

Chapter 9: Challenges in Agriculture

Short Answers

CSM 05: Agriculture

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This chapter contains:

- Restrictive Policies- Liberalisation
- Infrastructure constraints
- Climate Change – compounding agricultural risks
- Farmers' Welfare
- Planning and Review – Institutional Arrangement
- Grassroots Level Participatio
- Investment Pattern in Irrigated and Rainfed States
- India - Subsidies in Agriculture
- Inflation Management
- Mobilising Farmers

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1. Restrictive Policies- Liberalisation

Why Liberalisation?

The production system is a function of deployment of various inputs. Of the several inputs deployed in agriculture, some of the more important ones are seeds, fertilizers and pesticides. The latter two include both inorganic and organic based. The cost of cultivation / production is determined amongst others by the quality of the inputs that the farmer purchases and the price at which he makes the purchases. The shift of farming from the traditional / conventional system to the modern has linked agriculture to marketing more than ever before.

A large part of the agricultural production system today is driven by market forces. The farmer purchases most of his/her input materials like seeds, nutrients and pesticides from the market. Hence, both quality and cost of inputs become critical, if the overall cost of cultivation is to remain rational and help increase the net farm income.

As regards post-production management, the environment for handling and monetising the agricultural outputs has to be conducive enough to encourage capture of optimal value and enhance the farmers' reach into markets.

An open and liberalised environment for manufacturing and distributing the inputs is likely to introduce competition and offer alternate options to the farmers to make a choice. It is also likely to incentivise innovations for introduction of new and more suited types of inputs, and also make them available to the farmers at a more reasonable cost, as a result of competition. However, some regulation will be required to ensure that these critical inputs are available at right time, in accordance with right quality and at rational price. There has to be room for checking any probability of malpractice. After all, these inputs are critical to crop and livestock production and therefore essential in nature.

Output management encompasses rules relating to trade & stock limits, and scope for free market. Hence the need for a more liberal regime of stock limits and policies that facilitate market participation by a wider stakeholder base.

Reforms in Critical Inputs and Markets

There are 3 (three) critical inputs, that need to be addressed for making them available to farmers at cost-competitiveness and in adherence to quality standards. These are:

- Inputs

- ♣ Seeds
- ♣ Fertilizers
- ♣ Pesticides

- Market Reforms

Seeds are the seeds for growth

Seed constitute the starting point of a crop production system and the vigour & quality of seed circumscribes the limits of output can one can harvest. Of course, it is equally important that a conducive growth environment is provided for the seed to express its genetic potential wholesomely. India's seed industry has grown appreciably in size and level of performance in the past five (5) decades. Both private and public companies / corporations are involved in production of seeds.

Recommendations for improving the seed sector

There exists lot of scope in effecting improvements to the existing seed production system in particular, and seed sector in general. Some following suggestions are made in this context:

i) Need for higher Seed and Varietal Replacement Rate

For achieving the desired levels of Seed Replacement Rate (SRR), adequate seed of good variety has to be produced. Each state needs to prepare a State Seed Plan to meet the region – specific requirements. The list of recommended varieties must be revisited and finalized in consultation with the scientists of the State Agriculture University, ICAR Institutes in that region, Crop Coordinators, State Agriculture Department officials and the seed producing agencies. Seed production programme should be organized in each State under a comprehensive and integrated State Seed Plan appropriate to different regions. The states should ensure production, multiplication and replacement of seed to increase VRR and SRR progressively, particularly in respect of regionally important crops/varieties. Varietal Replacement Rate (VRR) is as important as SRR.

ii) Replacement of older varieties with newer varieties

A review of existing list of released and notified varieties reveals that many old varieties (more than 15 years) still find place in the recommended package of practices. Continued use of old varieties is non-productive, and should be replaced by new ones, and must be brought into seed chain system on priority. SRR does not ensure high productivity if the variety is old and has developed vulnerabilities to external factors. A rigorous exercise to weed out all old varieties should assume priority.

iii) Promoting hybrid technology

Promotion of hybrids/ HYVs of major field crops should receive a high priority, so as to bridge the productivity gap and increase production. In this context, both public and private sectors have to play a major role, as seen in the case of maize. For accelerating hybrid seed production, the present system of receiving indents of notified hybrids by the public/private sector needs revision by including larger number of indents for the parental lines of the hybrids.

iv) Public-Private Partnership (PPP) Models

Partnerships between the public research institutions and private sectors are desired in R&D, as also production and distribution of seeds to the farmers. A collaborative technology park for carrying out research for development of new varieties may be established by adopting PPP models.

v) Use of Intellectual Property Rights (IPRs)

The facility of IPR for new and innovative technologies can incentivise investments in R&D in both public and private sectors. Public sector research system should also protect its varieties through PPV & FR Authority and generate the revenues which can be ploughed back into the system as R and D investments.

vi) Stronger enforcement

The Seed Law Enforcement wing of state governments needs to be strengthened. The Seed Inspectors have to be well trained for effective enforcement of various provisions of Seeds Act, 1966, Seeds (Control) Order 1983, Environment Protection Act, 1986 and Consumer Protection Act, 1983. They will need continuous upgradation of knowledge to be effective in checking spurious seeds. In addition, there is need to deploy suitable technology like bar coding etc. Adequate number of seed testing laboratories are also needed.

vii) Strengthening of Seed testing facilities

Most State seed testing laboratories suffer from inadequate manpower and poor infrastructure facilities. They are required to be strengthened both in terms of manpower as well as technical capabilities. Their performance has to be monitored periodically with reference to the preciseness and reproducibility of the test results.

viii) Uniform procedure in the country for seed licensing

Under the Seeds (Control) Order 1983, every seed dealer has to obtain the license from the State Licensing Authority. Under Clause 5 of the Seed (Control) Order, a licensing authority after making such enquiry as it thinks fit can grant a license to an applicant. This provision is interpreted differently by the state governments, seeking varied nature of

information/documents which is not a business-friendly environment for those companies doing business is more than one state. It would be useful if central government develops a Model Guideline and Procedure for the states to adopt the same.

ix) Enhancing export of seed

India has the potential to become a leading player in seed business if it can tap the demand in developing world. Many of these countries have limited availability of hybrid seeds and the Indian crop germplasm has light potential of adaptability in these countries. This is a huge business opportunity available to the Indian seed players. The present share of India in global seed market is less than 2 percent, which can be easily scaled up by harvesting the market in African, SAARC and South-East Asian countries. India can achieve the target of 10 percent of the global trade by 2020, as envisaged in the National Seeds Policy 2002. Some of the Indian / MNC seed companies are already doing business in some of these countries, which can be further expanded. For this to happen, the seed industry will need to be facilitated by simplifying the procedures for obtaining export permits etc. Further, the EXIM policy has to be steady over reasonable period, for private traders to establish long term business relationships.

x) Seed Quality Assurance

Seed quality assurance requires considerable investment in terms of proper infrastructure, equipment and competent human resource. Seed certification agencies, have to be adequately equipped and made more efficient for certification of quality seeds. The Seed Testing Laboratories should be strengthened and accredited by the International Seed Testing Association (ISTA).

2. Infrastructure constraints

The status of infrastructure, 'in' and 'for' agriculture, plays a prominent role in the pace of change that can be achieved in agriculture. Investment in basic support infrastructure, such as roads, irrigation, electricity, etc., is critical to achieving of the desired higher growth rates. This support infrastructure is the back-bone for other infrastructure components in agriculture, such as markets and the associated agri-logistics.

The basic support infrastructure not only facilitates production and productivity, but also provides the platform to build backward and forward linkages, between farms and markets. Without such facilitation, the farmers and the nation stand to lose on the gains made through productivity enhancement and production growth. Investment in infrastructure is evidently important to enhance the technical and financial viability of farming, from angles of both agribusiness economics and sustainability.

Absence of infrastructure is a basic constraint and needs to be addressed. It must also be understood, that private corporate sector investment also follows public expenditure in rural roads and energy. Data shows that the bulk of private sector investment in agriculture has happened by farmers themselves. This investment is largely for their enterprise related activities like land development, small irrigation etc.

Public investment in rural connectivity (roads, transport, electricity, communication) allows for a growth in the traffic of agricultural produce, from farms to markets. Greater involvement of the corporate sector is desired to organise and integrate the flow of agricultural goods and commensurate value. This optimal blend, in turn, organises the overall input and output supply chain making for an optimised agri-value system. The current measures of marginal effects, from public investment in rural roads-transport, energy and communication, on farmers' income, may not be fully capturing the growth from associated investment in agri-business, marketing, and the growth in productivity that also accrues.

The accelerated momentum in public investment needs to be increased to achieve the targeted rate of 16.45 per cent, spread over the various heads in agriculture. A holistic approach to fill the gaps and bring convergence in the resources available across different public sector agencies, as also in the private sector should be adopted by the states. For example, investment in irrigation and energy must be met with commensurate investment in roads and in modernising marketing infrastructure. An apt measure of outcome to adopt is the growth in income or the total quantity of production trafficked.

A good strategy to adopt is to have private investment targets linked to public investment spending. Currently, the added investment in the seven years after 2015-16, by public and

private sectors, is Rs. 102,269 and 46,298 crores respectively (a ratio of 1 : 2 approx.). Apart from ongoing private investment by farmers, there is little investment by corporate sector. Since, corporate private investment would, to a significant level, be linked to availability of basic infrastructure, the States can have a target equivalent to at least 10 per cent of the public investment made in agriculture. This will drive emphasis on making public investments in appropriate supporting infrastructure, as needed by the private sector to plan and make their own investment in agri-business projects.

Public investment measures can include factors or indicators that link to increased corporate sector investment in agriculture, especially in agri-business areas (market upgradation, agrilogistics, agro-processing, etc.). This will also bring about an increase in the marginal effects of public investment and lead to greater use efficiency of public capital invested.

This Committee has recommended a Division of Investments and Enterprise as part of restructuring and reorganising of Divisions in the Ministry of Agriculture and Farmers' Welfare. A similar approach is suggested to the States. It must be noted that guiding public investments 'for' agriculture and promoting investments in agricultural enterprises and will be vital to achieving the agenda of doubling farmers' income. It is noted that currently the scheme implementing agencies, whose achievements are guided by financial and physical targets, are also loaded with related policy formulation responsibilities. This, at times tends to disallow the necessary holistic intent and outcome based approach in policy making. Segregating implementation activities from policy making, will help make the policies more outcome oriented and allow for better monitoring of the implementation. Tasking a separate division with the charge of integrating investment policies 'in' and 'for' agriculture will be beneficial way forward and provide suitable impetus to capital formation in agriculture.

3. Climate Change – compounding agricultural risks

Agriculture continues to be fundamentally dependent on the weather and will remain sensitive to short term variations in weather and to seasonal, annual and long-term changes in climate. Climate change is not just the warming of air temperature, but the linked long term alteration in established weather patterns. The change manifests initially in weather disruptions such as un-seasonal rains, winds, floods, droughts, extreme warming or cooling and other incidents. Over the long run, it can cause a drastic shift in the agro-ecology with flora and fauna forced to adjust their life cycles or turn extinct.

There are many examples of how extreme weather events have impacted farmers in the short term, such as when (to mention a few):

- lakhs of poultry died in May and June 2003 in Andhra Pradesh due to heat wave;
- high rainfall in 1998 & 2005 (> 1500 mm) affected kharif and late kharif crop of onion and damaged rabi nursery;
- cold wave in north in 2006 caused frost and ice damage to crops;
- flowering occurred on already bearing mango trees in Bengaluru in February 2010; and
- heat wave causing lower milk yield from cattle and fish mortality in shallow water ponds.

These and many such instances on record, are occurring more frequently and unpredictably, and are seen as indicators of changing atmospherics. When such extremes in weather become more frequent or a norm, then the impact is permanent on agriculture. Scientists all over the world agree that climate change is occurring, and its full impact is yet to be realised.

Impact of Climate change and change management

Agriculture a biologically controlled activity is totally dependent on climate. It is over the millennia that the current global agricultural systems have evolved as shaped by nature. The changes effected to these naturally evolved agricultural systems by science and technology, particularly in the last two centuries have made only marginal and cosmetic changes to the creations of the nature-scientist. In consonance with the climatic parameters inclusive of rainfall, temperature, humidity, etc., agricultural systems & sub-systems have taken shape. The basic principles of natural evolution have created the appropriateness of different agricultural sub-sectors to varying climatic conditions. This could be water guzzling paddy which may be more suited to semi-temperate climates and millets in arid and sub-arid tropics; or temple horticulture on the upper reaches of the Himalayas and dryland horticulture in the sub-tropics; or buffalo based dairying in hot and humid climates of the

Deccan Plateau and Sahiwal cow in North India; and so on their forth. Similar patterns would be visible across the continents.

Further, in accordance with the principles of survival of the fittest, the agricultural fauna and flora have also adapted themselves to the geographical situations. Thus has evolved the stable agricultural system of today catering to mankind's basic requirements of food, fodder, industrial raw material etc. It would be more appropriate to say that the agriculture system ever since it originated about 10,000 years ago and transitioned man from hunting to settled stage sowed the seeds of the first civilization. Since then there at best have been only marginal or insignificant changes "in principles" season-bound to the 'in principles' season-bound agricultural practices. The mankind including in India has adopted and shaped his civilization around agriculture.

Agriculture has defined the contours of India's civilization and culture and nurtured the same through centuries. Agriculture has served as the anchor of the majority of India's population dependent as they are on farming for their livelihood. Any basic change in the stability of the agricultural system is bound to impact the farming community in several ways.

With climate change implications resulting in shift in seasons and cropping systems, the life of a farmer, relating to both his profession and cultural life, can be expected to face an unsettled environment. The changes are likely to be substantive, impinging upon the farmers directly, calling upon the need for major re-adjustments. The agricultural practices, which are a natural habit formed not just within a farmer's lifetime but over generations, transferred like inherited traits would be hard to change. The demand for change would be at both mental and operational levels. A farmer's ability to adjust himself to the new environment would be challenged. There would be demand for appropriate skills and resilience. At the simplest level, the farmer would now be required to change the cropping pattern because of shift in season and consequential and new response system in respect of seeds, farm practices, farming equipments & machinery etc. In short, the new challenges would amount to "change management".

The Change Management would involve a certain period of transition from the existing to the new system and it is during this period of transition that the challenges of moving smoothly to a new situation will have to be dealt with by the farmers. The ability of the farmers to manage this fundamental change will depend upon his level of information, knowledge, skill, attitude and above all financial strength. Considering that more 86 per cent of the agricultural households are small and marginal, the fiscal space available to them to cater to the change demands is severely restricted. The levels of literacy and general awareness are also a concern.

Obviously the change management under such circumstances is going to be difficult and would require the Government to provide them both support and counsel. It would, therefore, be necessary that a comprehensive plan and a time bound roadmap are designed and adopted by all government agencies to guide and handhold the farmers through this difficult process of change. The small & marginal farmers, as also the landless agricultural labour would require special attention. This would mean adoption of a package of mitigation and adaptation measures for guiding climate change induced impact on agriculture and farmers.

In this regard, the National Action Plan on Climate Change (NAPCC) comprising, inter alia, eight National Missions in specific areas of Solar Energy, Enhanced Energy Efficiency, Sustainable Habitat, Water, Sustaining the Himalayan Eco-system, Green India, Sustainable Agriculture and Strategic knowledge for Climate Change was released in June 2008.

4. Farmers' Welfare

Understanding Welfare

The term 'welfare' has a long history and has been a subject of discussions across various disciplines including economics, sociology, political economy, psychology, etc.

The Oxford dictionary defines welfare as:

- i. The health, happiness, and fortunes of a person or group.
- ii. (a) Statutory procedure or social effort designed to promote the basic physical and material well-being of people in need. (b) North American: Financial support given to those who are unemployed or otherwise in need.

The Merriam Webster dictionary defines welfare as:

- i. the state of doing well especially in respect to good fortune, happiness, well-being, or prosperity
- ii. (a) aid in the form of money or necessities for those in need; (b) an agency or program through which such aid is distributed

Welfare in terminology can be defined as a minimal level of well-being and provision of social services and support for citizens and other eligible residents who do not possess sufficient current means to satisfy their basic needs. In most developed countries, welfare is mainly provided by the government from tax revenues, and to a lesser extent by NGOs, charities, informal social groups, religious groups, and inter-governmental organisations.

Development also contributes to the welfare of people. For example the building of rural road networks or electrification leads to an improved status of well-being and brings greater opportunities for the region to fare well in their living. In such a case, the development empowers the people to progress and live better.

Ministry of Agriculture & Farmers' Welfare: The erstwhile Ministry of Agriculture was renamed by the government, appending the phrase "Farmers' Welfare". The term 'welfare' used here, is translated from the phrase Kalyaan. This is not merely a name change, but indicates the government's agenda to add focus on farmers, and not on agriculture as a sector alone. In any enterprise or organisation, the human resource is more important than all other resources. In agriculture, farmer is the human resource.

How the notion of kalyaan is interpreted by development agencies, is important to how they drive the associated programmes. Would it be appropriate to link kalyaan only to social services? Or is this more about economic welfare, associated with long term well-being, to be achieved by empowering farmers with the right knowledge, tools and facilitation. Has the concept of kalyaan been lost in translation? It is important to understand 'welfare' from the

perspective of empowerment and not limit the interpretation in relation to gratuitous patronage or daan. Farmers too have repeatedly expressed they seek opportunity to progress in economic terms, and not a dependence in perpetuity. This is also evidenced in recent demands by farmers to find optimal value at markets, and support in optimising their business opportunity.

Indicators / measures of farmers' welfare

In the light of the above discussions, a farmer's welfare can be defined / calculated in terms of:

- both absolute and relative average income;
- availability and accessibility to social security system – education, health, etc.;
- facilitating the farmer in moving up Maslow's need hierarchy beyond social security.

Some of the measures suggested are:

- average monthly income and consumption expenditure and the resultant saving / surplus;
- income spread amongst agricultural households belonging to different size classes of land holding;
- comparative monthly income of agricultural households vis-à-vis other professional classes;
- relative monthly income of agricultural households vis-à-vis the national average of the whole population;
- percentage of farmers below poverty line.

Some additional measures of welfare suggested for adoption are:

- average size of indebtedness and access to institutional credit;
- average amount of investments in creating productive assets;
- average rate of literacy; and
- state of health of the family [life expectancy at birth, Infant Mortality Rate (IMR), Material Mortality Rate (MMR)]

Measuring farmers' income and farmers' welfare – standardised methodology and interval:

As of now, there is no fixed interval estimates of farmers' income. In the absence of a standardised approach, reliance for evaluating the state of farmers' income is sample survey

based estimates of NSSO (2002-03 and 2012-13 agricultural years); and estimates by researchers. These are not only not enough, but also do not meet the requirement of monitoring the change in farmers' income in the light of the vision of doubling farmers' income by 2022. It is, therefore, suggested that:

- A comprehensive parametric based scale be developed to measure farmers' income and welfare (economic and social parameters be incorporated).
- The interval of measure should be annual, based on a sample survey; and five yearly, based on universal survey.

5. Planning and Review – Institutional Arrangement

As per constitutional arrangements, agriculture is a state subject. Hence, both production and marketing are primarily viewed as the responsibilities of a state machinery. The world has always recognised the importance of a vast market. Hence the globalisation the world experiences. India as a nation with its enviable geographical expanse, facilitative agro-climatic basket and elephantine consumer base should not fail to recognise the advantage of pan-India production and marketing design. After all, there always is an inter-play of several vectors across the states, as also across the nations influencing overall growth and development.

This entails a continuum of planning, implementation, review and monitoring between the Gram Panchayat and Krishi Bhawan, via the District and State headquarters. This is however not to suggest, that agriculture should be moved out from the state jurisdiction. It is only to emphasise that dismantling of state-bound mind-set in production planning and boundaries in marketing would help the farmers take a more rational decision vis-à-vis both production plans and market access. Against this understanding, following institutional systems are suggested – one led by the political leadership, another by the bureaucratic executive and the third as a domain authority.

- i. Three-tier system for planning, reviewing and monitoring.
- ii. Four-tier arrangement for convergence of resources, coordination of efforts and synergy of execution.
- iii. Omnibus agricultural regulatory authority for dispute resolution of all issues.

Three – tier system

The Department of Agriculture, Cooperation and Farmers' Welfare (DAC&FW) has already advised the state governments vide its letter, dated, 22.3.2017 to put in place the following systems at state and district levels and has issued Guidelines to this effect. The main objectives to be achieved by these Committees are as follows:

- i. Focus on increasing the net income from each unit of farm by reducing the cost of cultivation / production, increasing per unit yield and higher market return on the farmers' produce.
- ii. Make efforts to offer security to farmers against unpredictable nature of agriculture through comprehensive crop insurance, unified insurance package (UIP), speedy & efficient delivery of relief entitlements and the like.
- iii. Enhance access to institutional credit, both by increasing the volume of credit and also by better targeting.
- iv. Supplement the farmers' income, particularly during off-season times by creating an enabling environment for generating alternate off- farm activities.

- v. Build farmers' resilience and prepare them to negotiate unpredictable nature of farm activities and low level of income by coverage under various welfare schemes of the Government.
- vi. Check every probability of farmer-suicide by working to remove indigence and vulnerability among the farming community.
- vii. Improve Governance with a view to achieving efficiency and transparency in delivery of agricultural services.

Four-tier arrangement for effective implementation

Following and in harmony with the decisions of the three-tier institutional mechanism as discussed in the preceding section, a robust system for ensuring effective coordination in implementation is necessary at all appropriate levels. The following system is suggested:

National level: Agricultural Development and Farmers Welfare Group

The system of domain-dedicated "Group of Secretaries (GoS)" introduced over the last 3 years has proved to be very effective in breaking thought barriers and mainstreaming annual strategic interventions.

Agricultural Dispute Resolution Authority

The government may consider an authority for agricultural dispute resolution. This proposed Authority would serve as a fast track redressal mechanism for matters such as disagreements relating to crop insurance, land leasing, contract farming, and other implementation issues. This will offer an alternative to disputes in various areas that effect the farmers' economic activities. The Authority could be omnibus and quasi-judicial, and hence do away with the need for individual authorities for agricultural matters like contract farming, land lease, etc.

6. Grassroots Level Participation

As Strong as the Weakest

As put concisely by Leibig in his “Law of the Minimum”, the strength of a chain is the strength of its weakest link. It holds good in governance, administration and management relating to agriculture sector too. Take the case of average yields across various crops and sectors in India. The high global ranking of India in terms of volumes of production is more a function of area or number (e.g. of bovines). However in terms of productivity, there is so much to catch up.

The average gap between the FLD (farm level demonstration) and farmer field level yields varies from 28 to 63 per cent depending upon the crop. If one measures the farm yield against the research plot claim, the scene only worsens. This illustrates, that notwithstanding the high yield potential of a variety at the research station, most of it does not manifest at the farmer’s field level on account of several reasons, and therefore in this case, it is the farm and farmer who constitute the weakest link. In the final analysis, the strength / potential of the ‘variety’ is equivalent to that of the farm and farmer.

The delivery pipeline should therefore focus on identifying various constraints and challenges, which if surmounted will enhance the capacity of the weakest link and improve the efficiency of the delivery system. The challenge as identified and elaborated in the preceding volumes can be categorised under: technology, manpower, material, finance, knowledge and human resource. The most sensitive and critical of all these is the ‘end-user’ the farmer. Hence, intense involvement of the farmer in the process of decision making and implementation can enhance the capacity of the weakest link.

In the opinion of the DFI Committee, the farmer also needs to be reoriented and capacitated in respect of the following:

- Awareness, knowledge and skill
- Openness to new ideas and technology
- Perception of agriculture as an enterprise – transition from subsistence (production dominant) to commercial (market-centric) practice
- Willingness to join interest groups like FPO, value chain platform, FLG, cluster etc.

Co-opting the Farmers

It is a common complaint of the farming community, that they are not adequately represented in making decisions that concern their interests. At the macro-level, it is presumed that the elected representatives of the people (of whom farmers are a dominant sub-section) represent the farmers' interests. There is no denying, that they do, as is manifested in several legislations at parliamentary and state assembly levels.

Thanks to 73rd Constitutional Amendment, the decentralised democracy has taken decision making process closer to the farmers through the system of Panchayat Raj Institutions (PRIs). In fact, these PRIs at the district (Zilla Parishad), taluk / block (Taluk / Panchayat Samiti) and village (Gram Panchayat) levels are closely and intensely engaged in agriculture related decision making, more specifically with reference to implementation.

There are also state / national level Boards, Cooperatives and Corporations, that have places reserved for those representing interests of the farmers.

Then there are Gram Sabhas, Watershed Committees, Forest Management Committees, Milk Societies, PACSs (Primary Agriculture Cooperative Societies), APMCs (Agricultural Produce Marketing Committees), WAUs (Water User Associations) and the like which are further decentralised institutions, that operate right at the cutting edge operation & maintenance. There are innumerable other non-formal or more correctly voluntary-in-nature based grass-root level bodies. Some such examples are SHGs (Self Help Groups), JLGs (Joint Liability Groups), Commodity Interest Groups (CIGs), FPOs (Farmer Producer Organisations – both cooperatives and companies), etc.

Not to forget are the pressure groups of farmers. These are mostly the farmers associations with varying degree of ability to influence decision making at government level, besides creating an opinion in the society.

Despite these plethoras of formal and informal institutions, organisations and platforms, a large majority of the farmers feel that they are not well represented in decision making and that their interests are not well protected. The challenge therefore lies in evolving systems that will facilitate wider and more genuine participation from all type of farmers.

Gram Panchayats as delivery institutions

Gram Panchayats (GPs) are the lowest level, decentralised and integrated developmental institutions headed by peoples' representatives, and supported by field level bureaucracy. Hence, they constitute the most appropriate centres for dovetailing developmental and welfare programmes. Since the 73rd Constitutional Amendment, these centres are getting consolidated, capable of shouldering multifarious responsibilities. Rural development activities, including wage employment initiatives under MGNREGA are channelled through

GPs. Agriculture sector is the basic and most expansive development intervention that relates to the majority of the rural society.

It is, therefore, both appropriate and important to make GPs responsible for agricultural development encompassing planning and execution. The village level action plan should be prepared at GP level and integrated into Block Action Plan (BAP).

Gram Panchayats as Centres of welfare

Farmers' welfare deserves special emphasis. In relation to this, the care of both land owning / cultivating farmers and landless agricultural workers should become the mandate of Gram Panchayats (GPs).

Direct participation of farmers

With increasing awareness and negotiation skills, the farmers, and the youth in particular are eager to participate in the decision making process. Gram Sabhas provide a good platform for intense deliberations and decentralised decision making.

Deeper penetration of IT network and mobile usage (both smart & basic), make it possible for virtual interaction. With deployment of portals, IVRs, skype and video-conferencing facilities, the intensity of farmers' participation can be deepened. It is important to take advantage of technology, that bears the capacity to neutralise hierarchy, break down barriers, jump decision making stages and create a friendlier & hassle free and flat & horizontal partnership.

7. Investment Pattern in Irrigated and Rainfed States

Investment is important for holistic growth and development of any economic activity. In agriculture too, it is key to sustained output growth. There has been a significant increase in investment in Indian agriculture (when both public and private investments are considered together) in the post-reform period, compared to that in the pre-reform period. In the 1990s, the time when Indian economy embarked upon the phase of liberalisation, the growth of public investments was however not very encouraging. There was subsequently a change in the trend in the 2000s. Since 2003, the government has been injecting funds into the agricultural sector at an accelerated rate, which to an extent defies the notion of 'neglect of agriculture' built up during the 1990s (Bathla, 2014).

Investment at state level assumes importance in the context of weaving a policy, that promotes policy balanced regional development. India is home to diverse agro-ecological systems. However, agriculture in the country is still largely rainfed and vulnerable to vagaries of monsoon. But few regions/states in the country like Punjab, Haryana and western Uttar Pradesh, as also other states with large river systems have been able to bring a large proportion of their cropped area under assured irrigation, and these for the purpose of analysis have been grouped under Irrigated States and other categories are defined by the status of irrigation available for agriculture

An Examination of Capital Investments

Public investment

The nature and magnitude of public investments in agriculture are generally explained by the priority of the government towards the sector. The public sector investment is key to creation of irrigation, roads and power infrastructure. The share of public GCFA (gross capital formation in agriculture) has always been lower than that of private GCFA, at nearly one-fourth of the total investment in agriculture.

Private investment

The private investment comprises investments by household sector as well as the corporate sector. So far, the major share of investment is accounted for by the household sector and the score in case of corporate sector as a percentage of private sector investments is as low as 2-3. While public sector investment has been a primary contributor to capital formation in agriculture through creating irrigation, roads and power infrastructure, the role of private sector is important too and its role is gaining recognition in moving the agriculture to next stage of development.

8. India - Subsidies in Agriculture

Subsidies are amongst the most powerful instruments for influencing or balancing the growth rate of production and trade in various sectors and regions. Subsidies also play an important role in correcting the existing inequalities in the society, when used to protect interests of the weaker sections. In India, agriculture is of prime importance since around half of the labour force is still engaged in this sector. Despite several measures since independence, average rural incomes are still far behind average urban incomes. The input support through subsidy in fertilizer, credit, electricity and output support via MSP based procurement operations constitute some important interventions. These subsidies have been consistently deployed by the government to protect the interests of farmers.

During the last three decades in particular, subsidies provided by Government of India have shot up substantively from Rs 12,158 crore in the year 1990-91 to Rs 2,43,811 crore in 2015-16. The percentage share of fertilizer subsidies in the total basket of subsidies increased from 36.41 in 1990-91 to 51.4 in 2000-01, and declined thereafter to the level of 29.9 in 2015-16. This decline in percentage could be on account of bringing phosphorous (P) and potassium (K) under NBS (Nutrient Based Subsidy), and higher procurement cost arising from substantive increase in MSP for various notified crops including wheat, paddy & pulses. Further, with adoption of National Food Security Act, PDS (Public Distribution System) has become more universal entailing higher quantum of food subsidy.

The ratio of poverty is higher in rural areas, where agriculture continues to be the dominant economic activity, notwithstanding some structural changes in the rural economy over the last about a decade.

India is among one of the largest producers and consumers of fertilizers in the world. Initially fertilizer subsidy was introduced to ensure its availability to farmers at an affordable price, and enable adequate returns on investments.

Food subsidies in India

The subsidy obligations of Government of India on account of foodgrains have increased significantly over the last two decades from Rs. 6,066 crore in 1996-97 to about Rs. 1,22,676 crore in 2014-15, an increase of over 20 times. Since 1996-97, food subsidy as a percentage of total subsidy grew from 39 per cent to 57 per cent in 2003-04, and thereafter declined to 47 per cent in 2014-15 (Table 12.9). The government's foodgrain policy is mainly carried out by the Food Corporation of India (FCI). It is the FCI or its selected state government agencies, who acquire paddy and wheat from farmers at the notified minimum support price (MSP). The Government of India utilizes the procured wheat and rice under Targeted Public Distribution System (TPDS) and other welfare schemes and for maintaining the buffer

stock of foodgrains so as to ensure food security. The quantum of wheat and rice meant for TPDS is issued to the states and union territories at a highly subsidized rate. The differential between the procured and issued price is met by the central government. While this is a huge financial obligation, it integrates the loop between procurement and disposal of the commodities. While the consumers benefit from subsidized food, the farmers benefit from assured market at MSP.

However, several studies have shown, that this system has benefited only a few states, and further the relatively larger farmers within these states, with higher marketable surplus ratios. It is also no gain saying, that it has benefited only 2 crops – wheat & paddy.

Centripetal influence on subsidies

The subsidy related experience over the last 50 years since the introduction of green revolution in the country shows, that there is a tendency of various subsidies to crowd around a certain point, influenced by centripetal force. Take the case of green revolution, that majorly banked on paddy and wheat for driving the food security vision of India. The crowding has happened in the following way:

- High Yielding Varieties (HYVs) were introduced for paddy and wheat.
- Both were irrigated crops, and HYVs needed intensive use of inputs like water & fertilizers for them to express phenotypically in-synch with their innate genetics potential.
- Each of these inputs – seed, fertilizer and water needed to be incentivized by offering price concession to increase their adoption.
- Further, adoption of the new package of technologies had to be incentivized by offering a minimum support price (MSP), so that pre-seasonal notifications served as a price signal to the farmers, and they could be influenced to grow paddy and wheat.
- Since the agricultural markets were not efficient enough to discover remunerative prices on the paddy and wheat output, they had to be offered price support in the form of procurements at MSP by the Food Corporation of India (FCI).

The above chain comprising several links came to be built on heavy subsidies at each stage. It turned out to be a typical case of acquiring a cat to keep off the rat, which then necessitated acquisition of a cow to produce milk for the cat reared at home and so on in an endless way.

New challenge from surpluses

The current times in the history of India's agriculture is faced by a challenge of another nature, which emanates from a situation of surpluses, and ironically disfavours the farmers from realising remunerative prices. This is however not an insurmountable problem. Several market reforms rolled out by the government, supplemented by the proposed broadbased procurement operations will come to benefit the farmers.

Over the years, government sponsored subsidies to farmers in terms of fertilizers, irrigation, electricity and procurement-subsidy system have witnessed an annual increase. Of the total planned revenue expenditure for agriculture, significant part is spent on subsidies leaving a very small amount earmarked for capital investment in agriculture. As a result, agriculture sector in India seems to be more dependent on input subsidies relative to other large emerging economies. The need is to prioritise capital investments over subsidies, reserving the latter to the truly needy among the farmers. Further, subsidy transfer can be efficiently targeted by adopting Aadhaar linked Direct Benefit Transfer (DBT). Savings achieved by this, should however be retained for agriculture sector and added to the yearly normal budgetary allocations for enhancing capital investments for basic infrastructure like irrigation, power, roads, communication, post-harvest agri-logistics, markets and the like.

What is further worth appreciation vis-à-vis the present situation of surpluses, is the window that is now available to make wholesome changes to the policy support including Agri-R&D and broadbase agricultural transformation, besides making it income-centric. Towards this directional change, the substantive size of subsidy that is annually offered can be restructured and apportioned for right investments and for the targeted farmers, who need support of subsidy.

9. Inflation Management

Food Inflation

Food inflation trends in India over the past few decades show that diverse commodities have been the reason for food inflation in different years, and that no specific commodity can be held accountable for high inflation. Studies show that eggs, milk, meat, fish, vegetables and cereals were the main influencers vis-a-vis the most recent food inflation.

Vegetables and fruits revealed a much higher degree of intra-year volatility; high-weight commodities in the national consumption basket also showed very high inflation rates; and the contribution of pulses and edible oils remained low in terms of inflation. Shekhar et. al. (2016) established that both supply and demand factors are the reasons for inflation.

Prices of commodities such as cereals and edible oils seem to be driven by supply-side factors such as wage rates, level of production and minimum support prices, whereas in case of pulses, the effects of both supply- and demand-side factors appear almost equal. The prices of eggs, meat, fish, milk, and fruits and vegetables appear to be driven mainly by demand-side factors.

Several studies like those of Anand et al. (2016), Meenakshi (2016) and Shekhar et. al. (2016) have also highlighted the importance of these factors in shaping India's inflation dynamics and determining the conduct of monetary policy. Sonna et al (2014) provides substantial evidence on the importance of demand forces. The study shows that rising real rural incomes have had the major impact on food inflation while cost-push factors have a relatively smaller impact. Gokarn, S. (2012), in his comprehensive analysis of India's key food price issues for more than fifty years summarises, that rise in food prices is because of stagnation in food supply and food inflation cannot be contained until and unless food supply is regularised.

The Other Side of Food Inflation: Input Cost

In the recent past, there has been a significant increase in agricultural cost of production. To analyse the extent to which increase in cost of production in agriculture has contributed to food price inflation, agricultural input price indices have been used, which consisted of major farm inputs like fertilisers, pesticides, electricity, high speed diesel, light speed diesel oil, fodder, cattle feed, tractor, agricultural machinery & implements and lubricants. Within the category of agricultural inputs, light diesel oil recorded the highest inflation, followed by high-speed diesel and lubricants. Another traditional explanation for rising food prices has been the input supply-side shocks related to climatic conditions, either because of droughts or floods. Often, it is observed that the sudden slump in food supply associated with climatic conditions has led to food price inflation. (RBI, 2014).

Balancing Food Inflation and Guarding Farmers' Interest

The rising food inflation has been regulated by adopting different measures over the years. Some of these include subsidies on food and fertilisers, imports of food, and prevention of hoarding of farm produce. Though they did succeed in stabilising prices, such crisis management practices have been able to provide only short-lived respite, failing to check a continuous upward trend of food prices since 2007.

Over-emphasis on containing food inflation is good for the consumers, but bad for the farmer-producers. By causing stagnation in prices of food items, food production is rendered unattractive to the farmers. This approach will make food prices less remunerative; and discourage investments in agriculture, putting further stress on supply-side in the long run triggering inflationary pressure as a sequel. An effective strategy to keep food inflation at optimal level, while also benefiting the farmers from higher returns consists of enhancing per ha. yield (through more efficient production system) and an efficient agricultural marketing system (through market integration and a robust agri-logistics), that will ensure a higher share of the farmer in the consumers' rupee. Merely increasing the prices in the market may not ensure better returns to farmers, as it may benefit only the intermediaries. From the farmers' income perspective, higher prices in the market constitute only a necessary condition, but not a sufficient condition. Capturing a higher share of the final value is therefore of more relevance.

Several other steps are needed to increase farmers' share in the consumer's price. The need is to lower the transaction costs. The farmer pays for transportation over long distances for his produce, before actually knowing the value at which his produce would be sold. The journey from farm gate to final consumer involves multiple levels of conveyance, labour expenses, commissions of agents and a market fee & cess, roughly adding to nearly one-fifth cost to food prices. There is need for large outlays to set up climate-controlled infrastructure to enhance the shelf life of farm produce. The public private partnership (PPP) could play a significant role in boosting the investment and adding value to the infrastructure. There is also need to add value to farm produce by facilitating food processing on a much larger scale, as food-processing industries can enhance both shelf life and add value to the products. However, some regulations like the Essential Commodities Act (ECA), which imposes strict restrictions on stock limits and curbs movements, creates uncertainty, dis-incentivising long-term investments. This calls for reforms and liberalisation, and assume importance in the overall strategy for doubling enhancing farmers income.

10. Mobilising Farmers

Cooperatives are present in most of the countries and in almost all the sectors, including agriculture, food, finance, health care, marketing, insurance & credit. A cooperative is an autonomous association of persons, united voluntarily to meet their common economic, social and cultural needs and aspirations through a jointly owned and democratically controlled enterprise.

Cooperatives have inherent advantages, for addressing issues of poverty alleviation, food security and employment generation, considered to have immense potential to deliver goods and services in areas where both the public and private sectors have failed. Since its formal launch in 1904 in India, the Indian Cooperative Movement has played very important role in the Indian economy, especially in the development of the agriculture and rural domains combining the strengths of both public and private sectors. In particular, the small and marginal farmers and weaker sections have benefited from cooperatives.

Agriculture sector, which still employs 48 per cent of the total workforce in India and contributes around 15.5 percent to the country's GDP (2016-17), needs sturdy cooperatives so as to overcome many of the difficulties faced by the farmers, especially in the context that 86 per cent of the farmers belong to small and marginal category. Farmers in India usually buy their inputs at retail price and sell their produce at wholesale prices, thus loosing at both stages. Organisations built on the concept of collectives (cooperatives and FPOs), could play key role in numerous areas like input purchase farm advisory, value addition and branding, storage facilities, soil-water-seed testing, purchase or hiring of customize farm machinery sale of output.

Need for Cooperatives in Agriculture

Lack of sufficient numbers significantly reduces the bargaining power of small and marginal farmers both in case of input procurement as well as sale of produce. Small and marginal farmers require agricultural inputs in small quantities, which they procure from local traders at a considerably higher price than the wholesale rate. Most of the times, inferior quality of these inputs further aggravates the problem. Often for small and marginal farmers transporting small quantities of produce to urban markets is not a feasible option, and they end up selling their produce (most often perishable produces) to local traders at lower prices than normal. Lack of techniques for access to credit and insurance services and vulnerability to several forms of risks (climate change, pests and other risks) complicate the scenario for small and marginal farmers in India. Several of these concerns have given rise to the notion of a cooperative so as to ensure low costs of inputs, opportunities for value-addition and processing, collectively increasing the numbers so as to enhance bargaining

power in case of marketing, (Agarwal, 2010), and access to formal credit (Braverman et al., 1991).

Successful Cooperatives in India

In the first few decades after independence, the sector played a pivotal role in the economy, especially in respect of primary sector production. Maharashtra, for example, has been home to some successful cooperative movements in agriculture, with the strong emergence of sugarcane farming and sugar production cooperatives, as well as in consolidation of cooperative credit banking system. The dairy cooperative is another success story in India. The Anand model for cooperative milk marketing in Gujarat launched in the year 1946, with its well-recognized Amul brand, provided later the blueprint for replicating its success elsewhere under the National Dairy Development Board program, contributing to the success of Operation Flood.

In case of fertilizer production and distribution, the Indian Farmers Fertilizer Cooperative (IFFCO) controls over 35 per cent of the market. In the production of sugar, the cooperative share of the market is 58 per cent, while in the marketing and distribution of cotton it is 60 per cent. Cooperative sector accounts for 55 per cent of the production in the hand-woven textiles sector, whereas cooperative marketing and distribution channels account for 50 per cent of the edible oil market in India. Dairy cooperatives in India, operating under the leadership of the National Dairy Development Board (NDDB), collectively, are the largest producers of milk in the world.

Notwithstanding the significant gains made by the cooperative movement, the sector has of late shown signs of slowing down with several issues emerging. Unfortunately, the notable successes have remained limited to some apex groups, while most of grass-root cooperatives continue to remain fragile and continue to depend on outside agencies for their survival.

Linking Cooperatives with Farmer Producer Organisations (FPOs)

Cooperatives being traditional in structure, lack linkages with buyers, input suppliers, etc., who are vital actors across the larger supply chain. This undermines long term sustainability of cooperatives. Thus came a new form of collectives called Farmer Producer Organisations (FPOs) to address the challenges faced by the small and marginal farmers, particularly those to do with enhanced access to investments, technological advancements, and efficient inputs and markets (Hellin et al., 2009). These collective efforts, evidently offer means for small and marginal farmers to contribute in the otherwise imperfect markets of the developing countries (De Janvry et al., 1991).

The basic purpose envisioned for the FPOs is to collectivise the small farmers for backward linkage for inputs like seeds, fertilizers, credit, insurance, knowledge and extension services;

and forward linkages such as collective marketing, processing, and market-led agriculture production (Mondal, 2010). While cooperatives entail benefits to farmers via state intervention, FPOs are perceived to empower farmers through collective bargaining along with imparting an entrepreneurial quality to farming, which otherwise is practised as a subsistence, particularly by the small and marginal farmers.

Heralded as contributors to livelihood enhancement through provision of substantial gains beyond what is possible within the traditional farming context, FPOs that function as farmer producer companies, can leverage on the strengths of cooperatives to engage with the government on reforms in agriculture.

Government of India has initiated several measures towards this. The Small Farmers Agribusiness Consortium (SFAC) mandated by Department of Agriculture, Cooperation and Farmers Welfare, Ministry of Agriculture and Farmers Welfare, Govt. of India, supports the state governments in the formation of Farmer Producer Organisations (FPOs). Besides providing initial grant, it also provides venture capital assistance.
