

New Dimensions Of Development In Agriculture

- Agricultural sector plays a significant role in any economy.
- About 70 per cent of our country's population is directly engaged in agriculture and allied sectors.
- On the contrary, the proportion of agricultural sector is **very low in the economy of development** countries. On an average, it is 5 percent in the UK, 4 percent in the US, 14 per cent in France, 16 percent in Australia, 21 percent in Japan and 32 percent in Russia.
- The high proportion of agriculture sector in Indian economy is due to the fact that **non-agricultural sector has not been adequately developed** in proportion to the requirement of rapidly growing population.
- According to the Central Statistics Office, the contribution of agriculture and allied sectors in national income during the year 1960-61 was 52 percent.
- In **2001-2002**, the *share of agricultural sector in national income was 32.4 percent.*

Steps Taken In This Sector**A. Agriculture**

- **Two corpus funds** have been constituted for the period from 2017 to 2020. These are '**Micro Irrigation Fund**' and '**Dairy Processing and Infrastructure Fund**'.
- In 2018-19 Budget, Rs. 2000 crore have been earmarked for '**Agricultural Market Infrastructure Development Fund**', Rs. 7550 crore for '**Fisheries and Aquatic Science Infrastructure Development Fund**' and Rs. 2450 crore for '**Animal Husbandary Infrastructure Development Fund**'.
- The **Minimum Support Price** has been announced for different agricultural commodities from the Kharif season of 2018-19, which is **one and a half times** of the cost price or more.
- In addition to promoting pro-farmer initiatives, Government has approved a new umbrella scheme '**Pradhan Mantri Annadata Aay Sanrakshan Abhiyan**' (PM-AASHA).
- The objective of this scheme is to provide **the peasants reasonable price for their produce.**
- To improve the economic condition of the farmers, the target of **doubling their earnings by 2022** has been set.
- To materialize this vision by the year 2022, special attention is being given on increasing *productivity, reduction in cost of farming and strengthening the post-harvest management and market structure.*
- Various market reform-oriented measures have been implemented, such as the **Model Agricultural Produce and Livestock Marketing Act, 2017** and **Model Contract Farming and Services Act, 2018.**
- "**Pradhan Mantri Fasal Bima Yojana**" has been launched from the Kharif season of 2016 to provide safety-shield to farmers against the losses to crops, due to natural calamities.
- The maximum premium for **Kharif crops** has been fixed at **2 percent** and **one and a half percent for Rabi crops.** Along with the standing crops, the risks involved before sowing and after harvest, are also included in it.
- With the aim to bring transparency and improvement in the agricultural marketing sector, "e-NAM" platform was introduced in April 2016.

- **Organic farming** is being focused and promoted under '**Paramparagat Krishi Vikas Yojana**'.
- More investment has been made to **strengthen cooperatives**.
- The emphasis is also on **Integrated Farming System**. Under this, special attention is given to *multi-cropping system, cyclical farming and allied activities* such as horticulture, livestock, fishery and bee-keeping.
- Under this system, the emphasis is laid on *minimum ploughing, use of crop-residue on soil surface and adoption of crop rotation*. These measures have **reduced the damage** to the **fertile soil** to the minimum level.
- The Government has implemented the **world's largest Soil Health Card scheme** to provide feedback to the farmers on the fertility of their agricultural land, on the basis of **testing 12 parameters of soil-samples**.
- On account of **neem-coated urea** being promoted, the use of urea has, itself got controlled.
- Its **availability has increased** for use in the crops and the **cost of fertilizers has decreased**. The entire quantity of the domestic and imported urea has become Neem-coated.
- Today, India has become self-reliant in the **production of pulses**. In order to meet the requirement of edible oils in the country and enhance the production of oilseeds, activities of **National Mission on Oilseeds and Oil Palm** are underway.
- A new central scheme called "**Agricultural Mechanization Promotion**" has been launched with the aim of decreasing the cost of farming, increasing the crop-yield and management of crop-residues.
- It is being implemented in Punjab, Haryana, Uttar Pradesh and National Capital Region of Delhi. The focus of this scheme is on in-place management of crop residues.
- Farmers are being provided *50 percent of the cost of machinery/equipment as financial assistance* for the purchase of machinery on personal basis for management of crop-residues.

B. Livestock & Fisheries:

- At present, the number of livestock in India is around 30 crore, which is **18 percent of the livestock in the world**.
- For the conservation and promotion of native breeds in 28 states, **Rashtriya Gokul Mission** has been launched.
- For the first time in the country, 2 **National Kamdhenu Breeding Centres** are being set up for the overall development of indigenous livestock breeds and conservation and upgradation of native breeds.
- Under the National Productivity Mission, the work of **providing Nakul Swasthya Patra** to 9 Million milch cattle is in progress.
- In order to *link breeders of native bovine breeds and farmers*, '**e-Pashudhan haat portal**' has been set up.
- Today, India is at the **first place in milk production** and contributes 19 percent of world's total milk production.
- The availability of **per capita milk** has also increased significantly in our country. Similarly, as compared to the period from the year 2010 to 2014, **the income of dairy-farmers has increased by more than 30 percent** during the period from 2014 to 2018.

- ‘**Blue Revolution**’ has been announced in the fisheries sector. Through Blue Revolution, the resolution to make India the *world’s leading nation in the field of fishery development* is being focused upon.
- Under the Blue Revolution, a new scheme called “**Deep-Sea-Fishing**” has also been initiated. Under this, efforts will be made to increase the **fish production by 2019-20 to the level of 15 million tones**.
- The fish production was 126.14 million tones, during the year 2017-18, which is 42.22 percent more than the average annual production of 88.69 million tones during the year 2010-2014.

C. Research and Innovation

- Due to consistent research in agriculture, **795 new varieties of crops** have been released for farmers. These varieties of crops have the ability to withstand the effects of climate change.
- Innovative technologies developed by the **Indian Council of Agricultural Research (ICAR)** have made significant contribution in increasing the production of food-grains, horticulture-products, crops, milk, fish and eggs.
- Under the **Entrepreneurship Development Program, Krishi Vigyan Kendras** are helping farmers on various issues related to agriculture through training and technological resources.
- For better coordination among agricultural scientist and farmers, programs such as ‘**Farmer First, Mera Gaon, Mera Gaurav**’, and **ARYA**’ have been started.
- **ARYA (Attracting and Retaining Youth in Agriculture) scheme** has proved to be very effective in making the farming an attractive occupation for educated rural youth. “Rural Entrepreneurship Awareness” scheme has also been launched for the students.
- During the year 2017-18, there has been a record production of **284.83 million tones** of **horticulture produce**.

Conclusion:

- Government has made tremendous efforts to improve the economic condition of the farmers and to make farming a profitable occupation.
- It is fully committed to make the farming an attractive occupation like other major vocations, so that even the highly-educated youth could be motivated/could get attracted to adopt it as their main source of livelihood.

New Procurement Policy for Enhancing Farmer’s Income

- The **commission for Agricultural Coasts and Prices** announces the minimum support prices of **two dozen of crops**, prior to their sowing, but **only four are being procured** by the Government, at those announced prices.
- **Wheat and paddy** are procured by **Food Corporation of India** along with the State Agencies to maintain the buffer food stocks at the central level.
- The **cotton** is procured by Cotton Corporation of India and **Sugarcane** by Sugar Mills of the State.

Food Production: Statistics

- The total production of food grains that was only 82.02 million tones in 1960-60 thrived to 271.96 million tones in 2016-17 that includes 163.29 million tones of Paddy and 96.64 million tones of wheat.

- By 1970, the country that was heavily dependent on food imports. At present, it is the **top exporter of paddy**.
- In 2015-16, it exported 10.50 million tones of paddy and surpassed much ahead to the other rice exporting countries like Thailand, Vietnam, Pakistan, U.S.A. and Myanmar.

Why This Boom In Production Of Rice And Paddy?

- The escalation of area under wheat and paddy was **mainly because of assured marketing** as it was available to these two crops, whereas the area under other crops kept on depleting.
- India is the largest producer, largest consumer and largest importer of pulses. As the states where the assured marketing was provided to wheat and paddy, the area under pulses remained stagnant and the Import bills for pulses went on rising.
- It vindicated the fact that **assured marketing is much more important** than the allurements of higher but volatile and uncertain prices.

Role of MSP

- Pulses and oilseeds are the high valued crops those could be helpful to enhance the income of the farmers, the area under pulses had increased marginally.
- Since the inception of the minimum support price policy in Agriculture, when the minimum support price (MSP) of both the pulses and oilseeds were enhanced significantly, the area and output must have increased accordingly.

New Procurement Policy:

- Under the new Procurement Policy, the government has envisaged the **three alternatives**.
- **In first**, the *additional crops would be procured by the central government with partnership of the concerned State Government*.
- In **second case**, the *seller of those crops would be paid the balance of M.S.P. and the market price by the government, but the farmers would have to register themselves with the regulated market of the area*.
- In the **third option**, the *private traders can procure those products but those traders would have to pay the minimum support prices as announced by the Central Government*.
- Definitely it would have a very favourable impact. The area as well as output of those high value crops that includes the pulses and oil seeds in the country would escalate.
- Already, the country is producing enough food grains, and the rice is being exported. **The wheat prices in the International Markets are not attractive** that is why the export of wheat is not economical.
- But once the area under pulses, oilseeds and other high value crops would increase, it would reduce the import of those crops.

How Assured Marketing Will Bring The Change In This Sector?

- India is a country **of small farmers**, the large number of holdings belongs to marginal and small farmers below 2 hectares, those are 85.01 percent of the total holdings and holdings below 4 hectares are 95.05 percent of the total.
- Any agricultural policy must **address the problems** of this large number of farmers where assured marketing is a significant imperative. As these farmers are to eke out their living by their farm income, they cannot adopt the crops those are involving even an iota of risk.

- For diversion of their cropping pattern towards the high value crops, the assurance of the sale of their crops at the remunerative prices would be the most significant factors.
- There are certain other high value crops which are being used for medicines and for other necessities. The fruits and vegetables are also in the list of high value crops, but those are **affected by the big volatility in their prices**.
- Apart from minimizing the post-harvest losses, it is imperative to explore the Export potential, but assured marketing is the well tested gladiator to enhance the production of these products.

Way Forward:

- It had been observed that the daily use items like potatoes and onions had much volatility in their prices that is why their production had been affected.
- Now when the new policy of procurement is announced, **some of the high value crops of daily use including vegetables and fruits must be included** in the list of **state procurement** on the basis of the high yielding crops of that area.
- It has been observed that a **few agro-processing units** are operating for value addition of agricultural products but **availability of raw material is an issue**. Such impediments can be removed **by encouraging the contract farming** between agro-processing unit and the farmers with the prudent and suitable legal frame work in the state.
- The farm size is the most important factor of production, but area cannot be enhanced rather the size of the holding would further deplete by division of land among family members.
- The yield of the crop is already at its saturation point particularly those of the principal crops, because of the application of the law of diminishing marginal returns. But **yield of high value crops** can be enhanced being the new crops.
- We should keep in mind that the **cropping pattern may not get drifted towards the high value crops**, jeopardizing the food crops and food stocks of the country.
- As the new procurement policy would be adopted with the partnership of the states, so the **states must identify the various zones** even in the same states on the basis of the yield of the crop in the respective zone.

Institutional Credit for Agriculture

Agriculture sector (including agrarian activities) in India accounted for 14.8% of the GDP (at 2011-12 prices) in 2017-18, compared to 18.9% in 2004-05 and around 30% in 1990-91. Its role remains critical as it provides employment to around 50% of the workforce.

Investments in Agriculture

- In 2014-15, the private Gross Capital Formation in Agriculture accounted for 83% share, while that of public GCFA was 15%.

Role of Institutional Credit in Private GCFA

- Availability of timely and affordable credit facilitates the farmer to **gain access to quality inputs** and other support services. The strategy has, therefore, been to strengthen the role of institutional sources of credit to agriculture so as to replace informal sources of credit such as money lenders.
- As per AIDIS 2012-13, nearly 86% of the farm capital investments in India is undertaken with **institutional/non-institutional sources of funds**.

- At the all-India level, the share of such borrowing from institutional sources is estimated to be around 63%.
- However it is also an accepted fact that in most of the States of the country, the marginal and small farmers are more dependent on the informal sources for meeting their credit needs.
- The percentage of credit that is met from informal sources is 40.6%, 52.1% and 30.8%, for the landless, marginal and small farmers, respectively.

Flow of Institutional Credit for Agriculture

- India had adopted the multi-agency approach to purvey rural credit, since nationalization in the late 1960s.
- A large number of formal agencies like the Co-operative Banks, Commercial Banks and the Regional Rural Bank were actively involved in providing bank credit for agriculture and its allied activities.
- Even Non-Banking Financial Institutions [NBFCs], Micro Finance Institutions [MFIs] and Self Help Groups [SHGs] were also involved in purveying agricultural credit.

How The Different Agencies Contributed To Agricultural Credit Flow

- Amongst the agencies, RRBs exhibited the highest CAGR, while the Co-operative Banks reported CAGR of nearly 10%.
- On analyzing *inter-se* share, it is seen that Commercial Banks have consistently maintained a share of more than 70%, while the share of Co-operative Banks at 13% has witnessed a steady slide from as high as 40% during 1999-2000.
- The Share of RRBs is slowly inching upwards and stands at 12% during 2017-18.

Coverage of Small and Marginal Farmers

- The share of land holdings less than 2 ha. (SF/MF holdings) are on the increase : from 70% in 1970-71 to 85% in 2011-12.
- The number of marginal farm holdings (up to 1 ha). Which went up from around 3.56 crore to nearly 9.30 crore, now constituting two-thirds of the total agricultural land holdings.
- Providing timely and affordable credit to this resource-constrained group is the key to attaining inclusive growth.
- The good news is that the share of small and marginal farmers in loan accounts as well as credit flow have improved, of late. Small and Marginal Farmers accounted for about 75% of agricultural loan accounts and 50% of the agricultural credit flow in 2016-17, up 63% and 44% earlier.
- It means that there has been both widening (more people getting credit) and deepening (same people getting more credit) of institutional credit flow for agriculture, in recent years.

Way Forward

- The Kisan Credit Card [KCC] Scheme was envisaged to provide easy and hassle-free credit to the farmer. It has met with admirable success and with the launch of *RuPay* KCC became more cost-effective.
- Policy enablers in the form of interest subvention on crop loans and credit-linked capital subsidy schemes have also contributed in providing a fillip to agricultural financing by banks.

- Financing to Self Help Groups and Joint Liability Groups [JLGs] are attempts to leverage on group collateral to provide credit to rural poor women and small and marginal farmers.
- Cooperative farming, collective Organizations [FPOs], JLGs, leasing out land or contract farming are some possible ways of aggregation, both for input supplies to reduce costs as also for marketing to ensure better prices.
- Recent amendments to the Priority Sector guidelines by the RBI providing for specific sub-targets in flow of credit to SF/MF is also a welcome step.
- Financial products aimed at supporting more climate resilient and adaptive farming practices is the need of the hour.
- Credit flow for agro processing units, storage facilities, marketing infrastructure, etc., will facilitate in providing last-mile connect to enhance post-harvest value of agricultural produce.
- Simple insurance products that provides for hassle-free cover will also help improve resilience of the average Indian farmer and make agriculture a risk worth taking.
- A robust **Negotiable Warehouse Receipt** [NWR] system will enable farmers to monetize their produce early and avoid distress sale.
- The Union Budget 2018-19 also provides special focus for marketing of agricultural produce through electronically-linked *Gram in* agricultural markets.
- Higher investments in agricultural infrastructure from out of the dedicated Long Term Irrigation Fund [LTIF] and the Rural Infrastructure Development Fund [RIDF] will further boost credit flow to this sector.

New Initiatives in Research and Extension

- Research and extension are among the core activities identified for accelerating agricultural growth and prosperity of farmers.

Importance of investment in research and extension:

- National Academy of Agricultural Sciences observed, 'Investment in agricultural research in India has been a win-win option as it was the largest contributor to the agricultural total factor productivity, which in turn significantly contributed to reducing rural and urban poverty.
- During 1980-81 to 2006-07, the average internal rate of return to the investment in agricultural research was about 46 per cent.
- Science-led synergistic extension approach **led the agricultural sector towards white, blue, golden and pink revolutions.**
- Further, a strong extension support is also imperative to **disseminate emerging technologies** at grass root level for quick adoption and practice. The interface between research and technology transfer is indeed very critical outcomes.

Steps Taken:

A. New Varieties, New Hopes

- Studies indicated that by using **high-yielding varieties**, the yield increase in the range of 15-20 per cent depending upon the crop. It can be further be raised up to 45 per cent with efficient management of other inputs.

- ICAR developed and released a total of 795 new crop varieties during last four years and 136 varieties of horticultural crops.
- Wheat variety **HD CSW-18**, is the first variety specially bred for conservation agriculture. It will reduce water requirement and will help in residue management.
- Similarly, to boost up production of pulses, an extra-early (52-55 days) high-protein variety of **Mungbean, called Virat**, was released along with short duration (100 days) and iron rich variety of **Lentil (Pusa Ageti Masoor)**.
- Eight **GM Bt cotton** varieties were developed for the first time in India for commercial cultivation.
- Waging a war against malnutrition through agricultural research, an array of biofortified varieties of field crops and horticultural crops have been developed.
- For example, the rice variety **CR Dhan 310** is protein rich, whereas wheat **HPBW01** carries extraordinarily high iron and zinc content; among fruit crops pomegranate '**Solapur Lal**' has iron, zinc and vitamin C, and **Medika grape** is full of anti-oxidants that help fight cancer.

B. Improved Livestock for Livelihood security

- Four backyard poultry varieties were developed and released having more than double the egg production as compared to native/local breeds.
- '**Jharsim**' for Jharkhan and Bihar, '**Narmada Nidhi**' for Madhya Pradesh, '**Kamrupa**' for Assam and '**Himsamridhi**' for Himachal Pradesh are few example in this regard.
- A new advanced breed for sheep '**Abhishan**' has been developed for dry areas of the country which has shown the promise of raising the income of sheep farmers.
- To improve livestock health, an ambitious research program to develop indigenous vaccines and diagnostic kits was launched in ICAR institutes.
- In fisheries sector, the technology of **marine cage culture of high –value Cobia and Silver Pompano fishes** is proving a game-changer technology in coastal regions.

C. Integrated Farming for Improved Income

- Integrated farming system (IFS) approach has become a core research activity due to its potential to increase farmer's income and site-specific employment to small land holders.
- Additionally, it cuts-down cultivation cost through multiple use of resources and provides desired resilience to climate change scenario.
- IFS involves **synergic blending** of crops, horticulture, dairy, fisheries, poultry etc. to optimize use of by-products, residues and wastes generated in each system in compatible and sustainable manner.
- Integrated **rice-fish-poultry farming system** and **rice-fish-vegetable model** have successfully increased net income of farmers in southern and east region respectively.
- **Integration of Makhana with fish and water chestnut** not only increased farmer's income, but also generated employment at site.
- Scientists have also developed a unique system where farmers can grow **three different vegetables on the same piece of land** at a time.
- Called '**Three-tier**' system, this intervention has made a big impact in and around **Vaishali districts of Bihar**, and is gaining popularity in north Bengal and north-east region.

- Development of agri-voltaic system of fields is a breakthrough research, where electricity is generated by installing solar PV modules in fields and crops are cultivated in inter space area.
- Rain water is also harvested from top surface of PV modules.

D. Lab to Land

- A vast and **pan-India network of 692 Krishi Vigyan Kendras** are extending training and technology support to the farmers for quality seed, planting material and animal/fish seed product.
- To address the challenge of climate change at village level, ICAR and Department of Agriculture Co-operation and Farmers Welfare are working collaboratively to demonstrate 100 climate resilient and integrated farming technologies at farmer's fields. So far, 151 climate resilient villages have been established.
- Recently, the government dedicated the **Nanaji Deshmukh National Phenomics facility** to the nation that is located at the Indian Agricultural Research Institute, New Delhi. This state-of-art research facility will prove a boon to overcome the adverse effects of the changing climate on various agricultural crops.
- In a novel extension scheme named '**Mera Gaon Mera Gaurav**', four agricultural scientist work with five identical villages and share their experiences on agriculture and allied enterprises to solve the issues and problems of farmers at field level.
- 'Attracting and Retaining Youth in Agriculture' (ARYA) is another extension program which emphasizes entrepreneurship development and value chain management to attract and empower the youth in rural areas.
- A unique "FARMER first" scheme is an enriching Farmers-scientists interface through which scientists are working with more than 48,000 farm families to increase their income.

ICAR-Driver of Agricultural Research and Extension in India

The Indian Council of Agricultural Research (ICAR), established in 1929 is dedicatedly serving the nation as an apex body of agricultural research, education and extension under Ministry of Agriculture and Farmers' Welfare, Government of India. ICAR has successfully harnessed the power of science, technology and innovation for food security, farmer's prosperity and has catalyzed sustainable growth in agriculture sector.

Micro-Irrigation for Agricultural Growth

- India accommodates more than 17% of world's population, but the country has only 4% water resources and 2.5% land resources of the world. **Water is a scarce natural resource** and there is a huge demand-supply gap to meet the requirements of various sectors.
- Demand management is the most appropriate strategy to manage the scarce resources and according to **National Water Policy (2012)** by Ministry of Water Resources, Government of India, **water saving in irrigation has been given vital importance** to achieve water use efficiency.
- **Micro irrigation** is an innovative water saving technology in which water is directly supplied to the crops with very less conveyance and evaporation losses.
- The major advantage of this technology compared to traditional surface flooding method is that micro irrigation reduces *non-beneficial evaporation and non-recoverable percolation of water*. Hence, this technology boosts up overall water use efficiency.

- It helps to achieve higher cropping intensity and irrigation intensity through more focused application of water to crops.
- Different types of systems are **drip irrigation, sprinkler irrigation, micro-sprinkler, porous system, rain gun etc.**

Benefits:**i) Increase in water use efficiency**

ii) Energy efficiency - Micro irrigation requires minimum pressure and low flow rate only. Hence, this ensures energy consumption savings up to 30.5%.

iii) Fertilizer Use Efficiency - Proper mixing of fertilizers and water, control of optimum dosage and direct application of fertilizers to the root zone result in the saving in fertilizer consumption up to 25.8%.

iv) Productivity increase

v) Irrigation cost saving - This technology reduces the overall cost of irrigation due to decrease in labour requirement for irrigation, weeding and fertilizer application.

vi) New crop introduction - Farmers can judiciously add more new crops due to improved water scenario.

vii) Increase in farmer's income

- Pre-monsoon cultivation and early harvest are possible. Hence, the crop will not be affected even if the monsoon withdraws early or an insufficient monsoon.
- Recently, drip irrigation with mulching is used to prevent evaporation, maintain moisture, reduce weed growth, mitigate soil erosion and improve soil conditions.

Technology Promotion

- Government has initiated **micro irrigation in the Tenth Five year Plan (2002-2007)**.
- Micro-irrigation has been given special importance in **Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)** with the aim of extending irrigation cover ('Har Khet Ko Pani') and improving water use efficiency ('Per Drop More Crop') to improve various water development and management activities.

Streamlining Storage and Marketing

- Better storage and transportation facilities for agricultural products can add to the productivity of farm resources thus making domestic agricultural sector more competitive in international markets.
- Generally, the supplies of agricultural produce are dependent on weather and climate, the time period of biological growth process and the perishable nature of numerous agricultural products.
- Therefore, the supply of agricultural products is characterized by instability both quantitative and qualitative.
- **Storage and proper transportation** is the most important aspect of food supply chain that ensures food security and round-the-year quality food supply of a country.
- According to World Bank Report, the **food grains and perishables which are wasted due to improper storage could be sufficient to feed the one-third of world's poor populations.**

Strengthening Cold Storage/Warehousing

- Cold storage plays a vital role in reducing post-harvest losses of edible commodities by **increasing their storability and shelf-life**. Timely storage of perishable commodities in required temperature also makes their supply continuous.
- At present, 6227 cold stores are available in India with a storage capacity up to 3000 million tones.
- Present requirement of cold storage capacity for food products (fruits and vegetables) is around 61 million tones in India.
- Lack of cold storage space, is one of the major reasons behind higher post-harvest losses of fruits and vegetables in India which reach up to 25 to 40% of the total production on an annual basis.
- Two prominent changes that have created a significant growth prospects in warehousing are the **implementation of GST in India** and creating a unified taxation, and the **rapid growth of e-commerce** necessitating building of large scale warehousing across various locations.

Agricultural Marketing in India

- Agricultural Marketing involves all aspects of market system (functional and institutional), based on technical and economic considerations. It includes pre and post-harvest operations, assembling, grading, storage, transportation and distribution or marketing.

Government Initiatives for improving Agricultural Marketing

- The present policy framework for intervention in agricultural markets and prices can be broadly grouped under three categories-Regulatory measures; Market infrastructure and institutions; and Agricultural price only.

A. Agriculture Produce Marketing Committee Regulation (APMC) Act

- All the wholesale markets for agricultural produce that adopted the Agricultural Produce Market Regulation Act (APMRA) are termed as 'regulated markets'.
- The act mandates that the sale or purchase of agricultural commodities, notified under the Act, is to be carried out in specified market areas, yards or sub-yards.

The Advantage of APMC Act

- Removal of several malpractices and imperfections
- Creation of transparent marketing conditions.
- Ensuring a fair price to the farmers to sell their produce.

Need For Reform in APMC

- As per the needs of the prevailing situations, the **Inter-Ministerial Task Force on Agricultural Marketing Reforms** (2002) recommended that the APMC Acts be amended to **allow for direct marketing and the establishment of agricultural markets** in the private and cooperative sectors.
- The rationale behind direct marketing is that farmers **should have the option to sell their produce** directly to agri-business firms, such as processors or bulks buyers, at a lower transaction cost and in the quality/form required by the buyers.
- On the recommendation of the committee, the government had come up with a Model APMC Act in 2003.

Model APMC Act, 2003

- Under the model APMC Act, the private sector and cooperative can be licensed to set up markets. This act also has provision for contract farming and direct marketing by the private players.

- As a result on model act, the proportion of private trade and contract farming had increased manifold in some part of the country which benefited the both private sector as well as farmers.

B. E-NAM-An Electronic Portal for Agriculture Marketing

- The electronic National Agriculture Market (e-NAM) was launched in April 2016.
- e-NAM is an electronic trading portal which networks the existing Agricultural produce Market Committee (APMC) mandis to create a unified national market for agricultural commodities.
- Small Farmers Agri-business Consortium (SFAC) is the leading agency for implementation of e-NAM under the guidance of Ministry of Agriculture and Farmer's Welfare, Government of India.
- The main purpose of stabling e-NAM is to promote uniformity in agriculture marketing by streamlining of procedures across the integrated markets, removing and promoting real time price discovery based on actual demand and supply.

Paramparagat Krishi Vikas Yojana (PKVY)

- The Paramparagat Krishi Vikas Yojana (PKVY) was launched in April 2015 as **an elaborated component of Soil Health Management (SHM)** under the Centrally Sponsored Scheme, **National Mission on Sustainable Agriculture (NMSA)**.
- PKVY aims at **supporting and promoting organic farming** through adoption of organic village by cluster approach and PGS (Participatory Guarantee System) certification.
- The Scheme envisages the promotion of commercial organic production through **certified organic farming**, which provides more income to the farmers.
- For implementation of Paramparaget Krishi Vikas Yojana (PKVY) Groups of farmers would be motivated to take up organic farming. Fifty or more farmers will form a cluster having 50 acre land to take up the organic farming under the scheme.
- There is no liability on the farmers for expenditure on certification.
- Every farmers has been **provided Rs. 20,000 per acre in three years** for seed to harvesting of crops and to transport produce to the market.
- Organic farming is promoted by using traditional resources and the organic products will be linked with the market.

Boosting Agriculture Through Agri-Business

- Agribusiness sector involves four different sub-sectors. These are:
 - i) Agricultural inputs;
 - ii) Agricultural production;
 - iii) Agro-processing; and
 - iv) Marketing and Trade

Government Efforts To Promote Agri-Business

- ICAR has taken a lead to initiate a network of **25 Agri-business Incubation (ABI) Centers** in difference states of the country under the **National Agriculture Innovatin Fund (NAIF) Scheme**.
- These ABIs act as an effective platform for fostering the growth of **sustainable business endeavour and nurturing the techno-entrepreneurs**.

- Realising the importance of agri-business and motivating youth towards agriculture, a programme entitled “**Attracting and Retaining Youth in Agriculture**” (**ARYA**) was started during 12th Plan Period.
- Under this project, operational costs to support critical inputs like seeds, fertilizers, small equipment are being provided to farm youth. This provides additional opportunities to the unemployed rural youth in primary and secondary agriculture and related enterprises.
- In order to give more focus on the engagement of youth in agricultural activities, another programme named as **Student Rural Entrepreneurship Awareness Development Yojana (READY)** programme was started in 2015-16.
- **Student READY** is an essential course module for the award of degree at Bachelors level to ensure hands on training and practical experience depending on the requirements of respective discipline in agricultural Universities.
- The Student READY programme includes **five components** viz., **Experiential Learning, Rural Awareness Works Experience (RAWE), In Plant Training/Industrial attachment, Hands-on training, and Student Project.**
- A financial support of Rs. 3000/-per student per month for maximum six months is also provided to the students.
- In the Union Budget Announcement, (2018-2019), Government has decided to develop and upgrade existing 22,000 **rural haats into Gramin Agricultural Markets (GrAMs)** to work as centers of aggregation and to provide farmers with facility near to farm gate for making direct sale to consumers and bulk purchasers while improving their market access.
- The Government is implementing **Market Research and Information Network (MRIN) scheme** covering 3355 wholesale mandies across the country linked to Agmarknet portal, wherein Agricultural Produce Market Committees (APMCs) markets are reporting data on mandi arrivals and prices of their traded agricultural commodities on daily basis.
- The Government has launched an umbrella scheme “**Pradhan Mantri Annadata Aay Sanrakshan Abhiyan**” (**PM-AASHA**). Under PM-AASHA, the Department of Agriculture, Cooperation and Farmers Welfare (DAC & FW) implements the Price Support Scheme (PSS) for procurement of pulses, oilseeds and copra.
- **Minimum Support Price (MSP)** is notified by the Government for certain crops primarily for procurement.
- Government is providing **financial assistance to APMCs** for upgrading their infrastructure and improving their **forward and backward linkages** through various schemes such as **Agricultural Marketing Infrastructure (AMI), Mission for Integrated Development of Horticulture (MIDH)** and **Rashtriya Krishi Vikas Yojana-Remunerative Approaches for Agriculture and Allied Sector Rejuvenation (RKVY-FAFTAAR)** etc.
- **Mega Food Park and Cold Chain** scheme for setting up of food processing infrastructure have been in operation since 2008.
- Now under ‘**Pradhan Mantri Kisan Sampada Yojana (PMKSY)** promotion, modernization and capacity enhancement of food processing industries in the country has been initiated.
- It has seven planks namely (i) **Mega food Parks** (ii) **Integrated Cold Chain and value addition infrastructure** (iii) **Infrastructure for Agro-Processing Clusters** (iv) **Creation of Backward and Forward Linkage**, (v) **Creation/Expansion of Food Processing & Preservation Capacities** (vi)

Food safety and Quality Assurance Infrastructure and (vii) Human Resources and Institutions.

- Further a new central sector scheme names ad “**Operation Green**” for integrated development of **Tomato, Onion and Potato (TOP)** crops value chain.
- In order to provide credit at reasonable rate of interest at 7 per cent to farmers, the Government of India is implementing an interest subvention scheme of 2 per cent for short term crop loans up to Rs. 3.00 lakh through public sector banks and private sector banks.
- Currently, besides 2 per cent interest subvention, the framers, on prompt repayment of crop loans on or before the due date, are also provided 3% additional interest subvention.
- The benefit of interest subvention is extended for a period of up to six months (post-harvest) to small and marginal farmers having KCC on loan against negotiable warehouse receipts with the purpose of preventing distress sale of produce.

Irrigation: Key Inputs for Agriculture

- Increase in agricultural production and productivity depends a lot on the availability of water, and so irrigation plays an import role in this regards.
- According to the Food and Agriculture Organization of the United Nations (FAO), **the highest yields that can be obtained from irrigation are more than double the highest yields that can be obtained from rain fed agriculture.**
- High variability and inadequacy of rainfall makes irrigation a decisive factor for Indian agriculture.
- That is why, the Government has recently taken several steps to provide improved access to irrigation and to enhance water efficiency, primarily through and to enhance water efficiency, primarily through an umbrella scheme – **Pradhan Mantri Krishis Sinchayee Yojana (PMKSY).**
- PMKSY has been operationalised from 1st july, 2015 with the objective of enhancing irrigation coverage and improving the delivery system at farm level.
- The mission is administered by **Ministry of Water Resources**, River Development and Ganga Rejuvenation.

PMKSY has four components

- **Accelerated Irrigation Benefit Programme (AIBP) & Command Area Development & Water Management (CADWM):** To focus on faster completion of ongoing Major and Medium Irrigation including National Projects.
- **Har Khet Ko Pani (HKKP):** Creation of new water sources through minor irrigation strengthening and creation of distribution network from sources to the farm etc.
- **Per Drop More Crop (PDMC)**
- **Watershed Development (WD):** Ridge area treatment, drainage line treatment, soil and moisture conservation, rainwater harvesting and other watershed interventions.
- The government has approved an initial corpus of Rs. 5,000 crore for setting up of a **dedicated Micro Irrigation Fund (MIF) with NABARD**, under PMKSY.

Conclusion:

- The impart of irrigation development on crop output cannot take place instantaneously because of the time lag involved for making adjustments to the factors of production. However, this is a well-

documented fact that irrigation is one of the critical inputs to improve productivity in agriculture sector.

Accelerating Productivity Through Irrigation Management

Potential Interventions for Improved Irrigation Management

I. Accelerate and Improve the 'AIBP'

- Accelerated Irrigation Benefit Program (AIBP) is a flagship program of the government for improving the irrigation potential utilization through faster completion of the on-going projects.

II. Enhanced use of Underground Pipe Line (UGPL) and Canal Based Micro-Irrigation Systems:

- To overcome the long-drawn and costly process of land acquisition for laying out the On-Farm Development (OFD) works such as sub-minors, channels etc. the implementing agencies should consider replacing these with underground pipeline system which are faster to construct and avoid wastage of land.
- Such systems have found much favour with farmers in Sardar Sarovar Project in Gujarat.

III. Use of Improved Irrigation Techniques at the Farm level

- A number of simple and innovative irrigation management technologies are now available which can accelerate the agricultural growth:

(a) Laser Land Levelling

(b) Cultivation on raised beds: Permanent raised beds are especially suitable for regions with higher and uncertain rainfalls, heavy soil, wide thermal variations and farming systems requiring shorter crop turn-around time.

(c) Improved irrigation Management for Rice Crop

- *System of Rice Intensification (SRI)*- The success of SRI is based on synergetic development of both the tillers and roots. Rice yields under SRI are increased by 20-50%, sometimes > 100%.