

Challenges And Prospects for Better Agriculture Practices in India

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Abstract—The history of agriculture in India dates back to Indus valley civilization era and even before that in some parts of south India. India is called the agricultural power house of the world. Agriculture plays important role in developing the Indian economy as it contributes about 20 per cent to the Gross Domestic Product (GDP) of the country. The gross value added (GVA) by the Indian agriculture and allied sectors has made up 15 per cent of the country's total GVA. The sector admirably has achieved a compound annual growth rate of around 4 per cent over the five-year period. More than 70 per cent of the population is directly or indirectly reliant on agricultural. Agricultural promotion includes many operations and processes through which the food and raw materials move from the farm to the end users. Agriculture provides goods for consumption, manufacturing sector and exports sector. Growth and development of agriculture for local and external markets can be considered as a powerful tool for poverty reduction and to fight against the challenge of food security in developing countries like India. Though the growth in this sector is very crucial for the Indian economy, it is crippled by several hurdles like less productivity, lack of competitiveness of farmers, lack of crop insurance, farming infrastructure facilities, suicides and so on. With this view, the present study focuses into the problems related to the agriculture and provide some of the key measures to enhance the value of agriculture as well as to make agriculture as a sunshine sector in Indian economy.

Index Terms—Agriculture, Farming, Gross value added, GDP, Indian economy, Insurance, Poverty

I. BACKDROP

Agriculture is the backbone of the Indian economy. It has undergone rapid transformation in the past two decades. It provides food security to the population, major employment opportunities to the rural population and consequently, a large domestic market

for manufactured goods. This sector also accounts for 13 per cent of India's exports. In India 66 per cent of work force is employed in agricultural sector. Further, the policies of globalization and liberalization have opened up new avenues for agricultural modernization. Due to its importance in national output and employment, agriculture is been paid special attention by India's policy makers and development planners which helps this sector to play an important role in economic development of the country and in improving income and living standard of vast population dependent on agriculture. In addition to agriculture, the allied activities create a cushion to the farmer. They provide an important source of supplementary income to the small and marginal farmers and women in the rural areas.

Being a source of livelihood and food security of the nation, higher growth in agriculture assumes great importance and is matter of concern. The growth in agriculture productivity has not been sustainable, which is stagnated in recent years, resulting in significant decline in the income of farmers. In India, the input of technology in agricultural sector is critically low. The low crop production is a critical issue. In this scenario, there is a dire need of combined effort in terms of technology, policies and government support to ensure sustainability and high growth in agriculture sector

II. OBJECTIVES OF THE PAPER

The present paper has been studied keeping in view mainly on the following objectives:

- To assess the role of agriculture in the growth of Indian economy;
- To appraise the challenges faced by agricultural sector; and

- To provide useful inferences for better agricultural yield.

III. METHODOLOGY OF THE STUDY

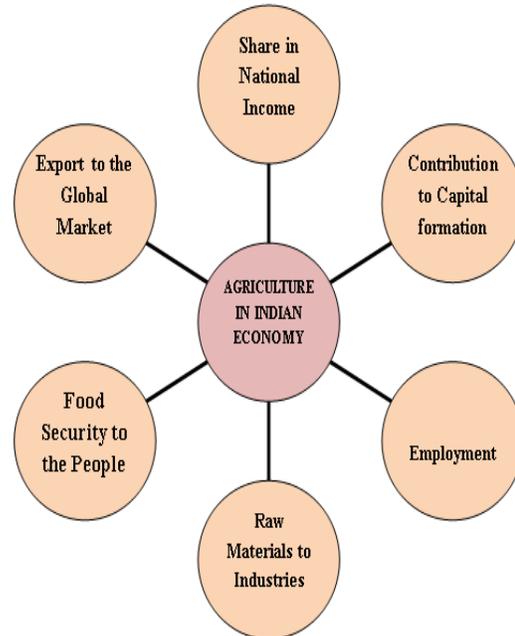
This study is based on secondary data. Data is collected from books, journals, internet comprising Government reports and other information websites.

IV. ROLE OF AGRICULTURE IN INDIAN ECONOMY

The agriculture sector is an important component of the primary sector. Its importance has extended to both secondary as well as tertiary sectors. The contribution of agriculture in the development of Indian economy is acknowledged highly and significantly. Some of its important facets are:

- During the last five years, agriculture and its allied sectors have contributed an average annual growth of 4 per cent to the country's income.
- Agriculture provides livelihood. It has become a primary source income for two-thirds i.e. 66 per cent of population of India. Providing employment opportunities to such a large extent of population is a great achievement in itself.
- Agriculture's one of the basic roles is to meet the increasing demand for food. Agriculture is significantly focusing and continuing its expansion of food production with an aim to provide surplus food grain in the market thereby, avoiding food shortage.
- Economic development of the country is vastly depended upon its capital formation. Agriculture as a largest sector in India supplies raw material to the industries like sugar industry, textile industry, oil industry etc., thus, providing a crucial aid in increasing the rate of capital.
- Industrial products are marketed in rural and backward areas. Rise in income of the farmers through green revolution has immensely affected their utility and power of purchasing.
- Agro-based and food processing industries are heavily relied on agriculture. As agricultural raw materials are processed and marketed as finished products to the consumers eventually, contributing to the economic development. Thus, agricultural supplies are essential in the development of these industries.

- Agriculture has been a vital source in the extension of major part of trade and commerce in the country. Godowns, warehouses, railways and roadways under transport sector are very much dependent on agricultural goods for their revenue.
- Government of India gets huge revenue from rising land. A substantial income is being generated frequently to the nation from agriculture and its allied sector such as animal husbandry, fishing, horticulture, poultry, dairy farming, cattle rearing, milk production and so on.
- Agriculture through exports of its yields has vastly contributed to the nation's earning. It has created an image to the country at global market. Agro based edible products such as spices, vegetables, fruits, oil cakes, tea, coffee, sugar, cashew nuts, etc., and jute, cotton, raw wool under textile products is exported on a regular basis. These export units alone contribute around 70 per cent of the total export eventually boosting the foreign exchange power of the country. Further, the induction of organic farming has played an important role in the increase of exports since the last few decades and has garnered a competitive edge on agriculture inputs due to cost advantage.



Opportunities for agricultural practice in India
 Agriculture forms a very important sector of the Indian economy. A numerous opportunity can be tapped to encourage sustainable and inclusive progress for an enormous production in the agricultural sector:

Population

In recent days, India overtook China as the country with the largest population in the world. Currently, India is ranked first in the list of countries by population. Growing size of population has an immense impact on the demand for food and agro based industrial products. This can be captured by enhancing cultivation of more agriculture production and consequently, exploring new markets domestically and internationally.

Monsoon

A good monsoon leads to higher demand for input and results in copious crop. The performance of agriculture production to a very great extent depends on the monsoon. The success of the agriculture activities in India is determined by the adequacy of monsoon. India is a large country with a diverse climate. Thus, advancing it as more favorable for the cultivation of variety crops in large. Eventually, as agriculture incomes rise, the demand for agro products will rise and prosper.

Organic farming

The practice of organic farming is said to be best method. At present, India is in a nascent stage in organic farming. The organic food market in the world has grown rapidly in the past two decades. Organic farming is bound to grow around the world. An important progress towards organic agriculture is been made by India over a decade. Further, the Govt. of India is supporting and promoting organic farming by providing assistance to the farmers through various schemes. Indian farmers, particularly the small and marginal are deriving the revenue by organic farming which has become a crucial turnaround farming practice in the Country.

Digitalization

Digital transformation has helped the agriculture sector in large. It has effectively transformed the farming methods resulting in better deployment of resources and energy. A sustainable and steady production has been observed in recent years. Digital transformation in agriculture has incorporated efficient farming techniques to transform the sector of agriculture as a result upgraded quality of crops, enriched harvests, reduced costs of production and value-added farm productivity can be witnessed. Moreover, it has been playing a pivotal role in attaining the goals of sustainability such as reducing the fuel usage used for inspecting the crop field thus

saving money of farmers, control of food wastage, proper use of water etc. In the year 2021 government of India has initiated Digital Agriculture Mission for five years on the projects associated with technology.

Consumers

In the 21st century, the opinions of consumers have changed substantially. The consumer has an enormous increasing effect on demand of agriculture products both in terms of quantity and quality. These days, consumers are very much aware about the process of production and connect them with agriculture in order to ensure a healthy and organic food so that they can evade sickness causing through unhealthy diet. In addition, the consumer receives full satisfaction when he reaches the utility of the product which does not allow one to constrain solitary to its quantifiable benefits but rather motivates to buy additional products. Furthermore, policy and regulations of nation and world concerning productive system and value chains have dynamically leveraged opportunities in the agriculture sector.

Export

The demands for agro products globally have led to the opening of new markets and supply chains for Indian farmers and businesses. The increase of export has been creating competitiveness in the sector and thus, appealing for more revolution and extension. The value of agro-exports to total exports of the country has been ranging between 15 to 20 per cent. India has emerged as a significant agro-exporter. Besides, the Government of India has introduced a comprehensive Agriculture Export Policy to promote exports of agricultural products which is enabling the farmers to get the benefit of export opportunities in overseas market.

Logistics

Logistics effectively managed is essential for agriculture production. It is a crucial link between farmers and consumers as it ensures that agricultural goods reach markets in a timely and economical manner, helps in reducing losses occurring after harvest and safeguarding food thus, uplifting the Indian agriculture. A logistics activity such as storage facilities, handling, and transportation of crops and distribution of crops has boosted the growth of agricultural products. It facilitates the optimal and continuous movement of agro-products from the producers to ultimate consumers, from rural to urban areas, from national to international, thus generating

the revenue to farmers. Logistics not only improves agriculture productivity and income but also significantly contributes towards the growth of economy. Further, an annual growth rate of 5 per cent has been estimated for agricultural logistics in Indian market by 2030.

Government Initiatives

The Government of India has always shown dedication and relentless effort in fostering agricultural development. They have inducted several initiatives such as the Pradhan Mantri Fasal Bima Yojana, Pradhan Mantri Krishi Sinchai Yojana, Pradhan Mantri Kisan Samman Nidhi, Pradhan Mantri Kisan MaanDhan Yojana and the e-NAM (National Agriculture Market) initiative. As of today, a new initiative AgriSURE has been successfully launched. These initiatives enable farmers with ample opportunities to access technological support, irrigation facilities, crop insurance and information of the market to enhance their productivity and profitability. Moreover, the government is aiming to drive investments in the agriculture sector and striving to generate affordable innovative and appropriate solutions which will empower farmers towards production upsurge, bearable cost of production, profitable values, avoidance of post-harvest loss, diversification of crops and ensured protection through crop insurance during loss.

Others

Agro-forestry and agro-tourism, a booming sector is a value-added source of income. If it is capitalized as it should be farmers can earn added revenue resulting promotion of sustainable land use practices.

Several avenues are available for agriculture development in India. It can be leveraged by proper utilization of infrastructure, right access to technology, finance, and market information, as well as sustainable land use practices and organic farming. By undertaking so, sustainable and inclusive growth in the agriculture sector and overall economic development of the country can be achieved.

V. CHALLENGES OF AGRICULTURE IN INDIA

During the last fifteen years, several challenges have surfaced in Indian agriculture which is becoming more and more severe with the passage of time. The

increasing pressures that pose challenges and threats to agriculture sector are climate change, soil erosion, biodiversity loss, pests, natural calamities etc. Following are the major challenges faced by the farmers in the agriculture sector in India:

Ownership

Land ownership is one of the significant factors that influence farmer's decision. Owning very little lands or not having any land has restricted farmers in many ways. In India, large parcels of land are owned by relatively a small section of rich farmers, landlords, money-lenders and non-agriculturists. Eventually, it reduces furtherance of agricultural investment. Endangering agriculture practices in the country by suppressing the interests of farmers will certainly deny the development and growth of rural India.

Irrigation

Irrigation is the most important agricultural input. Agricultural activities can be carried on a regular basis provided proper irrigation facility. It is evident that agricultural production has been affected due to the depletion of groundwater resource over the years caused by excess manipulation. Irrigation facility in the country has taken a back place resulting farmers to heavily depend upon rainfall. Unfortunately, rainfall in the country is uncertain, unreliable and erratic. Moreover, irrigation facilities are availed by only small population of farmers. Though, micro irrigation method has been in practice, only farmers pertaining to wealthy group are expending this method. Small and marginal farmers due to the financial constraint are not in a position to take the benefit of the system hence, accounting only 18.8 per cent of the total irrigated land holdings. Furthermore, natural disasters like heavy rainfall, floods and drought damages the crops leaving an irrecoverable loss.

Climate

In the country, sometimes unpredictable changes happen in the weather conditions. Uncertain changes in climatic conditions can lead to alarming happenings like heavy rainfall, floods, drought, heat wave etc. These influences the yield of crops, growth of livestock, quality of soil, provision of water and even health conditions of the farmers. A year of abundant output is often followed by a year of critical shortage. In drought hit zones where water resource is scarce farmers will be heavily relying on monsoon again

which are volatile in nature. Heavy rainfall during the harvest is not only a distress but also push the farmers into a huge financial crisis. In recent years, hydro-meteorological calamities have caused damage to nearly 34 million hectares of cultivated area. Ultimately, farmers were left with room of sighs and unbearable loss driving them to suicidal thoughts.

Yield

India has a wide diversity of soils and climate. Growing crops continuously over thousands of years without proper cropping system and not thoughtful about replenishment has led to the depletion and exhaustion of soils. Moreover, covet for increased and immediate yield farmers have used excessive and imbalance proportion of fertilizers. Eventually, the organic quality of soil is reduced and altered implying 30 to 60 per cent decline of best crop yield in India which is lowest compared to developed countries.

Land holdings

In 2015-16, India's total operational land holding was 146.45 million hectares as per the agricultural census. Further, it is constituted by small and fragmented land holdings. This small and fragmented land prevents farmers from cultivating profitable crops and dampens the scope for infrastructural development. Farmers possessing small and fragmented lands are forced to go for monoculture farming system. As a result, agriculture yield is low and farmers are unable to generate profitable revenue. Further, it has made the farmers less aggressive towards agriculture causing the deterioration of land quality and paving way for severe cost of production.

Credit

Since long time credit availability is been a decisive factor influencing the production of agriculture. Most of the farmers particularly small and medium still depend on credit for the cultivation. In the sector of agriculture, a timely available capital with lesser cost from various financial organizations is very crucial. As a prevalent culture in rural India still many farmers bank on local money lenders who charge them high interest rates denying enough credit access. Thus, non-availability of accurate capital becomes a barrier to the farmers from using quality seeds, farm machines, tools, technology, accessories, fertilizers, skilled labours etc., affecting the quality production. Moreover, any loss occurring due to drought, heavy

rain, fire, floods and any other uncalled natural calamity would only add to the farmer's woe, forcing them to sell a portion of their lands in order to repay their debt.

Technology

In India, most of the farmers lack awareness on the obtainability and usage of technology as they hail from rural areas. Despite of the availability of large-scale mechanism for agriculture most of the agricultural operations in larger parts are carried on by labourers. Though in many parts of the country (70 per cent) farm processing from ploughing to threshing, irrigation, seeding, weeding and other agricultural operations is practiced through mechanization, still a larger group of people are using simple and conventional implements like wooden plough, sickle etc. Lack of funds and illiteracy has become a constraint to the majority of the farmers in capitalizing these resources resulting low productivity.

Marketing

In rural India, agricultural marketing is still at low and unreachable to the farmers. Farmers face numerous problems like inadequate market information, price variations, unsuitable market infrastructure, and cost of transportations and like so. Generally, India produces variety of agro goods. The process of distributing and marketing of all these agricultural products becomes difficult and challenging. Due to the absence of sound and convenient marketing facilities, traders and intermediaries are exploiting the marginal and small farmers by driving them to sell their agriculture produce at unsatisfactory price.

Pricing

Consistency in prices is a boost to the agri producers. The price instability causes variations in the turnover to the farmers. Usually, pricing of agricultural products in the market is determined by its demand and supply. Any changes in these factors can lead to the swift decrease or increase in the prices of agricultural goods. Perhaps, if prices drop the farmers especially, the poor will be in a constraint position as their profit will be reduced and further, a state of chaos will be created for future productions. Moreover, farmers will not be able to forecast the quantum of production, crops to cultivate, whom to sell, where to sell and such like causing difficulty in decision making for future investments.

Infrastructure

Infrastructures like transportation, warehouses and storage facilities have been a concern since long time. A study conducted on the wastage of agriculture produce has found that 6 per cent of cereals, 9 per cent of pulses, 10 per cent of oil seeds and 16 per cent of fruits and vegetables are damaged annually due to the lack of storage facilities. Eventually, triggering a loss of 18 per cent to 40 per cent of the farm produces. Further, when it comes to the perishable agri goods farmers have no other choice but to sell them at fewer prices. Due to lack of proper supply chain, and infrastructural facilities, farmers not only losing profit but are also unable to store the unseasonal products which can generate revenue for its high demand in the market. Currently, all over the country there are lakhs of rural villages which are not rightly connected with leading roads and main market centres.

Programs

Training programs and extension activities on farm practices involving transfer of technology, access to irrigation, availability of fertilizers, usage of pesticides, technical know-how, rate of market orientation, decisions to overcome problems etc., are mandatory to control damage and to enhance the production. Lack of such activities has impacted the profit earning ability of the farmers and retained them untransformed, unskilled and less knowledgeable. Further, this has led to reduced crop varieties and yields incurring undesirable loss to the farmers.

Accessibility

The illiteracy and lack of awareness has kept farmers from accessing various schemes like crop growing financial aid schemes, crop loss coverage insurance schemes, minimum support price and so on. Non-capitalization of the financial accessibility by the farmers is making them helpless to increase crops yield as they could not invest sufficiently in the required areas. Further, inadequate knowledge on settlement claims, insurance schemes, damage control aids have paved the way for more risks and losses pushing them to leave farming and chose non-agricultural occupations for survival.

VI. SUGGESTIONS FOR AGRICULTURAL ADVANCES

New methods and techniques have boosted farmers to increase production and maintain farm's long-term sustainability. The main elements of the strategy to improve agriculture productivity are:

Land reforms

Government of India and States have framed various farm regulations and restrictions which is not enough to itself but they should ensure that these legal frameworks are implemented and agricultural activities are practiced in the farm lands. Further, the Govt. must aim for distribution of land among landless farmers. Legal restrictions and setting limits on the acquisition and holdings of land areas shall prevent concentration of land in the hands of few groups of people. A strict action should be assured against those who don't comply with the regulations and violate them. If necessary, arises more land reforms should be initiated to encourage farmers. These shall preserve agricultural land from exploitation, safeguard the interests of farmers and promote agricultural practices for sustainability yielding better return paving the way for furtherance of the rural economy.

Research and extension

Agricultural research and extension system helps to increase the farm production. Regular research activities and projects should be carried to explore innovative agriculture and farming techniques. Innovative farming technologies and new crop varieties will boost per hectare net income thus, expanding country's export. Further, discovery of the integrated production systems for both crop-livestock will enhance the diversity and environmental sustainability. Farmers can generate profitable income through the establishment of research parks.

Agricultural Universities, Research institutions, Krishi Vigyan Kendra's, fertiliser companies, State departments of agriculture and farmers' associations have to extend and support by providing relevant and useful information for agriculture improvisation.

Irrigation and water management

Water resources are limited and water for irrigation must contend with increasing industrial and urban needs. Water management should be extended in river basins for the convenient and superior usage. Rainwater harvesting, recharge of an aquifer and renovation of existing wells and ponds should be prioritized for strong supply of water. Such methods

under certain conditions will lead to determine the exact nutritional and water requirements of the crop making it possible to find sustainable alternatives for the area. Moreover, expansions of canals, tube wells and water dispersal system will provide better irrigation systems to protect crops. Seawater farming should be promoted in coastal areas through the cultivation of Salicornia, Mangroves, Casuarinas and appropriate halophytic plants.

Advanced irrigation methods like sprinkler and drip irrigation should be practiced in large as they will not only protect vulnerable land but also increase crop yield by fifty per cent. In order to attain progress in agriculture at least half of the cropped area should be cultivated through proper irrigation system. Besides, education and aware measurements on preventing excess flooding of soil, regulations of groundwater for the sustainable use and water pollution control should be made mandatory to the farmers.



Credit and risk management

Credit reform is the essential requirement to increase farm productivity. Improved, easy and affordable credit access will facilitate the enhancement of crop yield. There is a dire need to extend the loan facilities and other subsidies to the farmers for their well-being. The lending interest rate in India is high. The need is to control the financial delivery system of both transactions and risk costs. Otherwise, the farmers will rely on money lenders, who in turn will exploit them to their advantage. Keeping in view the decline in profitability of agriculture, and the farmers' distress, the Government must introduce innovative policies

that balance the financial system with reduced interest rate. Moreover, credit may allow farmers to utilize their cash needs required for consumption induced by the agricultural production cycle. Though, governments are taking necessary steps to improve agricultural credit policies, the persistent regional imbalance in credit distribution over the years has immobilized the farmers from agro activities, which need to be resolved at the earliest.

Government should improve the accuracy and procedure of crop insurance as well as the debt recovery and settlement process. In order to mitigate and provide relief to the farmers in the dreadful event of droughts, floods and heavy pest infiltration, the government must step in to create a risk covering channel as rescheduling and restructuring of farmer's loans are not enough in the incident of successive natural calamities.

Supply of quality seeds

Seeds are the essential input for the prosperity of the farmers in any farm activity. Farmers should be supplied seeds of high-quality. Creating access to readily available quality seeds will enable them to continually reap the benefits of high-yielding varieties for longer period, by replanting the seeds harvested in each season. A team of experts for seed research and development should be formed in every zone. Development of quality and performance-oriented seeds should be carried on regular basis. A seed of high quality and technology helps to alleviate risks such as insect and climate pressure to some extent.



Awareness and technology usage

Farmers should practice advanced farming methods and technologies such as precision farming techniques, modern machinery, and innovative

irrigation systems for qualitative and quantitative agricultural output. Employing the inputs appropriately will save time and energy. Besides, farming operations can be simplified and labour work can be reduced. The foremost need for better and higher production is to spread the awareness regarding the various agriculture techniques. For this purpose, farming system orientation including crop-livestock integrated production systems is very crucial. This will create scope for economical farming and effective inclusive production. There must be an appropriate integrated relationship between production and post-harvest technologies. Post-harvest technology in dry farming areas where millets, pulses, and cotton are grown should be displayed to the farmers. It would help to raise their income which in turn stimulates the farmer's interest to adopt technology with sufficient income.

Marketing and transportation

The relation between commerce and consumption is vital for the growth and survival of the farmers. Marketing determines the economic feasibility of farming both as a means of income source and a way of life. A satisfactory remunerative sale will eventually promote the farming sector. Marketing facilitates the farmers to negotiate and sell their crops at the better prices. Government beside supportive intervention should also make an effort to bring market reforms especially in production planning. Better marketing infrastructure should be expanded in order to increase the flow and sales of agricultural products at superior prices. Facilities for unloading and safe storage of goods in the markets should be arranged properly. Besides, market information systems, Co-operative marketing societies, investment in marketing, value chains and agro-processing should be encouraged as this will enable diversification and minimization of consumer prices.

Market linkages are essential for farmers to generate new farm inputs and sell their products at better prices. To secure from the post-harvest loss, agricultural infrastructure should be upgraded. Adequate and appropriate transportation will ensure timely access to markets. Direct marketing channels should be encouraged to empower farmers for better prices.

Crop diversification

India's agro climatic condition has extensive variations due to its vast dimensions. Such variations are very useful for mixed agriculture. Crop diversification enriches crop productions, quality output and helps to safeguard agricultural biodiversity. Many agronomic benefits can be obtained through diversifications such as pest management, reduction of soil erosion and preservation of soil moisture. Moreover, concurrent cultivation of crops, animal caring, vegetables and fruits farming along with agricultural sustainability will also multiply pest fighting microbes in the soil conserving ecosystem.

While selecting crops, it is very crucial to assess the factors such as market demand, weather suitability, and advantages of crop rotation. Farmers to diversify the farm's produce should be able to use the resource efficiently and select the right crops to increase agricultural productivity. Crop diversification does not only mitigate risks associated with crop failure but also opens up opportunities for higher profitability through the expansion of market.

Government schemes

There is no denying that government of India always prioritizes the farmers' welfare. Now and then government is implementing several farmers' welfare initiatives, schemes, programmes and plans like National Agriculture Market, Pradhan Mantri Krishi Sinchai Yojana, National Mission for Sustainable Agriculture, Livestock insurance Scheme, Micro Irrigation Fund, Soil Health Card Scheme, Farm Bills and so on to revolutionize agriculture sector and to improve farmers economic conditions. These schemes aim to provide protection mechanisms to the farmers and against any eventual loss of their crop and cattle with the ultimate goal of attaining qualitative improvement in farm and livestock. Constrained spending will have adverse effect on agriculture productions and profit. In addition, it will limit the farmers from accessing new improved and advanced technologies ultimately causing low output and less income. The furtherance of farm activities is mostly depended upon government initiatives as it will encourage farmers to pursue more agricultural works and strengthen them to endure competition in the market. Otherwise, the increasing costs and expensive resources (technologies) will hamper the growth and development of agriculture in specific and the allied people in general.

Digital farming

Revolutionized and profitable farming can be achieved through technologies. The rise of global warming due to climatic change, often occurrence of heavy rains and floods, increasing production costs, labour costs, drought etc., constitute a major issue to the agriculture. To increase agriculture sustainability a designed set of smart agriculture practices needs to be adopted. In a bid, digital farming has emerged as a better and convenient mechanism for recording and analyzing the relevant farm data. Digital farming technology is served for artificial intelligence, block chain, remote sensing and geographic information system technology, use of drones and robots. It gives timely and valuable information to farmers, and as a result, they are alerted to bring about effective farm activities. Digitization even helps to subsume complete knowledge on variety of seeds and their effectiveness. Technology provides a multitude of alternatives that successively help the farmers formulate strategies accurately for productive and profitable results. Besides, digitization registers all the factual data that helps to demonstrate the credibility of the farmers having productive farming, thus ensuring more chances of getting loan.

Digital farming not only efforts to raise agricultural productivity but also promotes radical transformation of rural India. The impact of digitalization can widen the scope for a larger market, which is a big achievement in itself. Further, it renders great assistance to the institutions like insurance and banks in preventing bad lending and defaulters by transmitting precise information on the farm operations. Technology interventions provide farmers end to end services across the agriculture food value chain by forming an integrated channel.

Technical know-how

The knowledge about technology usage, pesticides, crop diversification, fertilizers, water management, soil management and other sustainable practices will enable farmers to resume farm operations effectively and efficiently. The resources can be promptly and accurately employed. For the purpose, agricultural research and extension experts or scientists should be assigned the task to educate the farmers about new and advanced farming techniques. This will help in

increasing awareness on agricultural productivity on the one hand and save time on the other.

VII. CONCLUSION

India is a global agricultural powerhouse. Agriculture is always at the center stage in the Indian economy. India is the largest producer of milk, pulses, and spices in the world. It is an epicenter of largest herd of buffalo. It is the second largest producer of rice, wheat, cotton, sugarcane, farmed fish, sheep, meat, fruit, vegetables and tea. The country's cultivation area of which 63 per cent is rain fed and 37 per cent is under irrigation. Any situational change in the sector, exercise a multiplier effect on the entire nation's economy. Agricultural sector contributes to the largest employment generation in India as more than half of the population is depended on agriculture.

The productivity of farms is essential for many reasons as it can bring about swift and sustainable reductions in hunger and poverty. When this happens, marginal and small-scale farmers and land less labours can spend the additional income largely on food and other products and services in rural areas, which tend to be produced and provided locally.

Agricultural development requires a major thrust in reform of agricultural research and extension. Several strategies have to be processed and implemented for attaining the desired outcome. Diversification helps to achieve more production and economic resilience of livelihoods through allied sectors, such as animal husbandry, forestry, and fisheries.

The escalation of greenhouse gas emission, high cost of production, heavy rains and floods are being a recurring challenge to the agriculture. Adopting climate-smart agriculture practices can help to attain agriculture sustainability and productive turnover. Therefore, the usage of digital farming technology provides numerous solutions that consistently aid the farmers to reap the benefit by framing operative and result-oriented strategies.

Government has been putting a concentrated effort to boost agricultural development. For the purpose, government has been introducing many schemes and providing initiatives now and then. These government initiatives will not only increase the productivity of agriculture but, encourage and strengthen the farmers to pursue more agricultural activities thus, more agro productions and empowerment to endure market

competition. In an effort to uplift agriculture and allied activities, 1.9 per cent of the union budget is allocated by the Government of India for this financial year. The Pradhan Mantri Kisan yojana offers 1.3 per cent to small and marginal farmers. Moreover, in budget 8.3 per cent was allocated to other significant subsidies, including food, fertilizers and petroleum.

Indian Agriculture is facing several challenges. These include sustainable farming investments, inaccessible irrigation systems, climate change, high fluctuations in prices and production, undeveloped markets, inadequate infrastructure, credit feasibility, relative profitability vis-a-vis other sectors, providing livelihood to large numbers, reduction in rural population, cost of production and market competitiveness.

The present study has emphasized the role of agriculture in India economy and challenges faced by agriculture sector with suitable measures to expand agriculture production. If implemented, the agricultural prosperity will be generated, more efficient distribution of scarce resources can be formulated, poverty can be alleviated and inclusive growth can be created in near future. Nevertheless, sustainability of agriculture still requires manifold and vital changes to justify economical and socially fair food production with environmental goals.

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