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Problems And Prospects Of Agriculture Based Industries In India.

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Abstract:

Agriculture-based industries hold significant importance in a country like India, where a large portion of the population depends on agriculture for livelihood. These industries are essential not only for processing and value addition of agricultural products but also for promoting rural development and employment generation. This research paper examines the current status, potential, and major challenges faced by key agriculture-based industries in India, including textiles, sugar, food processing, paper and pulp, fertilizers, and agricultural machinery. The study identifies critical issues such as seasonal supply of raw materials, lack of modern technology, limited capital availability, marketing difficulties, complex labor laws, and infrastructural inadequacies. Despite these challenges, the paper highlights the vast untapped potential of these industries to reduce rural-urban migration, address disguised unemployment, uplift rural economies, and contribute to sustainable economic growth. The research emphasizes the urgent need for integrated policy support, investment in technology, infrastructure enhancement, and institutional reforms to realize the full potential of agriculture-based industries in India.

Keywords:
Agriculture-based industries, Rural development, Food processing, Textile sector, Employment generation, Policy support, Sustainable growth

Introduction:

Agriculture based industries are those industries where a set of techno-economic processes applied to all agricultural farm, livestock, aquacultural, and forest products for conservation, handling, and value-addition in order to make them viable as food, feed, fibre, fuel, or industrial raw materials. These industries have both direct and indirect linkage with the agriculture and its associated activities. It includes a wide range of industrial, manufacturing, and processing activities based on agricultural raw materials, as well as activities and services used as agricultural inputs. Examples of agriculture-based industries are textiles industries like (cotton textiles, woollen textile, silk textile, synthetic fibres, jute textile), sugar, paper, vegetable oil, cereal, pulse milling, fruits and vegetable processing, beverages like coffee, tea and cocoa, fish, poultry, and egg

products, meat industry, bread, biscuits and bakery products), apiculture, fertiliser industry, pesticide industry, agriculture tools/machinery industry etc. The degree of processing varies significantly, from cleaning and grading fruits to chemical alterations that create a textural flavour food.

Agriculture based industry are dependent on agriculture for their raw material and on the same basis they can be divided into two categories:

1. ***Food Processing Industries:*** Food processing refers to any process in which a raw product from agriculture, dairy, animal husbandry, meat, poultry, or fishing is transformed through a process (involving employees, power, machines, or money) so that its original physical properties change and the transformed product has commercial value and is suitable for human and animal consumption. It also involves the process of adding value to products by methods such as preservation, the addition of food additives, drying, and so on, in order to effectively preserve food ingredients, increase their shelf life, and improve their quality.
2. ***Non-Food processing Industries:*** They include processing of those products that are not consumed by humans and animals rather used by them for other purposes. Example is textile industry, paper industry etc.

Agriculture based industry can broadly be classified into following four categories:

1. ***Agro-produce Processing Unit:*** They are involved in manufacturing and preservation of perishable products and utilisation of by products for other uses.
2. ***Agro-produce Manufacturing Unit:*** They engage in manufacturing of new products from raw material. The process causes change of products' characteristics for example processing of sugar from sugarcane.
3. ***Agro-inputs Manufacturing Unit:*** These units produce products that are helpful in increasing the productivity of agriculture. They include machines and chemicals used in the agriculture. For example, tractor industry, urea factory etc.
4. ***Agro Service Centres:*** These are service centres and workshops that are engaged in repairing, and servicing of the products manufactured by the agro input manufacturing units.

Agriculture based industry is age old concept for Indian soil as it could be traced back to the earliest civilisation of the country. Prior to British administration, villages in the country were self-sufficient in terms of fundamental requirements, due to agriculture, crafts, and cottage industries. When the British intended to make India a large market for their mill-made goods, they destroyed handicrafts and rural businesses. Several rural businesses lost their bases, and craftspeople struggled to survive. The industrial sector had started taking shape of separate commercial activity during British era. Significant steps are taken by the government since independence to provide a boost to industrial sector but those steps fail to fulfil the purpose of rural development as all development operations conducted in the name of planning and growth were imbalanced. They only aided in the development of large-scale enterprises and infrastructural facilities, which accelerated urbanisation.

Literature Review

(Kachru, 2010) presented in his paper an overview of agriculture-based industry's growth history, including the importance of R&D, recent trends in crop-specific agro-processing industrialization and difficulties, export patterns, SWOT analysis, and potential thrust areas for attaining a stronger role for this sector in the national economy.

(Paramasivan, 2016) discussed in his paper the impact of agro based industries on different sectors of rural population and contribution of the sector in the development of the country. He concluded that there exists a vast potential of export of agro based products in future causing huge volume of foreign exchange to land in the country but that needs specialisation and effective steps for promotion of the sector.

Gusev (2021) discussed in his paper the importance that innovation, digital technology, robotization and use of new technology bears in the development of agriculture-based industry along with agrarian society. High performance metrics should be prioritised in the agriculture industry. It is vital for enterprise managers to

grasp the requirement for production activities that are focused on the innovation vector of existing and future development.

Zhilyakov (2020) devoted his paper for the study of development of horticulture products markets. He focussed on need of state's support to agricultural organisations for making the country self-sufficient by arranging advance and expensive technologies used in fruit and vegetable industry. The paper advocated that a critical component of the industry's steady expansion is the efficient operation of the whole production chain, from seed production and equipment to storage, processing, and final sales.

Chatar et. Al (2020) discussed in their paper the impact of agro-based industries on Indian economy, and examined the issues, problems, and challenges faced by agro based industries in India. The paper supports promotion of agro based industries as they can solve the problem of unemployment in rural areas, disguised unemployment in agriculture sector, rural urban migration on large scale, and would result in reduction of inequality across sectors and regions.

Objectives

1. To evaluate the problems that major agriculture-based industries are facing in India.
2. To evaluate the prospects of major agriculture-based industries in India.

Discussion

Need of Agro-based Industries

Economic

Agriculture based industry has a huge untapped potential in India which if tapped would contribute in the economy of the country tremendously. Setting up of agriculture-based industry near to local raw material producing area that is rural India would cause dissemination of industrial from urban to rural space. This would lead to increase in demand of raw material which farmers currently struggle to sell, processing of raw into finished one needs engagement of workforce that too would come from rural area itself resulting into increase in purchasing power of the locals and demand of the finished products. Although only little amount of the finished product would be absorbed in the local, rest would travel to urban and if possible, to other country also. This whole cycle would cause decrease in employment, increase in income and standard of living of rural India ultimately contribute in upliftment of rural economy.

Industries at rural areas would reduce the wastage of raw material and further motivate the farmers to increase their production by increasing areas under cultivation, increasing productivity and adopting new advance farming technology.

Social

One of the major causes of backwardness of rural society is lack of financial strength. Sections of population that are deprived in rural society includes landless labours, women, schedule caste and schedule tribe. This section of population would get new economic opportunities and they would not be left with only single option that is to do labour at the fields of the landlords but they can work at industry too. Apart from rural society the industries would also have significant impact over urban society. Currently, Indian cities are facing the problem of over-population mainly due to rural-urban migration which would be checked by establishment of agriculture-based industries in rural are India.

General Challenges in agriculture related industries.

Some of the challenges that are common among several agriculture related industries are as follow:

- Still more than 50% of arable land in India is dependent over precipitation from monsoon and western disturbance. Monsoon is highly erratic thus sometimes hit the agriculture adversely.
- Lack of around the year supply of raw material. This is the effect of another challenge that is lack of cold storage facility. There are no reliable cold chains, which are necessary for temperature sensitive foods like fruits & vegetables, ice creams etc. Seasonal supply of agricultural produce may result in underutilization of unit capacity since the unit will not be operational all year.
- Tendency of rural rich population not to invest capital over new enterprises because of risk factor imbibed in it. The risk became major problem due to lack of proper guidance, training of modern and sophisticated agro-industries.
- Establishment of green field industry need large amount of capital which is not readily available. This is tackled by financing agencies which have lower presence and interest in rural sector. The sector has found itself in a deadlock in which huge corporations do not see investment as acceptable owing to the tiny size of the market and small-scale manufacturers cannot afford modernization.
- Majority of population has low level income thus could not afford processed food making the market size small which is the most advantageous portion of India. Cost of the product is high due to quality checks and packaging cost. Despite having purchasing power, Indian families prefer to consume freshly prepared home cooked food rather than processed one.
- Due to unscientific application of fertilisers and pesticides raw material failed quality check done during procurement by the industries. This further deepens the problem of shortage of raw material.
- Inadequate transportation medium and dilapidated roadways condition deteriorate the condition of perishable items. There is lack of refrigerated trucks in India which could carry perishable items from long distance increasing the raw material base of the industry.

Challenges in Major Agriculture based industries in India.

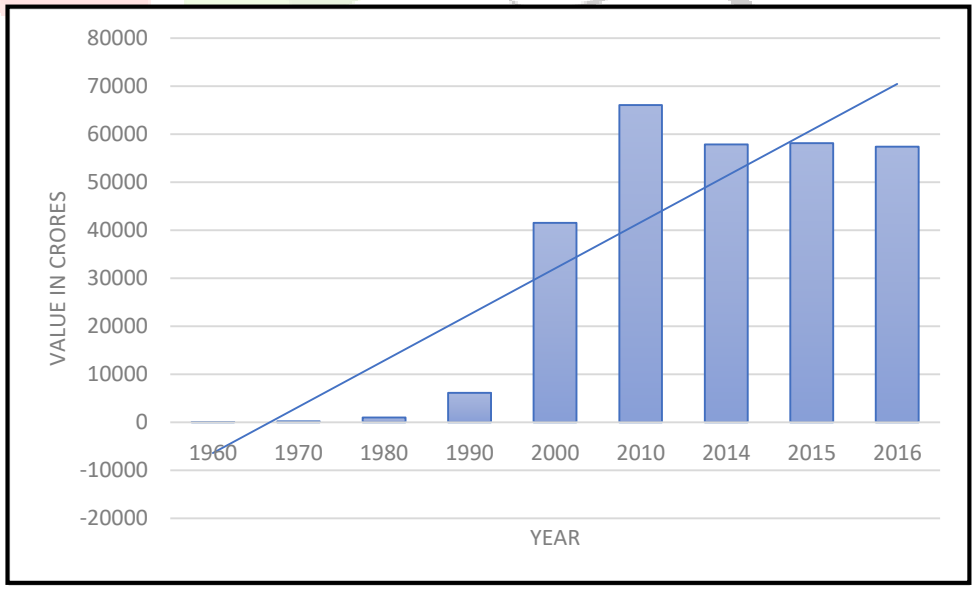
Textile Industry:

Textile industry final product is cloth that is one of the three basic needs of living human life. The textiles and apparel industry in India is the second-largest employer in the country after agriculture and providing employment to 45 million people directly and about 10 million people are engaged directly or indirectly. The industry comprises more than 2% of GDP of the country, accounts for 13% of industrial production, and 12% of country's export. Although whole of the sector is not made up of natural fibres rather it also constitutes man-made fibres like polyester, and viscose. India's textile and garment industry is second largest after China but still there is more potential in the sector which the country is yet to be harnessed. The potential is not harnessed till now because of some challenges that the sector is facing. The Indian textile industry is extremely fragmented, with the unorganised sector and small and medium-sized businesses dominating. The presence of a significant number of small and medium-sized manufacturing units, along with the scarcity of major firms, makes it difficult for the sector to adopt advanced, efficient, and costly machinery, resulting in inefficient use of available natural resources. There are over 200 labour laws, including a quarter of Central Acts. Indian producers find it cost-effective to use relatively capital-intensive production techniques and often produce fairly capital-intensive products. The Industrial Disputes Act (IDA) compels companies with 100 or more employees to get government approval before retrenchment or layoffs. This authorization is rarely granted. The Industrial Employment (Standing Orders) Act of 1946 compels employers in enterprises with 100 or more employees (50 or more in some states) to obtain approval even for reassigning a worker from one duty to another. Furthermore, the Trade Unions Act permits any seven employees to create a union, using a significant percentage of the firm's managerial resources in dealing with many unions inside itself. Limited access to cutting-edge technology (particularly in small-scale enterprises) and failure to reach global standards in a highly competitive market. Lack of advanced technology not only produces backwardness in the worldwide market, but also

difficulties for domestic companies if foreign cheap product begins to be dumped in the country via import. Climate change and global warming are also the challenges that the textile industries based on natural raw products are facing. Climate change has a significant negative impact at the 1% threshold on the area sown by producers because of the difficulties that cotton farmers have had in recent years in identifying the effective start of rainy seasons and in repetitive sowing. Foreign direct investment is a major component in developing countries that enhances manufacturing capacity in any industry since it delivers advanced technology, adequate finance, and already established marketing abilities with a presence in several countries. Despite 100 percent FDI is allowed via automatic route, the textile sector has been unable to attract it. This is owing to the intricacies of industry legislation, delays in approvals by government officials, the difficulty of doing business, and the other considerations mentioned above.

(a) **Cotton Textile Industry:** Since about 1500 BC, India has enjoyed a global monopoly on cotton textiles. Indian fabric was in high demand in the European market during the Middle Ages. For example, Dhaka's muslins, Masulipatnam's chintzes, and Calicut's calicos are world famous. However, the introduction of new mills during the Industrial Revolution, as well as British India's discriminating policies, contributed to its demise. The current cotton textile industry is an indigenous industry, having been founded and grown mostly on Indian capital and entrepreneurship. Currently India is largest producer of cotton with annual production exceeding 6million tones of production but it slips to second position when it comes to cotton textile. The sector could perform much better if some of the challenges are tackled effectively. Good textile quality necessitates long stapled cotton, which is imported from foreign nations owing to scarcity in India, raising the cost of input. The price is hastened further by the usage of outdated machinery. Labour regulations limit the liberal expansion of companies by making businesses responsible for the wellbeing of their employees rather than making revenue. The high cost of production outperforms Indian products on the global market, thus discouraging producers from investing. This created a vicious cycle in India's cotton textile business. Apart from higher costs, the functioning of the manufacturing units is also non continuous due to frequent failure of power supply. Despite the challenges there are plenty of possibilities for cotton textile industry as it is most favoured textile for the climatic conditions of India thus would be in demand for all the time.

Figure 1: Growth in Value of Cotton Textile Export



Source: The Economic Survey 2017-18.

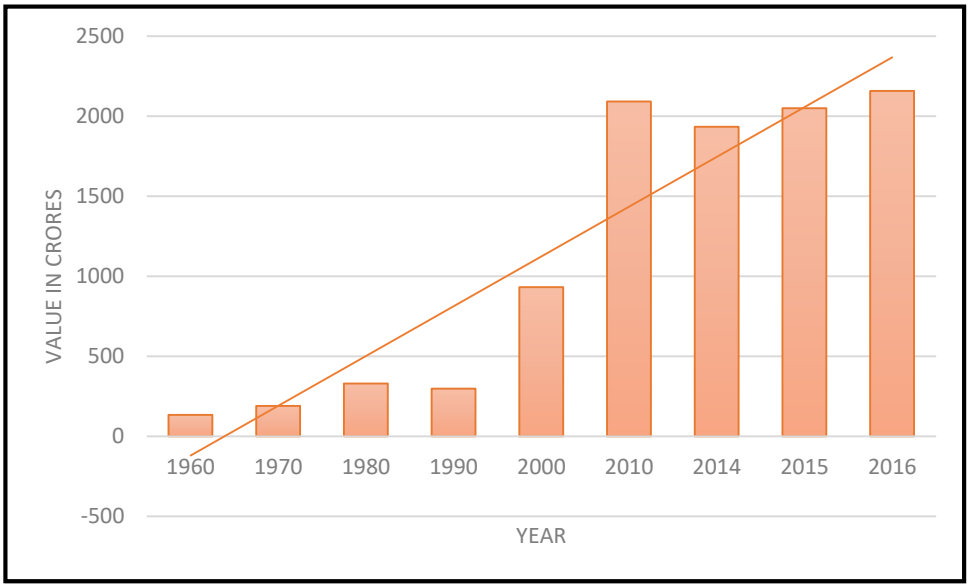
Trend of using cotton in place of synthetic fibres has raised in first world countries as it is natural and suitable for human skin. Therefore, demand at international level would also be increasing in the coming times.

(b) **Wollen Textile Industry:** Among the textile industries woollen industry is smaller than cotton and man-made textile. Wool is obtained majorly from sheep in India and population of sheep in India is third largest despite that in woollen textile it stood at seventh position in the world. There is demand supply gap in woollen sector and lack of raw material compels India to import wool from Australia, New Zealand etc. Encroachment of agricultural land and human settlement in pasture lands makes shortage of fodder for sheep. Therefore, shepherd have to migrate continuously from one location to another and this practise in unsuitable for any organised sector. Woollen textile sector has gained least attention by the authorities for their growth. Indian woollen textile industry is mainly domestic market oriented which is not huge as cotton market because India is tropical country with short summers in Northern part and absence of any winter season South to Vindhyas. Indian woollen textile industry face hardship in competing with international enterprises due to use of traditional technology and whole method ranging from extraction of wool to transforming it into textile. There is rarely any institute that could provide guidance and expertise along with innovation in the woollen textile sector.

(c) **Jute Textile Industry:** After cotton textile, jute industry is the second most significant textile industry in India. Nearly 85% of the jute in world is concentrated in the Gangetic delta region and more than 60 % of the jute in the world is produced by India alone. The industry supports around 4 million farm families with around 3.7 lakhs industrial workers engaged. The Jute industry in India is one of the major producers of product, and the manufacturing process includes cultivation of raw jute, processing of fibres, spinning, weaving, bleaching, dyeing, finishing, and selling of both raw jute and its completed goods. Major challenge that jute is facing is competition with cheaper synthetic substitute that is decreasing overall demand of jute in the world. This sector also employs old machinery to manufacture jute yarns and fabrics. The machines' effectiveness is just 80% due to the utilisation of extremely old crude technology. Due to frequent failures, faulty and poorer quality items are manufactured, and at greater prices than those from Bangladesh and China. Mills were established in India at very early times and since then due to very marginal profit and non-farsightedness of the owners, they rarely have gone through modernisation and automation on the other hand mills established in Bangladesh are new lased with recent technology, therefore their product are both better in quality and low in price. Lack of raw material made factories function in under utilised conditions. There are infrastructure bottlenecks that challenge growth of jute industry like power, transportation and capital. West Bengal is largest producer of the jute textile but the state is under high influence of idea of communism strengthening the workers union organisations whose leaders call for strikes very frequently sometimes only for their personal gain. This causes heavy loss to industry and creates an unreliability among the procurers.

The industry is gaining strength with the increasing global awareness about the marine, soil and on burning air pollution that artificial synthetic fibres would cause and steps taken by international organisations and summits to adopt biologically degradable substances for packaging and transport purposes along with other fields. According to the graph the growth in export of jute products till now is very high.

Figure 2: Growth in Value of Jute Textile Export



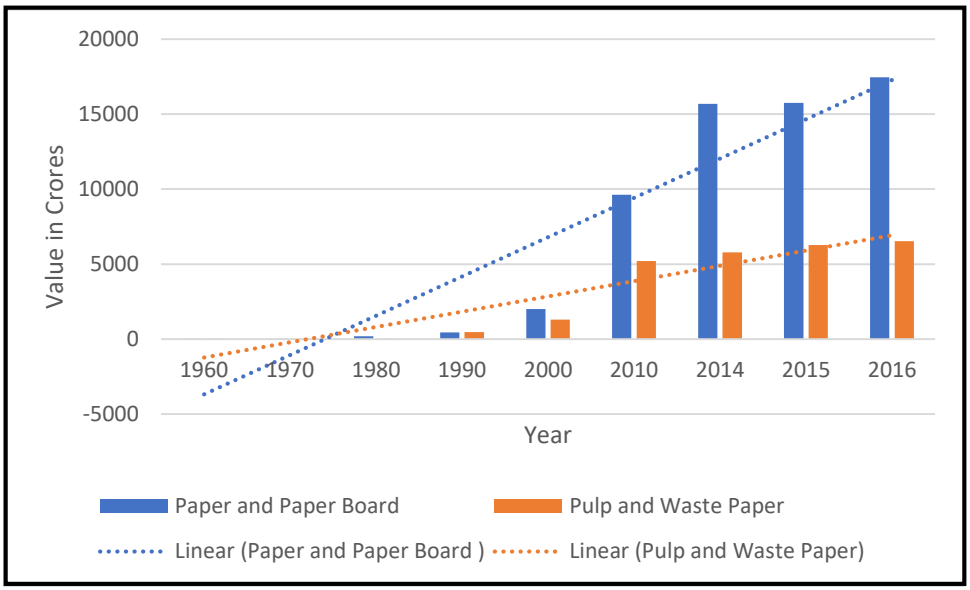
Source: Economic Survey 2017-18.

Therefore, the international demand or demand in developed countries that can afford costly jute textile is going to increase considerably.

Pulp and Paper Industry:

The pulp and paper industry comprise companies that uses wood and other raw materials like bamboo, sabai grass, bagasse, etc to produce pulp, paper, paper board etc. Paper and pulp industry is one of the largest manufacturing sectors in world but in India it lacks far behind. The per capita paper consumption in India at a little over 13 kg, is way behind the global average of 57 kg. At the current low rate of consumption, India uses just 2.5 percent of the world's paper and paper board, but accounting for around 17 percent of the world's population. In India, there is a significant gap between supply and demand for paper. With the growth of education and literacy, the demand for paper is certain to rise and is anticipated to double over the next ten years. In India, 40% of total paper production is made from hardwood and bamboo fibre, 30% from agriculture waste, and 30% from recycled material. 2 million tonnes of paper are utilised for publications and newsprint. There are 1.2 million tonnes of newsprint produced, with the remainder purchased from other producers. This means that around 40% of newsprint is imported from outside the nation. In terms of pulp imports, India imports around 2 million tonnes of pulp wood and waste paper for newsprint. India needs to import the paper and pulp because of following challenges that restrict it to become self-sufficient in production of paper and pulp.

Figure 3: Growth of Value of Paper, Paper Board, Pulp and Waste Paper Import.



Source: Economic Survey 2017-18.

According to the graph it could be comprehended that import pulp, waste paper, paper and paper board had increased but growth rate of paper and paper board is far more than that of pulp and waste paper which means that final product is reaching to the country at larger scale and raw material is imported at smaller scale. There is need to shift the trend of import of paper and paper board to pulp and waste paper.

Out of total production of paper and paper board only 15% is derived through recycled material as compared to 30-85% in different nations. Size of Indian paper mills is small (average 10000 tones) as against 50000 tones in South East Asia and 85000 tones in Asia-Pacific. There is a need to create new innovative techniques for raw material utilisation, as well as different grades of acceptable pulp and the design and manufacturing of relevant equipment. To satisfy demand, the sector must explore for alternative raw materials. There is urgent need of research and development in the sector for evolution of new techniques and methods that are suitable for Indian conditions. Apart from innovating new technology, focus should be given in increasing the supply of raw material to substitute the import. Bamboo and sabai grass are natural resources that are affected by the climate change, global warming and changing interest of the producer(farmers). Along with innovation in the technology of processing of the raw material there should also be efforts for biological modification of the raw material to increase its productivity, shorten its growing period etc. Use of unconventional raw material like wheat bran, rice straw, eucalyptus etc need modification of existing processing unit or installation of new processing and control equipment. Cost of production that is initial input cost is high in this sector because of expensive capital equipments, extraction of royalty fees by state government for forest land etc. This makes the sector little less attractive to new investors and also demotivated the existing owner of the mills to upgrade their machineries. Due to required high cost of investment and low rate of realisation, small scale industries sometimes fail or run with bare minimum profit. High cost of investment is needed not only for input and purchase of capital machinery but it is also needed for treatment of effluents that is released by the factories. With the passage of time rules and regulation regarding environmental pollution have become stringent exerting whole responsibility over the industries. To overcome the challenges, there is need to enhance the whole chain of recycling the waste paper, increase diversity of raw material to be used for paper making for example use of bagasse should be encouraged as the large quantity of bagasse is used (wasted) as fuel in the sugar industry and is not made available to the paper industry. Promotion to agroforestry and social forestry would help in completing the raw material need of the industry.

Sugar Industry:

Sugar industry is labour intensive at all the stages that is from farming the sugarcane to making of the sugar and alcohol. This is again a huge sector engaging nearly 50 million farm families with about 5 lakhs labour engaged directly in the industry. Sugar industry have multiple linkages with various uses of its by-

products therefore promotes allied industries. Recently, importance of sugarcane has increased significantly since blending of alcohol produced from the by-product sugar industry with petrol has begun. Another by-product that is bagasse is used by paper industry as raw material and by the sugar industry itself as fuel.

The sugar industry in India is beset by a number of critical and complex problems that needs quick attention and sensible solutions. Although India has the most sugarcane farming area, the output per hectare is relatively poor when compared to other of the world's main sugarcane producing countries. India, for example, has a yield of just 64.5 tonnes per hectare, compared to 90 tonnes in Java and 121 tonnes in Hawaii. As a result, overall output is poor in comparison to capacity or potential. Sugarcane competes with a variety of other food and cash crops such as cotton, oil seeds, rice, and so on. As a result, the acreage accessible for sugarcane cultivation varies, and overall sugarcane production fluctuates. This has an impact on the availability of sugarcane to mills, and sugar output fluctuates from year to year. Sugar production is a seasonal phenomenon, with a brief crushing season ranging from 4 to 7 months every year. The mills and their employees are idle for the rest of the year, causing financial challenges for the industry as a whole. In India, the average rate of recovery is less than 10%, which is relatively low when compared to other major sugar producing countries.

In Java, Hawaii, and Australia, for example, the recovery rate is as high as 14-16%. The production cost of sugar in India is one of the highest in the world which when supported by inefficient technology, uneconomic process of production and heavy exercise of excise duty becomes globally uncompetitive due to raised cost. Most sugar mills in India are small, with capacities ranging from 1,000 to 1,500 tonnes per day, making large-scale production uneconomic, and many mills in India are economically unviable but nonetheless operational. Small size of industry has small margin of profit due to which they find themselves unable to adopt new set of technology and makes the problem further grieve. Demand of sugar in India is low as per capita consumption of sugar in India is only 3 kg as compared to 21.1 kg worldwide. This demand is low because of resistance of Indian population in adaptation of processed food and preference to gur and khandsari by rural population and by those also who migrated to urban areas from village recently. According to some estimates it is found that 60% of the cane grown in India is used of making gur and khandsari. Another reason for higher share of khandsari is that, khandsari industry is free from excise duty leading to better returns to sugarcane producers. Farmers themselves use to make gur from their own sugarcane saving labour cost and also reducing market size of sugar. To maintain a steady supply of sugarcane to each sugar mill, the central government has set a minimum radial distance of 15 kilometres between any two sugar mills. Given 15 km radial distance is a large number, this criterion helped to build a monopoly of mill owner over a vast region, which eventually led to exploitation of farmers, especially when landholding is modest. This makes the farmer reluctant to grow sugarcane if any other crop is possible on the field. Monopoly of sugar mill causes delay in disbursement of payment to farmers causing non-payment of loan if taken and lack of capital for next crop inputs. Apart from promoting monopoly, the 15 km rule also prohibits innovation and investment by entrepreneurs.

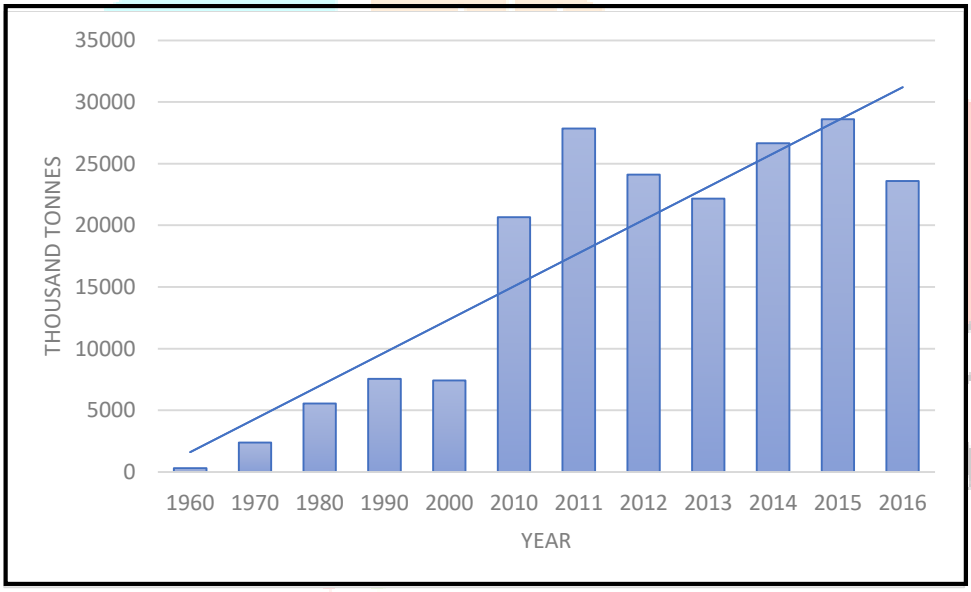
There is need to lift the distance norms implemented by the government. There is need to encourage export of the sugarcanes by reducing taxes over manufacturing, exporting. It may cause fall in government tax collection initially but later on it would be compensated by increase in foreign exchange of the country. Research and development are need of the hour for both the crop and manufacturing unit to reduce the price of Indian sugar in international market.

Fertilizer Industry

Fertilizer is described as any organic or inorganic, natural or manufactured agent that supplies one or more of the chemical elements/nutrients essential for plant development. Use of manufactured chemical fertiliser became an integral part of Indian agriculture after introduction of high yielding seeds as a part of green revolution in India. States associated with green revolution are also the states having highest consumption of fertilisers per unit area. Punjab, Haryana, Tamil Nadu and Andhra Pradesh are the states that uses more than 200kg of fertiliser per hectare. Indian soil is general deficient in nitrogen, potassium and phosphorous but some soils have one or two of these nutrients in sufficiency but lacking of the other one. India is self-sufficient in nitrogen fertiliser and is also the second largest consumer of it in the world

but have to import the other two from other countries and that too at large amount. About 50% of the total fertilisers used are imported in India. India is facing shortage of urea because of shortage of natural gas which is major component of urea. There is volatility in prices of natural gas that hits industries. Farmers procure urea at subsidised rate and that subsidy is paid to manufacturer by the government but payment seldom occurs at time disturbing the timely profit for industries and hinderance in their further functioning. Though urea is under cost-based subsidy regime so inefficient producers receive same subsidy as efficient ones thus no incentive to improve productivity. There is monopoly of government enterprises in fertiliser manufacturing and low promotion to private players leading to shortage of private players in the field.
Beside low production the already produced fertiliser is also not utilised by the farmers efficiently and scientifically causing wastage of fertilisers and adding up to imports. The NPK use ratio should be 4:2:1. In Punjab, however, the ratio is 61:19:1. Because urea is inexpensive to purchase because to government subsidies, farmers apply it more frequently, causing irregularity and lowering productivity. Water-soluble fertilisers are imported at a higher rate than local production, with more than 80% of Potassium Nitrate, 95% Potassium Sulphate, and Mono-Ammonium Phosphate imported. Only 16% of overall demand for water-soluble fertilisers is supplied by local production in the nation, with the majority imported due to a lack of breakthrough advancements in the technologies utilised in the sector, as well as high production costs.

Figure 4: Quantity of Import of fertilisers.



Source: The Economic Survey 2017-18.

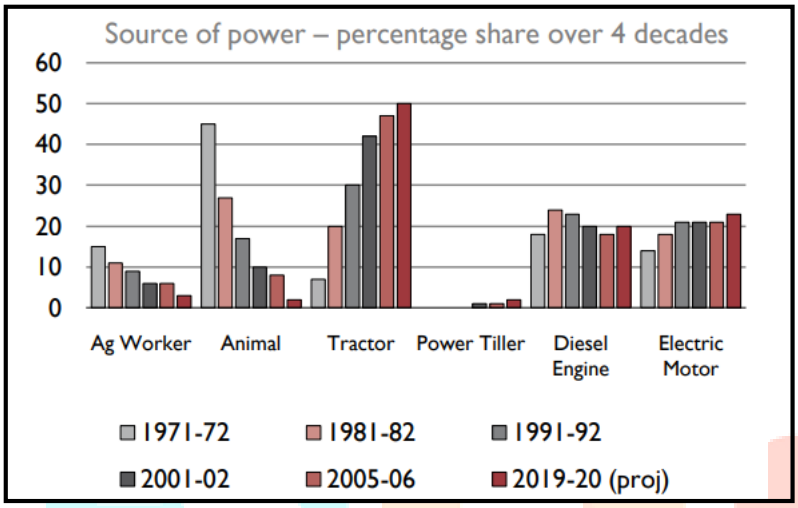
The government continues to neglect the fertiliser industry's problems. Currently, the import duty on both imported raw materials and finished products is the same, although raw materials should be subject to lower customs charge than finished items in order to stimulate domestic manufacture.
There are huge prospects of fertiliser industries for India in future because of development of new seeds that could bring the uncultivable land into cultivation thus would also create demand for more irrigation and fertilisers. India as discussed focusses only on NPK fertilisers, whereas any plant needs at least 17 components for their development. Demand of other form of fertiliser is yet to be open and would become intense with the awareness and skill development of farmers and movement of the agriculture towards sustainable development.

Agriculture Machinery Industry:

Share of agriculture in GDP is decreasing and its revival demands efforts in the forms of improvement in productivity, skill development among farmers, use of farm machineries etc. Agricultural equipment

sector in India has huge prospects because of very limited use of machinery by the farmers but increasing trend for adoption of machinery, improved availability of finances, emergence of contract farming, focus on productivity etc. India's agricultural equipment industry has a diverse product portfolio which caters to requirements across the value chain. Land development, tillage, seed bed preparation needs Tractors, Levellers, Ploughs, Dozers, and Scrapers. Sowing and planting require Drill, Seeder, Planter, Dibbler and Transplanter. Shovel /Plough, Harrow, Tiller, Sprayer and Duster performs weeding, inter cultivation, and plant protection.

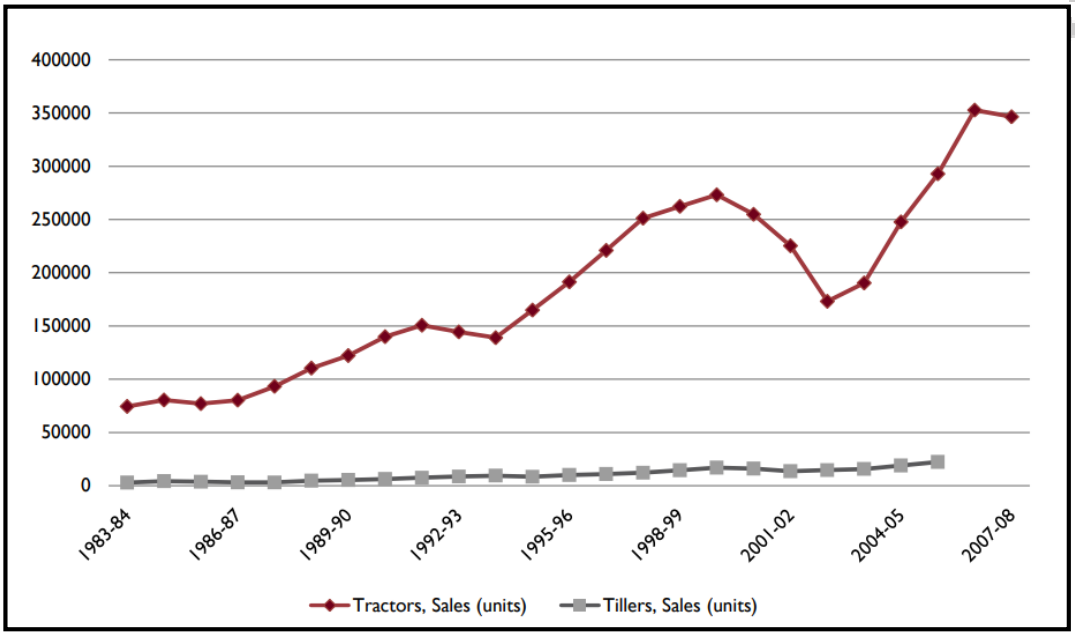
Figure 5: Dominance of Tractor in Farm Mechanisation.



Source: FICCI.

Harvesting and threshing is done with the help of Harvester, Thresher, Digger, Reaper, Sheller and Sickle/ Dao. Post harvesting and agro processing engages Seed extractor, De husker, Huller/ Dehuller, Cleaner, Grader, Mill and Dryer. Mechanisation in India is mainly driven by increased use of tractors.

Figure 6: Growth of tractor and tiller sales in 25 years.



Source: AGRICULTURAL EQUIPMENT SECTOR IN INDIA, IBEF.

Some of the challenges that the sector is facing is suboptimal irrigation infrastructure with lack of coverage of all farmers with irrigation facility, increasing fragmentation of holdings making the farms unsuitable for application of machinery. Mechanisation requires capital in the form of savings which in case of India is lacking for most of the farmers. Though, there would be huge demand of the products in initial phase

but once the mechanisation reached up to peak stage after that demand would fall rapidly because of high product life with low rate of replacement and upgradation.

Conclusion

India is highly dependent over agriculture when observed in terms of demography engaged (nearly 50%) in it but contributes merely 15% in GDP of the country. Factors including large labour force, huge tracts of fertile plains of perineal rivers, and rich in mineral central plateau advocates better performance of agriculture if is linked with the manufacturing sector that is if agriculture-based industries are promoted. Promotion of agro based industries would cause economic growth of the country, decentralisation of manufacturing activity from urban to rural India causing reduction in inequality of economic status of urban and rural population, creation of employment opportunities in rural areas curbing large scale rural urban migration for employment. Employment in rural areas would have recurring effects in the form of more saving and increase in demand at rural area which would further encourage both agriculture and allied activities and establishment of more agriculture-based industries.

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