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भारतीय कृषि एवं खाद्य परिषद्

INDIAN COUNCIL OF FOOD AND AGRICULTURE

70 YEARS
OF
FARMERS' JOURNEY

EXECUTIVE SUMMARY

Agriculture and allied activities contributed nearly 50 percent to India's national income. Around 72 percent of total working population was engaged in agriculture. These confirm that Indian economy was a backward and agricultural based economy at the time of Independence. After 70 year of Independence, the share of agriculture in total national income declined from 50 percent in 1950 to 18 percent in 20016-17. But even today more than 60 percent of workforce is engaged in agriculture. In spite of this, the existing conditions of farmers are pathetic in country.

The stories of farmer's suicide shaken the nation in last two decades and the little impact of measures is also a point of concern for this country. After independence, nearly 70 percent of population engaged in agriculture but in 2011, this engagement reduces to 54 percent. Many schemes have been forwarded by government in seven decades but challenges in terms of infrastructure, climate, market, inputs etc. responsible for poor situation. The report highlighted the major challenges and issues accountable for farmer's suicide.

Various efforts have been taken by many organizations but there is need of strong policy to work in this direction and also to engage the farming community to come out probable solution with this challenge. The way forward presented in report impetuses on direct marketing, collectivization of farmers and innovation. There is also need to strengthen infrastructure to support agriculture. Indian Council of Food and Agriculture, encourages farmer's welfare in the nation and to adopt a proactive approach in discerning critical challenges emerging in Indian agriculture along with creating opportunities for development, value addition and international trade to augment farmers' growth and farm revenue.

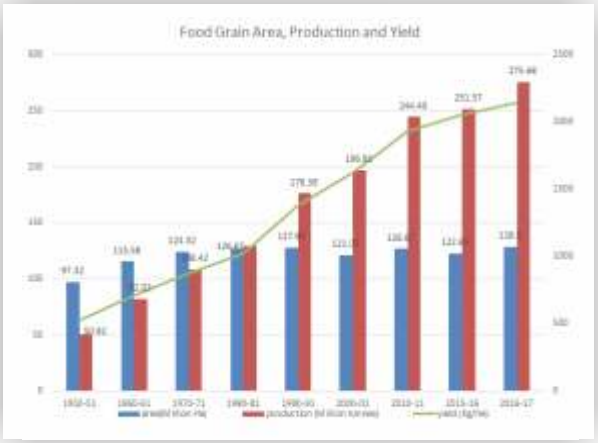
The report *"70 years of farmer's journey"* presents a comprehensive picture of Indian agriculture after independence to now in terms of farmer's situation and policies intervened during different phases. The report is presented here is the compilation of various reports and data showing the trend in last seven decades and also mentioned the challenges, issues and way forward to combat with the farmer's suicides and encourage the vision of doubling farmer income.

BACKGROUND

The history of Agriculture in India dates back to Indus Valley Civilization Era and even before that in some parts of Southern India. Today, India ranks second worldwide in farm output. Agriculture has always been pivotal for Indian economy since independence. The gravity of the sector is due to the fact that nearly 55% of population of the country derives its livelihood from the agriculture. It not only meet the food and nutritional requirements of 1.3 billion Indians, rather also contributes significantly to production, employment and demand generation through various backward and forward linkages. Moreover, it plays a crucial role in alleviating poverty and ensuring the sustainable development of the economy. Since independence, Indian agriculture has come a long way. From the state of food deficit to food surplus, the sector has witnessed various ups and downs.

AREA, PRODUCTION AND YIELD

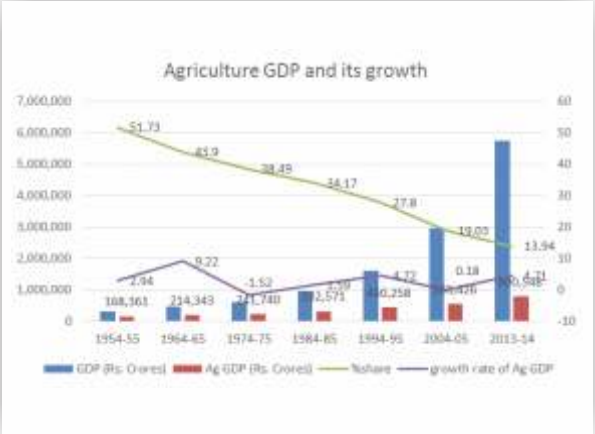
With advancement in techniques and technology, the average yield has increased from mere 522 Kg/ha to 2143 Kg/ha, which is four times greater than with which we started at the time of independence. Not only the production of food grains has increased but also the production of other crops besides food grains like sugarcane, cotton, oilseeds, jute etc. has also increased manifold.



Source: Agricultural Statistics at a Glance 2016

AGRICULTURE CONTRIBUTION IN ECONOMY

Even though the area production and productivity has increased but the share of sector in contribution to GDP has been continuously declining. The main reason behind is the rapid growth of industry and service sector in the country. The Gross Value Added (GVA) from agriculture for the year 2015-16(PE) at constant prices (2011-12) was Rs.1604044 crores, which was 15.4 % of the total GVA.



Source: Agricultural Statistics at a Glance 2016, Ministry of Agriculture and Farmers Welfare, GoI

EMPLOYMENT IN THE SECTOR

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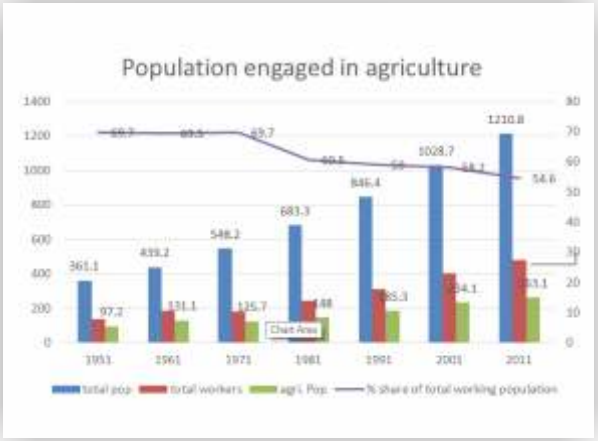
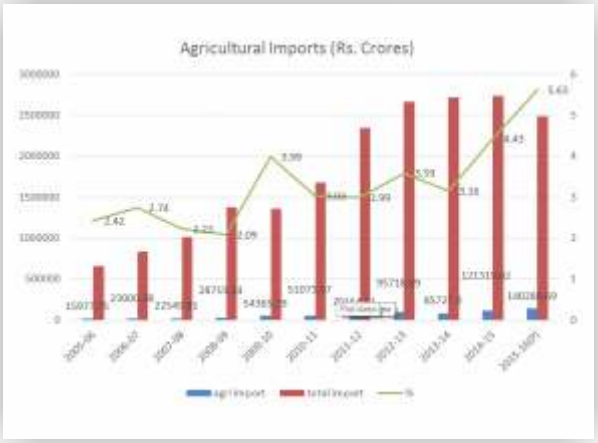
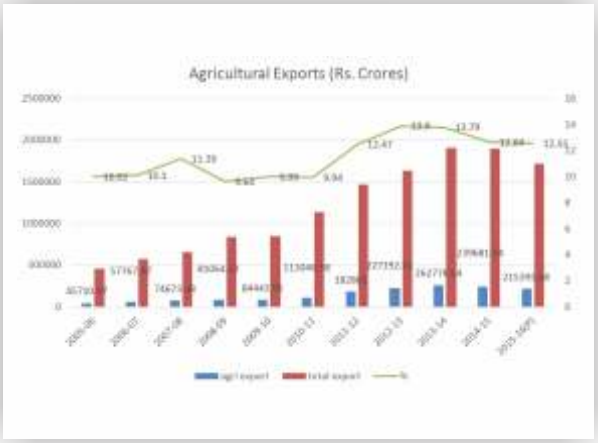


Source: Agricultural Statistics at a Glance 2016, Ministry of Agriculture and Farmers Welfare, GoI

AGRICULTURAL IMPORTS AND EXPORTS

Agricultural exports have shown an increase during the last decade from around Rs.45710 crores to Rs.215395 crores. Various efforts to encourage export of food grains in recent years through grant of World Trade Organization has led to India becoming one of the leading exporters of food grains in the international market. Also the imports of agricultural products have improved. The share of agri-imports to total merchandise imports in 2015-16 was estimated to be 5.63 per cent.





Source: Agricultural Statistics at a Glance 2016, Ministry of Agriculture and Farmers Welfare, GoI

Since agriculture provides employment to half population of this country but the other side shows the condition of farmer's in country still pathetic after seventy years of independence. The present report shows the glimpses of situtaion and policies in seventy years for this crucial segment of society and challenges prevailing by them.

THE FIRST FIVE DECADES

When India became independent in 1947, the agricultural productivity was very low (about 50 million tonnes). The agriculture was mainly rainfed and was being done as a subsistence farming using mainly animate sources of farm power and traditional tools and equipment's. More than 80% of the population living in rural areas was dependent on agriculture for their livelihood.

The Royal Commission on Agriculture in its report in 1928 had laid stress on harnessing science to develop and spread new agricultural technologies for the irrigated, arid and semi-arid areas. However, the quantum of efforts generated in agricultural engineering research and education till 1947 was microscopic in relation to the magnitude and diversity of the problems awaiting solutions. After Independence, India followed an agricultural development strategy that focused on self-sufficiency in staple foods like wheat and rice. Agrarian reforms were undertaken in the form of consolidation of holdings, abolition of landlordism etc. In initial decades the farmer's seems glorious position but policy paralysis, ignorant and poor vision leads to downfall of the condition.

SPLENDID PHASE (SIXTIES TO MID-EIGHTIES)

After independence when Five Year Development Plans were prepared in 1950, agriculture was given priority. However, it was only during sixties, when a number major schemes and program initiated in the country and investment was done for farmer's upliftment. Apart, the research activities in the field of agricultural picked up and got a boost during this phase.

In Sixties, Indian Prime Minister Lal Bahadur Shastri coined the popular phrase "Jai Jawan, Jai Kisan" and successfully launched the milk cooperatives, which later brought in the White Revolution; Prime Minister Indira Gandhi sowed the seeds of the Green Revolution. While the government imported high-yielding seeds of dwarf wheat from Mexico, and made available irrigation along with external inputs like chemical fertilizer and pesticides, farmers did the rest.

In 1967, the first harvest after the Green Revolution technology was introduced was a record three million tonnes higher. Since then the country has not looked back. From an era of food imports, India graduated to food self-sufficiency.

But what is little known is the financial impetus the government provided to farmers. In 1970, the Minimum Support Price (MSP) for wheat was only 76 Rs. per quintal. Giving a higher assured price to farmers as well as an assured market (by setting up the Food Corporation of India), the policy makers have to be appreciated for ushering in what was essentially a famine-avoidance strategy. For a country which witnessed 28 famines during the British Raj, the remarkable turnaround was only made possible by a valiant farming community.

The splendid period for farmers lasted for a decade-and-a-half. Although the Green Revolution had bypassed small farmers, an effort was made to paint a rosy picture of prosperity. The image of a progressive farmer driving a tractor was flashed as a sign of prosperity. In reality, the increase in production did not commensurate with an accompanying increase in farm incomes. While the successive governments were content with bumper harvests, farming as a community remained neglected. Coupled with a declining rate of public sector investments, the demise of agriculture began soon after the mid-1980s.

POLICY AND INITIATIVES:

Agricultural policy followed during this period can be distinguished in two phases:

- first phase considered from 1947 to mid-sixties,
- second phase considered period from mid-sixties to eighties

The first phase of agricultural policy witnessed tremendous agrarian reforms, institutional changes, development of major irrigation project and strengthens of cooperative credit institution. The most important contribution of land reforms was abolition of intermediaries and giving land titles to the actual cultivators. This released productive forces and the owner cultivators put in their best to augment production on their holdings. Land reforms were important in increasing agricultural production during this phase. The Community Development Programme decentralized planning and the Intensive Area Development Programmes were also initiated for regenerating Indian agriculture that had stagnated during the British period.

In order to encourage the farmers to adopt better technology, incentive price policy was adopted in 1964 and the Agricultural Price Commission was set up to advice the Government on the fixation of support prices of agricultural crops. Despite the institutional changes and development programmes introduced by the Government during this phase, India remained dependent upon foreign countries for food to feed the rising population.

The second phase in Indian agriculture started in mid 1960s with adoption of new agricultural strategies. The new agricultural strategy relies on high-yielding varieties of crops, multiple cropping, the package approach, modern farm practices and spread of irrigation facilities. The biggest achievement of this strategy has been attainment of self-sufficiency in food grains. Agrarian reforms during this period took back seat while research, extension, input supply, credit, marketing, price support and spread of technology were the prime concern of policy makers.

THE GREEN REVOLUTION

To make the country self-sufficient in food grains and reduce our dependence on imports, high input driven "green revolution" agriculture was introduced in the late 1960s in pockets of north western and coastal peninsular India. The green revolution package comprised introduction of high yielding varieties (HYV) of seeds, application of chemical fertilizers, pesticides and expansion of irrigation. The country had just faced a severe drought in 1967 but was able to achieve self-sufficiency in food grain production in a period of just five years.

While the self-sufficiency in Indian agriculture was highlighted by the proponents of green revolution, from 1970s the concept came under criticism both on socio-economic and ecological grounds. The main criticism directed against green revolution successes was that high yields could only be obtained under certain optimum conditions: decent irrigation, intensive use of fertilizers, and monoculture and pest control with chemical pesticides.

THE STAGNATION PHASE (MID EIGHTIES & NINETIES)

Another important facet of progress in agriculture is its success in eradicating of its dependence on imported food grains. Indian agriculture has progressed not only in output and yield terms but the structural changes have also contributed. All these developments in Indian agriculture are contributed by a series of steps initiated by Indian Government.

Land reforms, inauguration of Agricultural Price Commission with objective to ensure remunerative prices to producers, new agricultural strategy, investment in research and extension services, provision of credit facilities, and improving rural infrastructure are some of these steps. Notwithstanding these progresses, the situation of agriculture turned adverse during post WTO period and this covered all the sub sectors of agriculture.

By 1991, when the World Trade Organisation (WTO) came into existence, a complacent nation began to shift focus from agriculture. With Europe and America too building mountains of food, milk and butter surpluses in the same period, the dominant economic thinking turned to global competitiveness thereby reducing import tariffs to allow for cheaper imports. At the same time, the entire burden of keeping food inflation under control was passed on to farmers. Farm output prices globally remained frozen. According to an UNCTAD study, between 1990 and 2010, a period of 20 years, farm gate prices had remained static.

The dismal trend has since continued. While farmers were denied their rightful income, huge salary jumps were provided to other sections of the society. Wheat price for farmers on the other hand increased by 19 times in the same period. Agriculture turned uneconomical, and repeated demands for providing a level playing field fell on deaf years.

POLICY AND INITIATIVES:

The next phase in Indian agriculture began in early 1980s. This period started witnessing process of diversification which resulted into fast growth in non-food grains output like milk, fishery, poultry, vegetables, fruits etc. which accelerated growth in agricultural GDP during the 1980s. There has been a considerable increase in subsidies and support to agriculture sector during this period while public sector spending in agriculture for infrastructure development started showing decline in real term but investment by farmers kept on moving on a rising. The agricultural policy started after initiation of economic reform process in 1991. Economic reforms process involved deregulation, reduced government participation in economic activities, and liberalization. Although there is no any direct reforms for agriculture but the sector was affected indirectly by devaluation of exchange rate, liberalization of external trade and disprotection to industry. During this period opening up of domestic market due to new international trade accord and WTO was another change that affected agriculture. This raised new challenges among policymakers.

IMPACT OF GLOBALISATION ON INDIAN AGRICULTURE

Agricultural sector reforms and structural adjustments were initiated in India since 1990s after it accorded to the World Trade Organization (WTO) agreement to integrate with the global trade. Globalisation of Indian agriculture though intended to improve the efficiency, productivity and cost competitiveness has had adverse impacts with both growth rate in agriculture as well as employment in rural areas declining during the post reform period (from 1990s till date). The growth in agriculture GDP which stood at 4.7 per cent per annum during the 8th Plan (1992-97) progressively declined to 2.1 per cent per annum during the 7th Plan (1997-02) and 1.8 per cent per annum during 10th Plan (2002-07). Public investment in irrigation and other related infrastructure necessary for agricultural growth declined. Growth rate in agricultural employment in rural areas was 1.38 per cent during 1983 to 1993-94 which declined to 0.12 per cent during the post reform period of 1993-94 to 2005-06. Reduction in public sector investment in agriculture, failure to encourage sustainable farming practices, and unremunerated prices for agricultural produce were among the factors that turned agriculture into a losing proposition. The damage was more pronounced in cash crops like cotton. Farm suicides began as a trickle around 1987 or so and since then have taken a toll of nearly 3 lakh farmers in the past 17 years.

THE LAST TWO DECADES

THE NEGLECTED PHASE

Farm suicides are the outcome of the continued neglect and apathy of the farm sector. Besides the policy makers, a significant role is also played by agriculture scientists and economists. They cannot simply absolve themselves from the terrible agrarian crises that have prevailed for almost two decades now.

About 20 years after the Green Revolution began, and somewhere in the early 1990s, the global economic thinking shifted to shrinking agriculture and boosting industry. World Bank/IMF and the international financial institutions began to propose that economic growth can only take place when fewer people are left in agriculture. In 1996, the World Development Report of the World Bank suggested moving 400 million people, equally to twice the combined population of UK, France and Germany, from the rural to the urban areas in India in the next 20 years, by the year 2015. Meanwhile, the emergence of World Trade Organisation in 1995 also shifted the focus to trade. The mainline economic thinking shifted to reducing support for agriculture and importing highly subsidized cheaper food from the developed countries. Subsequently, the World Bank and Multinational Corporations have been pushing for land acquisitions, contract farming, and creation of super markets or in other words paving the way for corporate agriculture. In other words, the neglect of small scale agriculture is part of a design. It is part of a pre-planned economic strategy that is being imposed.

The state intervention in agricultural sector rendered large masses of small and marginal farmers vulnerable as they found it difficult to compete in global markets. The farmer is faced with multiple threat from all fronts –uncertain yield, uncertain price, input (spurious quality) and technology (limits to groundwater draft). Agriculture products are being increasingly dumped from developed countries into India. To make agricultural markets responsive and to allow contract farming, the Agricultural Produce Market Committee (APMC) Act was revised. Restrictions were removed on futures trading on many commodities and Foreign Direct Investment (up to 100 per cent) allowed in many agribusiness sectors. Agriculture became a riskier and a low return activity. The increase in input costs far outweighs the increase in output prices and rise in productivity leading to agricultural profitability rates going down (CACP, 2000). In addition, agricultural diversification by small and marginal farmers towards high value crops rendered them food insecure and added to malnutrition problem.

NATIONAL AGRICULTURAL POLICY

India's first comprehensive policy statement related to agriculture dates back to 2000 (National Agricultural Policy (NAP)). The policy statement aims at a growth rate in excess of 4 per cent annum in the agriculture sector, efficient use of resources, regional equity, demand driven growth that caters to domestic markets and maximum benefits from exports of agricultural products in the face of challenges arising from economic liberalization and globalization. The key agricultural related programmes of the government today are the National Food Security Mission and Rashtriya Krishi Vikas Yojana.

India also came up with a National Farmers Policy in 2007. The National Commission on Farmers states that "There is a need to focus more on the economic well-being of the farmers, rather than just on production. The aim of the National Farmers Policy is, therefore, to stimulate attitudes and actions which should result in assessing agricultural progress in terms of improvement in the income of farm families, not only to meet their consumption requirements but also to enhance their capacity to invest in farm related activities."

The Nation needs to double Farmers' Income by 2022.

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THE DARK SIDE

As per a report publish in The Hindu, the country has seen over a quarter of a million farmers' suicides between 1995 and 2010. The National Crime Records Bureau's latest report on 'Accidental Deaths & Suicides in India' places the number for 2010 at 15,964. That brings the cumulative 16-year total from 1995 to 2, 56,913, the worst-ever recorded wave of suicides of this kind in human history. Maharashtra posts a dismal picture with over 50,000 farmers killing themselves in the country's richest State in that period. It also remains the worst State for such deaths for a decade now. Close to two-thirds of all farm suicides have occurred in five States: Maharashtra, Karnataka, A.P., Madhya Pradesh and Chhattisgarh. The poor farmer has been left to live in debt, which keeps on multiplying with every passing year. The economic crisis farmers are facing is compounded by the denial of a rightful income to farmers for his produce. The farmers have paid the price to keep food inflation under control. In reality, it is the farmers who have been subsidizing the nation all these years. Successive governments have therefore deliberately kept agriculture impoverished. An estimated 58 per cent of the farmers go to bed hungry every night.

Agriculture is being killed deliberately to keep economic reforms going. To achieve economic growth, mainline economists tell us that it is absolutely essential to move bulk of the population from agriculture to the cities. Food can be produced by promoting corporate farming or can be imported. Policy support, production strategies, public investment in infrastructure, research and extension for crop, livestock and fisheries have significantly helped to increase food production and its availability.

ISSUES AND CHALLENGES

MAJOR ISSUES

There is a wide array of factors that has led to the increasing spate of farmer suicides in India. The lands are not as productive as before, the markets are failing, the debts are piling up, and the pests cannot be kept at bay. More than an economic problem, this has now assumed political and humanitarian dimensions, especially since the past decade.

Issues of weather and climate

The weather in India these days has become erratic at best and rainfall does not happen at the right time. Moderate rainfall, which is needed so much for proper agriculture, is now becoming a thing of the past and things have reached the extreme. The situation is especially bad in Central India, which can be regarded as the agricultural heartland of India. The problems are exacerbated by the fact that 85% of precipitation in India happens because of rainfall. If there are sustained repetitions of dry spells then there can be some massive crop loss.

Scales of operation

Majority of the people who have their own land to till have got it from their ancestors. Since more often farmer's land is divided among his sons, it leaves precious little for a farmer. This is the reason that the scale of operations here is so small. The problem of small landholdings is acutely felt in states with high population density like Kerala, Bihar, West Bengal, and eastern Uttar Pradesh. The gap between small farmers, big farmers or landlords, and medium farmers or peasants is huge. A lot of time and resources are wasted every time a fragmentation happens and it reduces output since it is highly difficult to properly cultivate such small pieces of land.

Lack of farm labour

These days farm labour is regarded as demeaning, especially casual labour. Sectors such as construction and industries are already employing people, who would otherwise be engaged in agriculture. This is also one reason urban migration has increased so much in the last few decades. The government system of minimum support prices, which has resulted in inflation and increased the wages.

Unsatisfactory realization of prices

One of the most crucial problems faced by farmers in India is regarding marketing. The laws in India are outdated and most often a farmer has no option but to sell his produce in regulated markets, where the middlemen are the ones making the maximum gains. In some situations the farmers also need to give away their produce for free to the moneylenders. Distress selling in small villages is a pretty common phenomenon as well.

Inadequate storage facilities

As per ASSOCHAM estimates each year 30-40% of the entire agricultural produce in India is damaged because there are not enough cold storages. In monetary terms, this translates to INR 35,000 crores. Farmers who do not have cold storage faciiity have to sell their produce as early as possible so that they do not rot. This means they are sold at a loss since supply exceeds demand by some distance.

Quality of seeds, pesticides, and fertilizers

Farmers in India have to often make do with poor quality seeds. There are many reasons for this sorry predicament – ignorance on part of farmers, corruption of officials, ineffective and coercive laws, and improper enforcement of the same. The fertilizers and pesticides that they use are of a poor quality. All these factors often lead to complete loss of crops.

CHALLENGES

Indian farmers are facing bigger problems than the Govt, anticipation. Attitudinal problems are one concern, as many of individuals don't think farming as respectful profession, now a day farmers are adopting this occupation not by choice, but due to sustaining life at minimal level.

PRE HARVESTING PROBLEMS

- Awareness among farmers is key factor, as many of the farmers are still not aware of new and modern technique of agriculture and old aged farmers are reluctant to adopt new ways of farming. Though the Govt. has taken several initiatives in this regard such as Kisan Mela, information on Mobile, Using digital means to spread information and create awareness among farmers but the active participation of farmers is crucial for its success.

- Lack of motivation: There are certain cases where farmers having knowledge but they don't want to try new crop as they believe sowing new crop decision can turn out to be bad. They are moreover risk averse. Risk averse capacity though depends on the size of land holding of farmers, small farmers are more risk averse than big farmers. Though Govt has assured in this regard through new schemes such as crop insurance i.e., Pradhan Mantri Fasal Beema Yojana but due to poor implementation of these schemes farmers are still in dilemma.

- Migration of agricultural labour is another critical issue which is farmers is facing, in small places and villages labours which were earlier involved in farming, now they are migrating for better livelihood opportunities where introduction of new and modern machinery has emerged a crucial need for that.

- Irrigation related problem: In India still majority of farmers are dependent on Monsoon which is highly unpredictable in nature itself. Still many of states are facing drought consecutive years and some on alternate years which became critical challenge for farming. Dependency on Monsoon must be decreased. In Some of the states where farmers relies on diesel pumping set for irrigation and due to higher cost of fuel it also became unaffordable for small farmers. In many of regions there are canals but they are also not being managed properly. In spite of sufficient water in rivers canals are facing huge water crisis.

- Govt. Support and Incentives: In recent times price of input costs has risen due to higher rate of inflation like as last year inflation was risen at rate of 6.3% on an average whereas minimum support price for wheat increased only at rate of 3.07%. On other hand Govt is reducing the subsidy on this sector, due to these factors farmers are finding farming less lucrative and their orientation is shifting largely.

POST HARVESTING PROBLEMS

- Storage Issue: Farmers are facing several problems even after harvesting the crops, though they deposited a surplus growth in their production, there is acute shortage of cold storage and storage for food grains so that farmers are facing huge difficulty even after a good production year.

- Market access and Information: Govt of India has initiated m-krishi and other digital initiatives for spreading the market communication among farmers so that they should be well aware the market demand and prices and they get their best prices, it includes where the adjacent Mandi and local market places is. But still due to lower rate of literacy among farmers these are less effective. So, for Govt it should be foremost priority for increasing awareness and realizing the market access.

- Famers Debt and Loan: Farmer suicides are a problem in the country and the crops are heavily dependent on many factors from climate to soil conditions. The success of the loan waiver lies on the extent to which the benefits reach the needy farmers. Loan waivers suffer from several drawbacks in this respect. First, it covers only a tiny fraction of farmers. Secondly, farmers investing from their own savings and those borrowing from non-institutional sources are outside the purview of loan waiver. Loan waiving excludes agricultural labourers who are even weaker than cultivators in bearing the consequences of economic distress.

THE WAY FORWARD

Indian farmers are facing great challenges, while income from farm activities is dwindling due to higher input costs and errant weather, quality of natural resources such as soil nutrient and water level is also degrading at a fast pace. Number of farmers also declined over the years meanwhile whereas demand for grains and food is rising and other hand land resources are shrinking due to rapid urbanization. It is clearly evident that as all these challenges are interlinked and hence it must be tackled simultaneously.

In this context the key requirements are to substantially increase public investment in agriculture and allied activities, ensuring better price to farmers, reducing input cost through innovation in agricultural techniques, promotion of climate resilient crops varieties, better and more local storage and distribution of food grains, improvement of soil and water quality, promotion of integrated and contract farming, incentives for organic farming, better market access and information etc.

Implementation of reforms is crucial in making any plan effective and delivering the intent in all its aspects. Many outlooks published by agencies like United Nations and the United States Department of Agriculture had termed the main focus areas of Indian agrarian economy with two major issues, where raising required returns for farmers and reducing costs for buyers are addressed.

What is required for a better growth is market integration. Fragmented markets are the result of notified area of agriculture produce marketing committees. They do have an undesirable impact on the competitiveness of agricultural marketing system. Commodity exchange for future trading of commodities created a single, nationwide market for various agricultural commodities through an online trading platform

Increasing farm income through direct marketing

Increase farm Income through direct marketing: Farmer's income is the basically difference between input cost and their selling price of their produce in the market. Due to rising of input costs which includes seeds, fertilisers, pesticides, fuel to draw out water and machinery the profit of the farmers is declining, on contrary income from non-farming sector is increasing at higher rate.

Though Central Govt announces every year assured MSP for wheat, rice, sugar cane and cotton but it also comparably lower than the rising input cost, and also for other food grains such as pulses there is not assured MSP, which made diversification fail.

Another problem is that wholesale markets having long chain of intermediaries which resulted wide gap between producer and consumer prices. Henceforth Direct marketing which removes the intermediaries and would provide better price to farmers needs to be promoted. Farmers market has shown good result in case of vegetable and it promoted diversification so, same can be replicated in food grains.

Market Access to farmers

A single seamless market for agriculture commodities in the nationwide market may not be a single solution for entire agri-marketing issues. It will still play a major role for better results. Buyers accepting common commodities at unified prices throughout the entire nation can never be termed as a bad idea. The National commission on farmers had observed that the density of APMC is poor and it would be helpful if the market is within five kilometres from the farmer's residence or farm field. This policy can be used to connect farmers' to the market field

Warehousing and Logistics System

Presently, there is only limited warehousing capacity in the country, having local procurement, storage and distribution network, efficient logistics system will gradually reduce costs on logistics and other activities. For that every state can start networking of Mandis and adequate storage facilities can be ensured through involvement of Gram Sabhas and Women SHGs. Storage infrastructure can also be adopted with allied facilities such as farm produce and quality control.

Post-Harvest Storage

This storage infrastructure can also come with allied facilities like processed farm produce and quality control. Formal credit system and insurance against crop failure are yet to make the expected impact on the farming landscape in India. Coverage of all crops under insurance and availability of credit on easy terms can go a long way in ensuring financial security. But more than that, having multiple income sources on a single farm, like beekeeping, cultivation of herbs, agroforestry, poultry and livestock rearing, are good cushions against crop failure. Direct income to farmers through a government panel on lines ofpay commission is another concept finding favours of the Karnataka government and can go a long way in checking migration of farmers to other sectors if implemented properly

Farmer Producer Organisation

The percentage of market surplus is high in most of the crops. Absolute figures might be small due to the predominance of small and marginal holdings but it affects scale economies which is an important factor in the marketing of agricultural produce. Only uneconomical sizes may raise transportation and other related costs. In that case, cooperatives may increase chances as small holdings may not give a chance to bargain. So, formation of FPO should be accelerated.

Reduction in input Costs and Conservation of Resources

Modern perception which made agriculture as an individual enterprise whereas in old days farmers helped each other and shared pool of capital expenditure and got a portion of produce in return. The only solution to check rising input costs is to make farming a collective enterprise. Hiring of implements through local farmers' cooperatives would not only cut down expenditure on machines but also fetch extra income for the farmers. Similarly, linkage between formal and farmer-saved seed systems through local enterprises would reduce costs and promote scientific temperament among farmers to develop new crop varieties.

Promotion of Organic Farming

Stress on organic manure, natural ways of pest control and mulching of crop waste and weeds in the field should be promoted. Incentives to farmers who take to natural or organic farming and adequate marketing linkages for their produce will cut expenditure on fertilizers, pesticides and other chemicals. Organic manure, vermi compost, incorporation of legume crops and mulching will also help replenish the depleting soil health and fertility besides improving soil moisture thus requiring less irrigation.

It's a quite clear that holistic methods like organic farming don't offer a quick fix and demand a long-term commitment which is why incentives to cover the reduced income during the transition period would be required. Sikkim has set an example and became India's first organic state.

Promotion of Integrated Farming and Contract Farming

Integrated farming that can sustain a family is possible even if one owns a piece of 10-cent land (one-tenth of an acre). Contract Farming had been given much prominence in the model APMC act, and very much remained a focus area of the model APLM draft 2017. It had been in practised for quite some time in India. Seed production by seed companies and sugarcane production under catchment area of a sugar producing unit are few classic examples of contract farming in India. Contract farming as done by Pepsico in Punjab for tomatoes or Mc-Cain for potatoes in Gujarat can be replicative model, which can help to get farmers' new technology at affordable scale. Contract farming could set a potentially very good example in this direction.

Availability of Water

Water availability per capita has declined from 5000 cubic metres (m3) per annum in 1950 to around 1800 m3 now and is projected to decline to 1500 m3 by 2025 leading to far less water availability for agriculture. The water availability for agricultural use has reached a critical level as the country uses more than 80 per cent of the surface water for this sector alone. On the other hand, inefficient and dilapidated canal irrigation systems have led to a spurt in groundwater development. India is the largest user of groundwater in the world with over 60 per cent of irrigated agriculture and 85 per cent of drinking water supplies dependent on aquifers.

Conservation techniques like zero-tillage, raised-bed planting, precision farming and drip or sprinkler irrigation have shown good results in soil and water conservation but needs further improvement in technology for wider acceptance. System of Rice Intensification (SRI) has caught imagination of several farmers especially in Bihar and Andhra Pradesh as a water-conserving method of paddy cultivation. The technique needs a bigger push from the Centre to make it a universal concept. On policy level, attempts are being made in states like Maharashtra to secure water rights to users (including agricultural users), have tradable water rights and in the process privatise water.

Adaptation to climate change

Unexpected weather conditions and changing rainfall pattern have been noticed all over India especially in last few years. These events upset the calculations of farmers thus affecting the normal sowing and harvesting cycle of crops which leads to lower yields. To deal with this scenario, not only the farmers need to take to weather-resilient crops, government also needs to equip them with appropriate information. Strengthening climate risk information and tools should be accorded top priority to minimise crop losses on account of disasters. Weather forecast should be prepared at block level with village level outreach.

Promotion of weather-resistant crop varieties like flood and salinity resistant rice and drought-resistant pulses should be promoted and further improved. Likewise short-cycle crops of particular region which can withstand heat and ripen before heavy rains should be given due recognition. Narendra 97 is a good example of a short cycle paddy crop grown in Uttar Pradesh that can deal with intense heat and ripens in a shorter period than the commonly cultivated paddy. It has proven effective in flood prone areas. Millets, one of the major grains of Indian landscape, have been pushed back because of preference given to wheat and rice. However, these coarse grains are known to grow in hard conditions and are our best bet against climate change. A compilation of such crops should be created, disseminated and field-tested in different parts of the country. Mixed cropping like growing paddy with pulses, millets and vegetables should be promoted to ensure food security in case one of the crops fail due to drought or floods.

Graduating farmers to farm entrepreneurs

Graduating the farmers towards entrepreneurship through set up agri business and agriclinic centers could enhance the situation and enable them to decision making. New resources like an information technology system and a national network of farming experts allow farmers to maximize their use of agricultural knowledge. Raised on a farm, trained as an agricultural commodities broker, and inspired by the power of information to improve the lives of Indian farmers.

Efficient Market level Information and usage of ICT

ICT can be and effective tool for bringing information revolution in Agricultural sector. Govt already initiated some of the schemes such as m-Krishi, dedicated channel for farmers but still farmers are not getting the correct information such as local market, rates of their produce in mandi, competitive pricing for their produce and other information. Lower level of literacy is another difficulty for this. ICT can be change agent as the mobile base in India is increasing at very fast rate even in rural areas

Doubling Farmer Income and Strengthening the Repayment Capacity

In the longer run, doubling farmer income as envisioned by Hon'ble PM Shri Narendra Modi and strengthening the repayment capacity of the farmers by improving and stabilizing their income is the only way to keep them out of distress. The sustainable solution to indebtedness and agrarian distress is to raise income from agricultural activities through improving productivity in agriculture through improvement in irrigation, mechanization, availability of quality seeds, fertilizers, pesticides, crop diversification towards high-value crops and solving ethical dilemma related to GM crops.

Secondly, we need to undertake agriculture market reforms to ensure that farmers get reasonable prices for their produce; this includes amendment to state level APMC acts.

Thirdly, we need to increase the coverage of PM fasal bima yojana so that farmers are guarded against the risk of crop failure. Fourthly, there is a need to encourage non-farm income avenues like animal husbandry.

Farm loan waiver may give immediate relief to farmers from mounting debt. This might be necessary as it is not farmer's fault but bad monsoon and faulty market structure of output which has increased farm distress with consequences like increased farmer suicide. However, farm loan waiver could not be use as a state policy as it increases debt; shatters credit payment culture and make farmers dependent on states. The sustainable solution lies in structural agriculture reforms.

As is evident, Indian farming is facing several daunting challenges but the solutions are also at hand. However, these would only be successfully implemented when involvement of people is ensured as decision makers, monitors and evaluators.

भारतीय कृषि एवं खाद्य परिषद्

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