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INDIAN AGRICULTURE AND FARMERS – PROBLEMS AND REFORMS

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Introduction:

In olden days, agricultural technique was eco-friendly but didn't yield high crop comparing now. Anyway, that is enough for those people as there was less population. Those farmers were seen as GOD but now it is in contrast. Only governments are respecting farmers and that too only for those belong to their state or country. Even, farmer's families do not give respect if they have low income or if their crop failed. Some parents resisting their children in choosing agriculture as their career field due to their disrespectful towards farmers but they do not understand that without farmer, it is impossible to survive in this world. It is horrible to see that even farmer do not prefer to see his son as farmer due to influence of this society.

Now days, many farmers left their farming work and went to some nearby industries. Also, some committed suicide and the reason is that their crops are failed due to unavailable of water sources. There is another case also that some farmers who have few acres do some research on their own and finding new techniques so that they can achieve maximum crop yield. These farmers arrange private water sources and also earn more. These farmers are selfless as they also publish about their work with no charge. Anyway, some are eco-friendly and some not.

If we focus deeply in it, day by day farmers are discouraging by this helpless society and we can understand that farmer's conditions are based on their experience and also on their determination. However, it shame to see that states of our country act as envy countries for lending their water sources for agriculture. In India, we are following many modern techniques to increase crop's yields. Either it is eco-friendly or not, we continue giving importance to improve the crop yield as to withstand the increasing population. Therefore, we lost the uniqueness of olden day's agriculture as these modern techniques reduce the strength of the crops and also reduce land's fertility.

Anyway, these farming techniques are necessary as day by day farming lands are converting into apartments and factories. Actually, everything is happening in contrast as for increasing population, we must increase the agricultural land but instead we are decreasing it and that result in using modern techniques without considering whether it is eco-friendly or not. And, these farming techniques give more profit only if we done more investment. Some of the farming techniques found by farmers on their own researches is spreading in newspaper and in internet for encouraging other farmers to continue it and

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earn more but we forget that many villages have no internet facilities and many farmers don't know to read. So, the awareness is lacking. Our government should appoint some persons to spread awareness about these profitable techniques to uneducated farmers.

Some are non-eco-friendly but still we continue. We must understand that anything which is non-eco-friendly may be profitable for time being but not ever lasting. It may result in danger in future. Hence, it is better to follow profitable eco-friendly farming techniques than anything else for better future.

Importance of agriculture in Indian economy:

India is mainly an agricultural country. Agriculture is the most important occupation for most of the Indian families. In India, agriculture contributes about sixteen percent (16%) of total GDP and ten percent (10%) of total exports. Over 60 % of India's land area is arable making it the second largest country in terms of total arable land. Agricultural products of significant economic value include rice, wheat, potato, tomato, onion, mangoes, sugar-cane, beans, cotton, etc. Agriculture is the backbone of Indian economy. Though, with the growth of other sectors, the overall share of agriculture on GDP of the country has decreased. Still, Agriculture continues to play a dominant part in the overall economic scenario of India. Food is essential for life. We depend on agricultural outputs for our food requirements. India produces large quantity of food grains such as millets, cereals, pulses, etc. A major portion of the food-stuffs produced is consumed within the country. Our farmers works day and night to feed our population that counts over 1.21 billion. Besides agriculture with a commercial bias, subsistence agriculture with its emphasis on the production of food for the cultivator's family is widespread. Traditionally, Agriculture is followed as the simplest method of obtaining food for the family. Agriculture in India is more a 'way of life' then a 'mode of business.

India exports excess food and agricultural products. A large proportion of India's export trade is based on the agricultural products, such as jute, tea, tobacco, coffee, spices, and sugar. It helps in increasing the foreign exchange. India is ranked seventh in terms of agricultural exports. In 2013, India exported agricultural products valuing around 39 billion dollars. Agriculture is the basic occupation for majority of main-workers in India. A large number of rural women are also engaged in agriculture. According to 2001 census, over 56.6% of the main workers in India are engaged in agricultural and allied activities. A number of industries are agro-based industries, such as jute, cotton, sugar, tobacco, etc. Raw materials for such industries are supplied from agricultural produce. Green revolution began in India with an objective to give greater emphasis on Agriculture. The era of Green revolution that began in 1960s witnessed significant increase in the production of food crops. The introduction of improved methods of agriculture and high yielding varieties (HYV) seeds, mainly wheat, had resulted into remarkable improvement in agricultural outputs. The productivity of land increased tremendously giving huge economic boost to the nation.

Characteristics and Problems of Indian Agriculture:

As stated at the outset, Indian economy hinges on agriculture. The socioeconomic status of the people, the national polity and the gamut of life of the people is directly controlled by agriculture. The Indian agriculture, however, has its own characteristics.

Some of the important characteristics and problems of Indian agriculture have been described briefly in the following section:

1. Subsistent in Character: Despite eleven five year plans, in greater parts of the country, Indian agriculture is subsistent in character. The cultivators and farmers grow crops mainly for the family consumption. It is only in the controlled irrigated parts of the country like Punjab, Haryana, western Uttar Pradesh, and Kaveri delta where agriculture has become an agri-business or is market oriented.

2. Heavy Pressure of Population: The Indian agriculture is characterised by heavy pressure of population. About 70 per cent of the total population of the country is directly or indirectly dependent on agriculture. At present, the per capita agricultural land is only about 0.10 hectare as against 0.30 hectare in 1951. The world average of per head availability of agricultural land is about 4.5 hectares. The fast growth of population industrialization and urbanization are putting enormous pressure on arable land.

3. Predominance of Food Grains: In both the Kharif (summer) and the rabi (winter) seasons, grain crops occupy the greater propor-tion of the cropped area. In fact, rice, maize, millets, bajra, ragi, and pulses are the dominant crops in the kharif season, and wheat, gram and barley occupy over three-fourth of the total cropped area in the rabi season.

4. Mixed Cropping: In the rain-fed areas of the country, mixed cropping is a common practice. The farmers mix millets, maize and pulses in the kharifseason and wheat, gram and barley in the rabi season. In the areas of Jhuming (shifting cultivation), ten to sixteen crops are mixed and sown in the same field. The rationale behind mixing of crops is to get good agricultural return. In case the monsoon is good, the rice crop will give better production and in case of failure of monsoon, the less water requiring crops like maize, millets, bajra and pulses will give good harvest. Mixed cropping is a characteristic of subsistent agriculture.

5. High Percentage of the Reporting Area under Cultivation: In India, about 55 per cent of the total reporting area is under cultivation of crops and pastures. This is much higher when compared with about 4 per cent in Canada, 12 per cent in China, 15 per cent in Japan, and 16 per cent in USA.

6. Limited Intensive Agriculture: In India, only about one-third of the total cropped area is under double and multiple cropping. Increase in the double cropped area is difficult unless heavy investment is made in development of canal and tube-well irrigation.

7. Primitive Technology: Most of the farmers of the country, especially in the rain-fed areas, use draught animals (bullocks, male buffaloes and camels) for ploughing and other agricultural operations. The health and efficiency of draught animals is low which often retards the timely operations of sowing, weeding, and harvesting.

8. Indian Agriculture is Labour Intensive: In India, agriculture is a labour based enterprise in which most of the agricultural operations, like ploughing, levelling, sowing, weeding, spraying, sprinkling, harvesting, and threshing are carried on mainly by human hands. The use of machinery is still confined only to the rich fainters of Punjab, Haryana, western Uttar Pradesh, plains of Uttarakhand, Bihar, Madhya Pradesh, Gujarat, and Maharashtra.

9. Rain-fed Agriculture: In the greater parts (over 56%) of the country, agriculture is largely dependent on rainfall, especially the summer monsoon. Unfortunately, the behaviour of summer monsoon is highly erratic. Consequently, the variability of rainfall is

high which affects the agricultural return ad-versely. Only about 55 per cent of the total cropped area is under irrigation in which the farmers are more confident about their agricultural returns even at the failure of monsoon, as it happened in 2009.

10. Less Area under Leguminous and Fodder Crops: The nitrogen fixing crops like pulses are getting less area under their cultivation. Consequently, the natural fertility of the soil is depleting and the soils are losing their resilience characteristics. Moreover, less than 4 per cent of the cropped area is under fodder crops. This, together with lack of good pastures, has detrimental effect over the development of dairy farming and milk-production. India has the largest number of cattle in the world, but it occupies an insignificant place in respect of cattle products in the world.

11. Tradition Bound: By and large, the Indian agriculture is tradition bound. Established several centuries ago, the structures of a self-contained rural economy were founded in caste-derived occupational land tenures, made complex by absentee and parasitic landlords. These institutional factors and tradition bound institutions are a major obstacles in the path of innovations and modernisation of agriculture.

12. Low Productivity: One of the main problems of Indian agriculture is its low productivity. In comparison to the other agricultural countries, the Indian agricultural yields are among the lowest in the world (Table 9.4 and Table 9.5). The main cause of low yield per hectare is the low fertility of soil and less care to replenish it through green-manure, fertilisers, fallowing, and scientific rotation of crops. The consumption pattern of chemical fertilizers has been shown in Fig. 9.4. It may be seen from this figure that Punjab with 175 Kg/ha is the leading consumer of chemical fertilisers followed by Haryana 160 Kg/ha. Uttar Pradesh, Andhra Pradesh, Tamil-Nadu and West-Bengal. In general the fertiliser consumption level is very low in the areas of dry farming.

13. Government Policy: After the First Five Year Plan, Indian agriculture got a step-motherly treatment. The farming community has been ignored, while there has been more emphasis on industrialisation and urbanisation. The growth rate of agriculture is only about 2.5 per cent, while the overall growth rate of the country is about 9 per cent (2010). The farmers are not getting remunerative prices, most of them are under debts and in several parts of the country, farmers are committing suicides. This dismal picture is the result of continuous careless agricultural land use planning. Muclemphasis has however, been laid on the rural and agricultural development in the Elevend Five Year Plan to remove the rural, urban inequality. Creation of 580 lakh jobs has also been proposed in this plan to overcome the problem of unemployment and to check the ruraf-urban migration. The real challenge for the government is in trying to boost food output at, home, and increase investment in rural and agricultural infrastructure for the same, while at the same time not letting its guard down on fiscal prudence or inflation management. The severe drought of 2009 over greater part of the country has increased the miseries of the farmers, which is a set-back in the revival of Indian economy.

14. Lack of Definite Agricultural Land Use Policy: In the absence of a definite land use policy, the farmers grow crops according to their convenience. This sometimes leads to excess of production and sometimes scarcity. Many a times the farmers have to burn their sugarcane crop and often get less remunerative price of vegetables (onion, and other vegetables).

15. Low Status of Agriculture in the Society: In greater parts of India, agriculture is not considered as a dignified and honourable profession.This leads to disappointment

and lack of enthusiasm among most of the farmers. The younger generation of farmers prefer a petty government job to agriculture. Moreover, rich farmers invest their agricultural profits in non-agricultural sectors which are more remunerative. In fact, there is a mass exodus of people from rural to urban areas in search of lucrative jobs. There is a constant flow of human and material resources from villages to the cities. This has led to fast growth of urban centres which are infested with slums, ghettoes, and shanty colonies.

16. Land Tenancy: In many parts of the country, there are absentee landlords and the tillers are not having the rights on agricultural land. The big landlords who own big farm houses are rich urbanites. The tillers and share croppers who actually cultivate the land of absentee land lords are not much interested_ inthe development, proper management, utilisation of agricultural land, and modernisation of agriculture. This system leads to lack of interest on the part of the tiller and consequently, the per unit yield of most of the crops is low.

17. Poverty and Indebtedness of the Farmers: Although cultivators indebtedness is universal in subsistent farming, its impact is perhaps nowhere as crushing as in India. Unfortunately, over 85 per cent of all the cultivating families are under debt. It is because of heavy indebtedness that several thousand farmers in Andhra Pradesh, Karnataka, Tamil Nadu, Maharashtra, Orissa, Gujarat, Punjab, and Uttar Pradesh have committed suicide during the last ten years. The small and marginal farmers are still dependent on money-lenders who charge exorbitant interest on loans (25 to 40 per cent per annum). In the case of non-payment, the money-lenders grab their mortgage property making them pauper. Some special provisions have been made in the draft of the Eleventh Five Year Plan to overcome the problem of farmers indebtedness. A scheme of debt waiving for small and marginal farmers and debt relief for other farmers was announced by the government in the Union Budget of 2008-09.

18. Inadequacy of Extension Service: For the diffusion of agricultural innovations both in the irrigated and rain-fed areas, a team of skilled village level workers is required. There is much to be done in this area. Training of workers and their dedication can help the tradition bound farmers to modernise their agriculture.

19. Inadequate Agricultural Research and Education, Training, and Extension: Though enough progress has been made in the field of agricultural research, there is no co-ordination between the farm and research laboratories in the different agro-climatic regions of the country. Hence, gains of new agricultural researches are not reaching the common cultivators, especially the marginal and small farmers. Very little attention is being paid for educating and training farmers for the adoption of new agricultural innovations and techniques to increase their agricultural production.

20. Other Characteristics and Problems: There are numerous other problems also which are affecting the agricultural production and rural economy and society adversely. For example, unscientific methods of agriculture, inadequate irrigation facilities, less use of chemical fertilisers, insecticides, pesticides, less remunerative prices of agricultural products, poverty, hunger, and malnutrition of farmers and lack of infrastructural facilities like roads, water, irrigation, electricity, credit, banking, and crop-insurance.

Farming Corporatization would be a Solution:

An idea of corporate farming is that let a corporate own a farming of a village. Let him take the land of farmers on a lease for 5 years or 10 years depending upon his investment. The corporate can give the lease amount either quarterly or monthly to the land owners. Then he can employ the farmers (land owners or not) for his intended crop depending upon his planning. The corporate would provide all the technologies, infrastructures (like cold storages, food processing units etc). Finally the corporate would take back all the crops. If there is more profit, he can distribute bonus among land owners and farm labourers.

This would end the problem of investment, technology and other problems which government can't afford. Even FDI can be brought in this sector. This will enhance agriculture productivity, end stress among farmers (land owner or not) and address the farm suicide very effectively. There are some problems also. The above idea can work in the areas having some infrastructures like connectivity, irrigation and other suitability. India's large farm land lacks connectivity, forget about irrigation.

Law and order is also a concern in many areas where corporate wouldn't risk its investment. Sometimes Corporate sector might want a guarantee for collecting his harvest. There would be some problem in labour law related issues.

On the other hand as we witness the way Sugar factory cartel harass the sugarcane farmers (not paying the cost of sugarcane and sometimes paying less rate) as in UP and Maharashtra; same thing can develop by cartel of corporates too.

Precision Agriculture would also be the Solution to the Problems:

A small sugarcane farmer in western Uttar Pradesh, Shri Raghuvir Singh and his family, own about four hectares of land. He has two sons who are both graduates and work in Gurgaon. When I asked him why he did not make his sons farmers, he says that farming is hard work, is non-remunerative and it is difficult to get labour. Besides he also thinks that farming is not glamorous, a farmer's son is a non-marriageable commodity and that his sons have a better life in Gurgaon. Shri Singh is getting on with age and is thinking of selling his land to the highest bidder and moving out of farming and even going and staying with his sons in Gurgaon. Village after village and state after state, this is the story of most farmers in India. They want to sell their land and move out of farming. Indian agriculture is in crisis. No matter how advanced or rich we become, all of us have to eat food. We cannot eat money, mobiles, software or nuts and bolts.

We feel wealth and security of the country comes from its land and hence what is needed is sustainable, high-tech and high productivity agriculture which will be remunerative and help provide both food and energy security. Precision agriculture, which can provide precise inputs like water, fertilizer, insecticides at the right time to crops, can help bring in the next green revolution.

In the existing agricultural scenario, India is characterized by small farms with around 80 percent of total holdings less than 2 hectares (5 acres) and land mostly rainfed with only 30 percent irrigated. Around 55 percent of the Indian population depends on farming, as against less than 4 percent in US and other advanced economies, because of heavy mechanisation of agriculture. Because of poor availability of funds, farm inputs, poor support price structure for the produce and almost no farm insurance, farming in India is

non-remunerative and 50 percent of farmers are in debt - the main reason for a large number of suicides.

Precision agriculture (PA) may provide a way to do it:

Precision agriculture is originated in US and European countries where farms are generally big (over 100 hectares), it sees extensive use of Global Positioning Satellite (GPS) for precise mapping of farms and - with appropriate software - informs the farmer about status of his crop and which part of the farm requires inputs like water, fertilizer and pesticide etc. In western countries it is also characterized by increased mechanisation with the use of heavy farm machinery (average power 100-200 kW) for all the farm and field operations such as sowing, harvesting, weeding, baling etc. The machinery runs on fossil fuels and uses about 63 percent of the total energy used in farming - a significant amount. Precision agriculture for small farms, on the other hand, can use small farm machinery and robots which may also be amenable to run on renewable fuels like bio oil, compressed biogas and electricity produced on farms by agricultural residues. The energy efficiency of the machinery and operations could also be improved. For small farms, precision agriculture may include sub-surface drip irrigation for precise water and fertilizer application to the crops and robots for no-till sowing, weed removal, harvesting and other farming operations. Some of these robots are already being used on small farms in US and Europe and with vigorous R&D taking place, it is expected that they may be deployed in large scale in near future. Similarly drones are being used quite regularly in Japan and US for insecticide application to the crops. Use of drones for agriculture is proverbial "turning swords into ploughs!" Most of these robotic machines and drones are small in size and hence are very suitable and excellent match for small farm applications. Thus small farms size of India is a blessing in disguise and ripe for large scale application of precision agriculture. Precision agriculture in US and other countries has shown tremendous increase in productivity, lowering of inputs and hence increased remuneration to the farmers. Besides it has helped improve the quality of land with no-till farming and less water usage. Similar things are possible in India with its use. However, the biggest criticism of mechanized agriculture is that farm machinery is very costly and no farmer, including big ones, can afford it. Since precision agriculture is going to be very dependent on mechanization, this criticism is presently justified. However, we feel the mechanization and PA may give rise in a big way to farm machinery leasing agencies in rural areas. These companies will lease the mechanized equipment, including drip irrigation systems, to the farmers and also provide trained manpower to run these machines.

Such a thing already exists on limited scale in India where few agencies do the wheat harvesting using combines and spraying of crops. They charge the farmers on per hour basis and with the unavailability of farm labour, farmers find this concept economical and attractive. In western Maharashtra, more and more farmers are depending on mechanisation offered by such agencies. With increasing demand these leasing enterprises will increase and as PA develops and increases, they will get more structured, so that just like private taxi companies, they will be available on demand. It is also envisaged that these leasing companies may form the backbone of Indian agriculture by providing the necessary advice and manpower to the farmers on precision agriculture.

Critics of mechanisation also contend that by timely sowing of crops and applying proper and recommended water and fertilizer to it, a farmer can easily improve the

productivity of crops and his income. However application of inputs at proper time requires timely availability of labour, water and fertilizer - all of which are becoming scarcer and scarcer. Besides majority of farms are rainfed and with the change of weather patterns, availability of rainwater is very unpredictable. Hence the non-availability of inputs and labour on time is the biggest stumbling block to increase productivity of farms and remuneration. PA can help in this matter. To our mind the ultimate role of a farmer should be to identify better crops, use that seed to propagate it further and hence in effect become a breeder of sorts. Progressive farmers already do that and with more time available to them because of PA they may be able to help Indian agriculture to produce better and higher yielding varieties. Also the mechanization will make the farming glamorous and may attract more people to take up farming in a big way. The most important component in taking PA forward will be in creating a huge resource of engineers, scientists and agriculturists to develop various components of the technology. Without excellent manpower and consequently good R&D, Precision agriculture will not succeed. One of the misfortunes of Indian education system is that all the good students want to get into engineering and medical streams and only the leftover students go into agriculture. There is a need for excellent engineers from institutions like IITs, NITs, etc. to design machinery like robots and drones for PA. This can be facilitated by establishing a new branch of engineering called agricultural mechanotrics or robotics where faculty and students from almost all branches of engineering will interact and collaborate to develop smart systems for Precision agriculture. Another way forward is when scientists from ICAR institutes, engineers from academic world, industry and farmers work together in developing Precision agriculture.

We also feel that Precision agriculture may provide a platform for industrial corporate social responsibility (CSR) activity. After all helping the rural poor improve their livelihood through high tech farming should qualify as a CSR activity. The Indian government can facilitate in this process by giving soft loans and sops to the industry so that they get more engaged in agriculture and PA activities. High tech Precision agriculture therefore can help in bringing next green revolution to India and can produce tremendous rural wealth in a sustainable and environmentally sound way. Farmers and farms are the backbone of any country since they can produce food, fuel (agricultural residues) and wealth from the land. They should be helped by all members of society and developing Precision agriculture is a step in the right direction.

Conclusions:

The critical issues that plague Indian agriculture at present are the knowledge deficit and infrastructure deficit, especially in the rural areas. Problems related to irrigation infrastructure, market infrastructure and transport infrastructure add significant cost to farmers' operations. Another issue is lack of delivery mechanisms. There are a number of schemes aimed to bring development in agriculture. We do not have effective delivery mechanisms that can translate into effective facilitation in terms of increasing productivity or decreasing cost or increasing price realization at the ground level. Moreover, inadequate government support exacerbates these issues. Thus, corporate farming could be a solution to Indian agrarian sector, but it needs a deep thinking and innovating better policies so that neither the corporates nor the farmers be at loss. Also the role of central government and state governments needs to be defined clearly as because of being a joint subject, it creates

lot of confusion. Eminent experts should do research in this aspect and governments must take a proactive action. Indian agrarian sector in fact requires very innovative ideas for uplifting of this sector. Also, without mechanization, farming is hard and back-breaking work. This has resulted in most farmers' children quitting farming and going for other vocations. Farmers get more money in selling their land to builders, malls and factories. This has put more pressure on farmland, thereby requiring technologies to increase the productivity so that shrinking farmland can feed billion plus people of India in the future. India, though one of the biggest producers of agricultural products, has very low farm productivity, with the average only 33 percent of the best farms world over. This needs to be increased so that farmers can get more remuneration from the same piece of land with less labour.