom Cook and Shepherd (2001). The government should investigate why the agriculture sector is being prioritized in light of the aforementioned issues.

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