
VAJIRAM & RAVI
AGRICULTURE REFORMS: TOWARDS DOUBLING FARMERS' INCOME

The Government has been reorienting the agriculture sector by focusing on an income-centeredness which **goes beyond achieving merely the targeted production**. It focuses on achieving high productivity, reducing cost of cultivation and remunerative price on the produce, with a view to earn higher profits from farming. At present the Government is implementing various schemes and adopting policy measures to synchronize with higher gains for the farmers:

I. For Higher Production through Productivity Gains

- **National Food Security Mission (NFSM)** - for cereal, pulses, oilseeds, nutri-rich cereals, commercial crops.
- **Mission for Integrated Development of Horticulture crops.**
- **National Mission on Oil and Oil Palm (NMOOP)** launched in 2014-15 for increasing production of oilseeds and Oil Palm.

II. For Reduction in Cost of Cultivation

- Soil Health Card
- **Neem Coated Urea** is being promoted to regulate use of urea, enhance availability of nitrogen to the crop and reduce cost of superfluous fertilizer application.
- **Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)** micro irrigation component with the motto of 'Har khet ko Paani'

III. For Providing Assistance to Small and Marginal Farmers

- **Pradhan Mantri Kisan Samman Nidhi (PM KISAN)** scheme with an aim to provide assistance to small and marginal farmer families with an amount of Rs. 6000/- per year.
- Now the Union Government has extended the scheme to all farmer families irrespective of land holding size, subject to applicable exclusion.
- **Pradhan Mantri Kisan Maan Dhan Yojna (PM KMY)** has been launched which provides for a payment of a minimum pension of Rs. 3000/- per month to eligible small and marginal farmers on attaining the age of 60 years.

IV. To Ensure Remunerative returns

- **National Agriculture Market Scheme (e-NAM)** to get improved remuneration for their produce, moving towards 'One Nation One Market'.
- **Farmer Producer Organizations (FPOs)** have been on-boarded on e-NAM portal.
- The Model Agricultural Produce and Livestock Marketing Promotion & Facilitation) Act, 2017 has been released to promote alternative competitive marketing channels for better pricing and to encourage private investment in developing efficient marketing infrastructure and value chain.
- Existing 22,000 rural haats to be developed & upgraded into **Garmin Agricultural Markets (GrAMs)**.
- **Warehousing and post-harvest loans** at concessional rate of interest so as to discourage distress sale by farmers.
- Minimum Support Price (MSP) is notified by the Government for certain crops periodically.
- Procurement of oilseeds, pulses and cotton are undertaken by central agencies at MSP under rice Support Scheme (PSS).

V. For Risk Management and Sustainable Practices

- **Pradhan Mantri Fasal Bima Yojana (PMFBY) & Restructured Weather Based Crop Insurance Scheme (RWCIS)** provides insurance cover at all stages of the crop cycle.
- Government provides total interest subvention up to 5 per cent (inclusive of 3 per cent prompt repayment incentive) on short-term crop loans up to Rs. 3.00 lakh.
- **Praramparagat Kroshi Viaks Yojana (PKVY)** is being implemented with a view to promote organic farming in the country.
- **Mission Organic Farming in North-East- MoVCD (NE)** for realizing the potential of organic farming in the North Eastern Region of the Country.

VI. Allied Activities:

- **'Har medh par ped'** launched during 2016-17 to encourage tree plantation on farm land.
- **National Bamboo Mission** has for value chain based holistic development of this sector as a Supplement to farm income.
- **Bee-keeping** has been promoted under mission for integrated Development of Horticulture (MIDH)
- For diary development, there are three important schemes: **National Dairy Plan 1 (NDP-1)**, **National Dairy Development Program (NPDD)** and **Dairy Entrepreneurship Development Scheme**.
- Foreseeing high potential in fisheries sector, a Blue Revolution with multi dimensional activities mainly focusing on fisheries production, both inland and marine is being implemented.
- **Rashtriya Gokul Mission** launched in December 2014 for gene pool of indigenous cattle and buffaloes.
- **National Livestock Mission** launched in 2014-15 to ensure intensive development of livestock.

Conclusion:

- It is hoped, that the answer to agrarian challenges and realization of the aim of farmers' welfare lies in higher and steady incomes. Notwithstanding the many face of challenges, India's agriculture has demonstrated remarkable progress.

ROAD MAP FOR AGRICULTURE REFORM

- The Government constituted a **High Powered Committee of the Chief Ministers of 7 States-** Maharashtra, Karnataka, Haryana, Arunachal Pradesh, Gujarat, Uttar Pradesh, Madhya Pradesh and Union Minister of Agriculture, Rural Development & Panchayati Raj with Member, NITI Aayog as the Member-Secretary.
- With this committee, the agenda for Transformation of Indian Agriculture and reforms initiated in 2014 gets sharpened.
- Low price realization, excessive intermediation in trade and low private investment in infrastructure development are some of the priority areas of reforms that need concerted efforts of all stakeholders. The vast gap in infrastructure is also a serious constraint which will require immediate attention.

A paradigm shift is required

- India will be home of 1.6 billion people by 2035. The per capita availability of land, water and other finite unnatural resources will decline. The food grain demand is estimated over 340-356 million tonnes by 2033.

- The **policies and investment priorities in and for agriculture** can be aligned for income security and inclusiveness.

Areas Of Reform:

A. Research and Technology

- The productivity of agricultural commodities in India is lower than any global benchmark. Much of the technology developed in public sector labs does not flow to farmers due to **weak extension** or inadequate delivery mechanism.
- The future of agriculture in India lies in how much we are investing in agri Research and Development (R&D) today. Agriculture R&D has to innovate for precision agriculture, varieties with higher nutritive and processable traits, climate smart technologies, cyber-agro-physical system for generating artificial intelligence based farm and market advisories.
- The frontier areas like gene editing, genomics, artificial intelligence, Nano technology are ushering in 4th Industrial revolution need special attention.

B. Water-Governance

- As close to 84 per cent of fresh water is used in agriculture, both demand and supply side management through reforms are crucial in India.
- The large gap between potential created and utilized has been a matter of concern as out of 112.53 million ha created irrigation potential only 89.53 million ha is utilized.
- Fortunately, the Government, through PMKSY provided overarching governance.
- The **Jal Shakti Abhiyan** may focus on water conservation. A major reforms in the micro irrigation scheme is necessitated to transform it from individual farmer subsidy driven programme to area based public-private business model covering installation, repair and maintenance of the micro irrigation systems.
- The water governance should focus on **micro-irrigation and water budgeting** based on a strong traiffs regime.

C. Reforms in Fertiliser Sector

- The strong advocacy for **Zero-Budget Natural Farming** (ZBNF) has been noticed in recent past.
- While consensus on phasing out the fertilizer subsidy is yet to be evolved, the rationalization of the regime is necessary. The strategy to introduce NBs for all major nutrients should be evolved at the earliest. DBT in fertilisers has been a great success. The soil Health Card scheme is one of its kinds with 100 per cent penetration to every farm household.
- Despite launching of Pradhan Mantri fasal Bima Yojana, the timely and precise estimates and pay outs are the real challenge being faced by the scheme. The precision of record of area insured and the extent and intensity of damage for speedy pay outs is the challenge.
- So far the States identify and **accept the Crop cutting Experiments** (CCE) data. Hence, conducting adequate number of CCEs though significant is yet the most challenging for the success of PMFBY. States have to reform to accept and include technologies like remote sensing, drones, smart phones etc.

D. Credit in Need to Needy

- The **Sarangi Committee** (2016) recommendations on interest subvention are implemented by the Government. The interest subvention on the short-term crop loan up to 3 lakh and Kisan Credit Card

scheme have been made broad-based to include term credit and consumption needs, besides some risk cover against accidental death.

- However, the **equitable distribution of credit** amongst farmers and regions is the concern. The institutional credit is also not available to tenants or lessee cultivators.
- The States should reform their land leasing laws based on the **Model Act on Agricultural Land Leasing, 2016** prepared by NITI Aayog.
- The alternate system of banking in the form of banking correspondence should be strengthened in regions with low density of rural banks.
- The value of farm output can be increased substantially by diversifying from field crops to fruits and vegetables. **Diversified farming in A.P. Gujarat could be attributed for rapid decline in rural poverty during last 15 years.**
- The directed diversification can only happen if farmers are given the full right to sell their produce to whomsoever they want. A well-functioning **system of contract farming** will go some distance towards providing a guaranteed price as well as necessary technical support to the farmer.
- Reforms in contract farming, tariff and tax regimes, credit is pivotal for achieving commercialization in agriculture. The policies that facilitate the development of food processing industry will go a long way towards creating demand for high value commodities.

E. Manage post-Harvest

- The **annual post-harvest losses** are estimated at Rs.92651 crore. Reforms in **Essential Commodity Act** relating to stock holdings and storage could reduce the losses to great extent. The **Agriculture Export Policy** is a new beginning which must be strengthened.
- The initiatives of e-NAM and **Gramin Agricultural Markets** will have far reaching consequences.
- The Government can also **evolve two competing agri-market systems**-one through APMCs, and second through integrated value chain models. The FPOs/Joint Liability groups can be promoted to channelize the small growers into the value chain.

F. Minimise The Price Shocks

- The MSP implementation has **never been inclusive for produce, producer and geographies**. It also induced changes in production pattern favouring for water guzzling crops.
- The Government, in the Budget 2018-19, announced for introducing MSP 1.5 times of production cost. NITI Aayog and Ministry of Agriculture in consultation with the states suggested **Price Deficiency Payment System**, and **Private Stockiest Procurement System as the alternate mechanism**.
- The states should also enact their APMC laws based on the Model Agricultural and Livestock Marketing (APLM) Act, 2017 to facilitate out-of-mind transactions, exemption of market fee on perishables, electronic marketing etc.
- The Government in May 2018 launched the **Model Act on Contract Farming** to empower the farmers to decide their price and negotiate with the sponsor.

G. Make Indian Farmers Competitive

- Since liberalization, the private sector helped in significant investments in some sectors. The poultry sector is one such example which grew into a well-organised industry. The commercial vegetable production is gradually picking up.

- The revolution in ICT has enable farmers and producers to learn and adopt better practices and access marker information.
- The private sector may be encouraged to supplement investments in high-risk high-potential project. The 'state of the art' food tasting lab could be established for testing of quality standards.
- A consistent policy regime at least for some specified period will establish India as a good buyer and seller of agri-commodities helping the domestic producers a long way.

H. Turning Small Into Big

- The grouping of small and marginal farmers into FPOs is the game changer for those who own less land. The budget 2019-20 provided push to set up more FPOs.
- The modernization of income tax laws allowing *exemption to FPOs income, approving direct marketing by FPOs to buyers and single state-wide license for trading of the inputs* are some reforms needed immediately.
- The current legal structure of FPOs does not provide for external equity infusion or commercial borrowing. This may be solved thought a *provision for collateral free loans to FPOs up to Rs.25 lakh from the financial institutions. The rate of interest to FPOs may be rationalized to the rate of individual farmers for crop loans.*
- The FPOs registered under companies Act may also be made eligible for loans from the cooperative banks, etc. Treating FPOs registered as FPCs at par with the cooperatives for all sales tax exemptions could help them immensely.

Conclusion

- The prime function of the Government agencies is to create an ecosystem for the larger acceptance for the reforms. The requires three things-**information, intelligence and interaction**. A paradigm shift is required to look agriculture differently.

Agriculture Sector in India: Current scenario

- India's economic growth in FY 2019 is estimated at **6.8 per cent percent**. Agriculture accounts for **nearly 18 per cent of GDP**, and employs almost half of country's total workforce.
- 2017-18, total food grain production in India was estimated at 275 million tonner (MT). India is also the **largest producer of pulses** in the world accounting for 25 per cent of global production.
- India's annual milk production in 2017-18 was 165 MT, making India the largest producer of milk, jute and pulses.
- India is also the second-largest producer of rice, wheat, groundnuts, cotton and sugarcane.
- It is also the second-largest fruit and vegetable producer, accounting for 10.9 per cent and 8.6 per cent of the world fruit and vegetable production, respectively.
- Share of agriculture sector in total exports of the country is 11.76 per cent for the year 2018-19.

Key Challenges Facing the Indian Agriculture Sector

- Impediments such as decreasing size of agricultural land holdings, poor transport infrastructure, poor storage facilities, lack of use of modern technology, lack of proper irrigation facilities and inadequate access to irrigation which result in over dependence on monsoons, loss of soil fertility,

inadequate access to agriculture credit and lack of marketing support hamper the agricultural productivity.

- It becomes extremely difficult to store and subsequently transport agricultural produce from remote areas, owing to lack of cold storage and transportation facilities.
- Access to agriculture credit is directly dependent on land holding titles. Due to this reason, small and marginal farmers, who account for than half of the total land holdings, and who do not hold formal land titles, are unable to access institutionalized credit.

BEST FARMING TECHNIQUES IN INDIAN SCENARIO

- Availability of foodgrains per person in India has increased from **455 g per capita per day to over 518 g**, even as the country's population swelled from 683 million to nearly 1300 million.
- Despite the increased availability, **best management practices** are essential to increase agriculture productivity and livelihood of farmers, especially marginal and small farmers.
- There are many such practices which are able to sustain production and productivity without deteriorating soil health and environment. These are:

A. Conservation Agriculture (CA)

- CA has been viewed as an important strategy against food security challenges posed by climate change. In rice-wheat dominated region (western Uttar Pradesh and Haryana) farmers burn the crop residues in-situ to clear the fields and make them ready for the next crop, which cause a very serious atmospheric pollution problem.
- Heat and moisture stress are other serious issues of crop production. Thus, conservation agriculture has a good scope in this geographically important region.
- Conservation Agriculture is defined as a sustainable agriculture production system. It comprises of a set of farming practices adapted to the requirements of crops and local conditions of each regions. The farming and soil management techniques protect the soil from erosion and degradation, improve its quality and biodiversity, and contribute to the preservation of the natural resources, water and air, while optimizing yields.
- The CA shouldered by **three major pillaring principles**, viz.,i) **minimum soil disturbance**; ii) **maintenance of permanent soil covers** and iii) **cropping system diversity, crop rotations**, which must be fulfilled to CA objectives.
- Government of India has **made provision of Rs. 1140 crore in the Budget 2019-20** for eco-friendly management of crop residues especially rice and wheat residue in Northern plains.
- CA based crop management practices not only enhance crop productivity but also reduce cost of production and maintain soil health.

B. Integrated farming systems (IFS)

- IFS will be more resilient and adaptive to climate variability. **Integration of livestock rearing with crop production** gives higher economic returns as compared to crop production alone.
- Farm research in different regions of the country has resulted in identification of many sustainable and profitable IFS models for rainfed areas.
- For example, in areas where the rainfall is more than 1,100 mm, IFS module integrating paddy with fisheries is ideal.

- Under irrigated areas the following IFS models are most suitable to maintain soil fertility and productivity:

- Intensification and diversification of crop component of farming system.
- Diversification of other components of farming system for higher income.

C. Precise Nutrient Management And Soil Health Cards

- Site-Specific Nutrient Management relies on principles of '**5Rs**', **the right time, the right amount, the right place, the right source, and the right manner**. The Site-Specific Nutrient Management (SSNM) approach emphasizes 'feeding' crop with nutrients as and when needed.

D. Efficient Water Management

- Both in-situ and ex-situ rain water management play crucial roles for increasing and sustaining the crop productivity. In the union budget of 2018, under the '**Har Khet ko Pani**' a component of PMKSY scheme, the ground water irrigation scheme was implemented in 96 districts where less than 30 per cent land is currently getting an assured irrigation facility. The pressurised micro irrigation systems not only save water in food grain production but also contribute to higher productivity, cost effectiveness, higher water productivity and energy use efficiency.

E. Organic Farming

- Organic food products are considered to be much safer and nutritious than the products produced by the conventional farming. Organic farming also helps to restore soil health, protect environment, enhance biodiversity, sustain crop productivity and enhance farmers income.

F. Crop Diversification

- It is paramount importance in mitigating the environmental problems arising on account of monoculture. Inclusion of legumes in cropping systems has been found to be effective in reducing the nitrate leaching in lower profiles. There is need to diversify crop cultivation with pulses, oilseeds, fibre crops along with high value crops like fruits, vegetables, flowers, medicinal etc. as per agro-climatic conditions.

G. Resource Conservation Technologies (RCTs)

- RCTs refer to those practices that conserve resources and ensure their optimal utilisation and enhance input use efficiency. These techniques include zero or minimum tillage (save fuel), laser land levelling that save irrigation water, system of Rice Intensification (SRI) etc.

H. Integrated Crop Management (ICM)

- ICM suggests the use of Good Agricultural Practices (GAP) such as **Integrated Nutrient Management (INM)**, **Integrated Weed Management (IWM)**, **Integrated Disease Management (IDM)** and **Integrated Pest Management (IPM)**, etc., for raising a good crop.
- Thus, ICM is an alternative system of crop production, which conserves and enhances natural resources while producing quality food on an economically viable and sustainable foundation. ICM is particularly beneficial for small and marginal farmers because it aims to minimise dependence on purchased inputs while utilizing on-farm resources.

I. Small-Farm Mechanisation

- Improved access to the farm machinery for sowing, harvesting and other operations is an important adaptation strategy to deal with climatic variability. Many efficient low-cost farm implements were designed for various operations.

- In the recent past, custom-hiring of agricultural machinery became an appropriate institutional arrangement which promotes mechanization of agriculture operations on small farms.
- For the first time, a systematic attempt has been made under the **National Innovations on Climate Resilient Agriculture (NICRA)** to setup one custom-hiring centre each at the 130 climatically vulnerable villages across the country.

J. Climate Smart Cropping

- In the changing climate scenario, developing cultivars resistant to climate change may become important adaptive mechanism. For example, crop varieties those are **resistant to lodging** (e.g., short rice cultivars), may withstand strong winds during the sensitive stage of crop growth, are viable alternative.
- Adaptive measures like **change in crop calendar** to reduce the negative effects of increase climatic variability in arid and semi-arid tropics prove advantageous in avoiding extreme weather events.

K. Protected Cultivation

- Protected cultivation or greenhouse cultivation is the most contemporary approach to produce horticulture crops. It is also known as **Controlled Environment Agriculture (CEA)** and is highly productive, encourages water and land conservation as well as protects the environment.
- The technology involves cultivation of horticultural crops in a controlled environment wherein factors like the temperature, humidity, light, soil, water, fertilisers etc. are manipulated to attain the maximum produce as well as allow a regular supply of them even during off-season.
- This becomes relevant to farmers having small land holdings who would be benefitted by a technology, which helps them to produce more crops each year from their land, particularly during off-season when the prices are higher. This kind of crop production system could be adopted as a profitable agro-enterprise, especially in peri-urban areas.

EMPOWERING WOMEN FARMERS

Women in Agriculture: Statistics

- **According to the 2011 Census**, the total number of **female workers engaged in agriculture activities in India stood at 65 per cent**, with 30.3 per cent of the total cultivators and 42.6 per cent of total agriculture labourers being women.
- Furthermore, the Agriculture Census conducted every five years by the Department of Agriculture, Cooperation and Farmers Welfare (DAC&FW), established that the 12.78 per cent of the female operational holdings in agriculture during the year 2010-11 have increased to 13.78 per cent during 2015-16.

Steps Taken:

- The DAC&FW dedicatedly implements farmer welfare programmes and schemes. The Women Component Plan requires the **state governments to allocate 30 percent** of the funds for the welfare initiatives catering to the women farmers
- There have been myriad efforts to bolster women's role in agriculture activities. For instance, the foregrounding, recognizing and mainstreaming of women's role in agriculture as encapsulated within '**The National Policy on Farmers**', 2007.
- With a view of creating a women sensitisation module encompassing '**pro woman initiatives**' the **National Gender Resource centre in Agriculture (NGRCA)** was setup in the DAC&FW in 2005-06.

The “**Women Farmer Friendly Handbook**” enumerates the special provisions that empower women in multifarious ways, some of them include-

1. **Support for Women Food Security Groups (FSGs)**
2. **Procurement of Agriculture Machinery & Equipments (Subsidy Pattern)-** Women farmers can avail benefits in tandem with, or over and above the benefits offered to men.
3. **Representation of Women Farmers** – It is imperative for women farmers to be included in the decision making bodies.
4. **Promoting Woman Groups**
5. **Integrated Scheme for Agriculture Marketing (ISAM)** - Women are endowed with subsidies for storage infrastructure that includes a 33.33 per cent subsidy (on capital cost) for women as compared to 25 per cent for men.
6. **Agriculture Insurance-** Safeguarding coverage of women farmers along with a budget allocation and utilization in accordance with the population proportion.
 - The Agriculture and Farmers Welfare Ministry established Indian Council of Agriculture Research, ICAR, a **Central Institute for Women in Agriculture in Bhubaneswar, Odisha** in the year 1996. The Institute has been undertaking numerous studies on gender implications in the agricultural sector and developing women-centred technology.
 - It is also working to mobilise the Self-Help Groups with a view to increase the income generation of female participants in agriculture and animal husbandry.
 - With the aim to fortify agriculture research and enhance agricultural productivity to bolster farm income, ICAR has initiated the **All India Co-ordinated Research Project (AICRP)**. Its **Krishi Vigyan Kendras (KVKs)** have successfully trained about 3.1 lakh women agriculturists.
 - There is also a provision under the **National Food Security Mission (NFSM)** that provides training based on cropping system to farmers including the SC, ST and women farmers to generate awareness on augmented technology for increasing crop production and yield.
 - **15th October** of every year was marked as the **Women Farmer’s Day** by the Ministry of Agriculture and Farmers welfare in the year 2016.

Conclusion:

- According to the Economic Survey of 2017-18,”with **growing rural to urban migration by men, there is ‘feminisation’ of agriculture sector**, with increasing number of women in multiple roles as cultivations, entrepreneurs, and labourers.”
- The survey rightly suggests for adopting “gender specific interventions” in agriculture to “increase productivity” and enhancing “agricultural value chain”.
- Women in the agriculture sector have come a long way and an increased participation with whole-hearted practical implementation of the training skills received is the way forward for them.

CHANGE IN PUBLIC SERVICES FOR POORER SECTION

- In a vast country like India, the **deliverance of necessary public services to the most deprived families, depends on:** (i) evidence-based selection of beneficiaries, (ii) policy measures based on deep research (which would have the provision for timely necessary reforms), (iii) reducing human intervention by the availability and maximum utilization of information technology resources, and (iv) evolving an effective coordination among various agencies working under the federal structure.

- Keeping in view the infrastructural deficiencies, vast geographical areas and very few habitation in the interiors and far flung areas nearly inaccessible, this becomes a matter of great urgency.

Changing Scenario:

- During the last few years, programmers like **Gram Swaraj Abhiyan** conducted in the Rural Development Sector have been completely transparent. In fact, these programmes are excellent examples for preparing a reliable public service system.
- The **finalization of Socio-Economic & Caste based Census (SECC) 2011 data analysis** in July, 2015 was necessary to authentically identify the families living in scarcity.
- The BPL list prepared in 2002 containing those living below the poverty line had then become a privilege of the Gram Pradhan and it often excluded those who were genuinely poor. It is easier to identify the parameters of scarcity through the SECC.
- **Selection beneficiaries for LPG connection-Saubhagya**, housing through Pradhan Mantri Awas Yojana-Gramin (PMAY-G) and medical assistance in hospitals through the Ayushman Bharat was done on the basis of scarcity-related parameters of the SECC. This database does not have any link with religion, caste and class. It is based on the **scarcity parameters showing different aspects of poverty**.
- The **administrative and financial reforms** like proper identification of poverty, revision of data and its updation, Adhaar, IT/DBT, geo-tagging of assets, Public Financial Management System (PFMS) etc. **could be adopted through the participation of Gram Sabhas. As a consequence, great improvement is seen in the condition of leakage.**
- Owing to schemes like MGNREGA, major reforms including transfer of money into the accounts of the poor, creation of sustainable assets and livelihood security got a big boost.
- **Personal Benefit Schemes** have been introduced as an assistance to the poor to enable them to work for 90-95 days for constructing their own houses.
- In a study by Economic Development Institute conducted in 2018, it was observed that **76 per cent of newly created assets were of good or very good quality**.
- Evolving a reliable public system for MGNREGA and its efficient implementation is an important step.
- **Under the rural housing scheme**, phase-wise geo-tagged pictures have also been uploaded in the public domain. Best experts have studied designs of traditional houses in different regions in order to promote diversity throughout the country. Today all kinds of amounts are transferred into electronically verified accounts. With the effective use of technology, **annual rate of completion of construction of houses has increased almost 5 times**.
- Many persons are now beneficiaries of Ayushman Bharat and women are members of Self-Help Groups with bank linkage under DAY-NRLM.
- Despite remarkable community based unity of women through SHGs under the National Rural Livelihood Mission, much more is yet to be done for bringing diversity in livelihood and providing bank linkage.
- Due to much **emphasis laid on bank linkages**, loans amounting to more than rupees two lakh crore has been sanctioned to 3 crore women under the NRLM during the last five years. **This has resulted in larger level of diversification in livelihood**.
- For promotion of enterprises, the MoRD has ensured more than 67 per cent employment opportunities under DDU-GKY and more than two third jobs under RSETI programme.

- **Huge funds have been transferred to Gram Panchayats under the 14th Central Finance Commission.** Efforts have been made to make the entire process fully accountable and transparent through **geo-tagging, IT/DBT and PFMS under the MGNREGA and PMAY-G.**
- Accountability will increase more with electronic monitoring of accounts under PRIASOFT, geo-tagging of assets, transfer of funds through transaction based MIS and unitary nodal account.
- The Gram Swaraj Abhiyan was a unique effort of the government for **overall coverage of each and every person in 63974 villages of the country through the seven major public welfare schemes.** Under this programme, benefits relating to Ujjwala for LPG connection, Saubhagya for electricity, Ujala for free LED bulbs, Mission Indradhanush for vaccination, Jan Dhan for bank accounts and insurance for contingencies as well as life insurance were provided to each and every household at their door steps.
- Same kind of efforts were made in respect of rural roads under the Pradhan Mantri Gram Sadak Yojana (PMGSY). 130 to 135 km length of roads were constructed every day during the last 1000 days and it became possible due to effective monitoring and continuous dialogues with the State Governments.
- It has been established through the rural road scheme, **how public scheme like PMGSY can provide public service within the stipulated time and at an optimal cost.** In order to decrease the carbon footprint and to provide a lasting base for development, more than 30,000 km of roads were constructed through green technology, using waste plastic material.

Conclusion:

- We need to understand that in social sector, programmes pertaining to education, health and nutrition for poorer people, among many other public services, still need community-led and community-owned public service delivery system which is result oriented.
- The ultimate goal of such system should be centred on welfare and improvement in the living conditions of the poor. We cannot now retreat from the process of creating a reliable public service system as it is essential to bring in change and improvement in the living conditions of the deprived.

E-NAM: GAME CHANGER IN AGRICULTURAL MARKETING

- E-NAM or Electronic National Agriculture Market is a pan-India trading portal launched in April 2016. It is a trading portal for farm produce which **aims to create a unified national market for agricultural commodities by integrating Agriculture Produce Market Committees (APMC).**
- The main aim of e-NAM is to improve the marketing aspect of the agriculture sector with one license for the entire state and with single point levy.

Performance of e-NAM since 2016

- e-NAM facilitates profits through better marketing. Real-time information on prices creates healthy competition among buyers and increases farmers negotiation capabilities. E-NAM is transforming the way India trades in farm produce and has roped in 585 mandis across the 16 states and 2 Union territories.
- E-NAM trades in 150 commodities, and goods worth Rs 52,173 crore have been traded so far.
- For faultless operations, it makes three major change in the agricultural marketing laws of states like provides electronic trading, single trading licences that are valid in all mandis in a state and a single-window levy of transaction fees which makes e-NAM a transparent system for regulated fair trade.

e-NAM A Step Forward

- NAM provides the farmers more options for sell of their produce at nearest mandi or even in inter-state. For the traders, NAM offers the opportunity to access a larger national market.
- Taking eNAM a step forward, a farmer from any state sold their crops to the traders in other state. Similar inter-State transactions between **e-NAM mandis in Uttarakhand and Uttar Pradesh** in vegetable crop such as potatoes, brinjal and cauliflower since 2019 have commenced.
- One of major issues that hinders seamless transactions on eNAM is the non-availability of a trading license for traders other than those from the home state. The government has been pushing the States to **adopt a universal license for uninterrupted trading between states**.
- The e-NAM platform has an inter-state dashboard to promote inter-state trade. To increase its adoptability, many initiatives have been undertaken by the government such as:
 - Simplifying registration of farmers on the portal
 - Intensifying payment options
 - Extending e-NAM trading in six languages with availability of portal in 8 languages.

e-NAM as a Game Changer

- No middlemen involved in buying-selling of agri-products; hence better deal for farmers.
- Less transaction cost.
- Single license valid across all connected mandis
- Single point levy of all products
- Quality testing procedure introduced for buyers and sellers

e-NAM: Still needs improvement

- Niti Ayog's review on e-NAM has found that **many mandis are ill-equipped** to access the quality of produce. Without quality assaying quality assurance could not be provided to the potential buyers.
- It has also been reported that at some mandis auctions were occurring in the traditional way and data was entered into the e-NAM portal after the complete transaction. This defeats the purpose of an online portal.
- Therefore, a need to improve the assaying bodies for quality assurance to the buyers and also timely interaction is needed for changing tradition way of auction to e auction on e-NAM.

PUBLIC-PROVATE PARTNERSHIP ON AGROCULTURE SECTOR

A public- private partnership (PPP, 3P or P3) is a long- term cooperative arrangement between two or more public and private sectors.

Genesis of PPP

- The **PPP Cell set up in 2006** in Department of Economic Affairs (DEA), Ministry of Finance, **acts as the Secretariat for Public PPP appraisal Committee (PPPAC), Empowered Committee (EC) and Empowered Institution (EI)** for the projects proposed for financial support through Viability Gap Fund (VGF).
- As per the 2015 Infrascope Report of the Economist Intelligence Unit, **India ranks first in the world in operational maturity for PPP projects**.

- **Maharashtra is the pioneering** state in adopting P3 model in case of major infrastructure development projects.

Dimensions of PPP in Indian Agriculture

- Annual average growth rate of Indian agriculture has been around 2.7 per cent during the past years, **making it the slowest growing sector**. The challenges being faced by agriculture sector underlines an urgent need for innovations brought via partnerships between private and public sectors.
- Maharashtra, the first state to take this innovative path, rolled out its **Maharashtra Public- Private Partnership for Integrated Agriculture Development (PPPIAD)** project to develop integrated value chains for selected crops through PPP and co-investment.
- Successful partnerships between public and private sectors **are challenged by issues like high transaction costs of operationalizing and coordinating the partnerships, different objectives of each sector, negative perceptions and mutual mistrust as well as uncertainty about actual benefit and outcome from.**
- A major game changer for agriculture sector can be the PPP model. PPPs can transform the sector at multiple levels bringing together the collective power of all stakeholders in agricultural ecosystem.

A. PPPs In Research

- Many of the studies on PPPs focused on agricultural biotechnology, biosafety regulation, Intellectual Property Rights (IPR) and ways in technology transfer in support of pro-poor in developing countries.

B. PPPs in Extension

- PPPs cover a wide range of areas including extension services which could enhance technology adoption for sustainable development.
- **Agricultural Technology Management Agency (ATMA)** facilitated commodity- based groups to partner with private agencies in production and marketing of basmati rice and medicinal plants in Bihar, maize in Andhra Pradesh and mango in Maharashtra.
- It is difficult to get immediate results as PPP in extension will take considerable time for change in the mindset of the farmers in terms for participation, adoption and acceptance.

C. PPPs in Market and Infrastructure Development

- The Model APMC Act of Government of India encourages direct marketing to enable the farmer get the best price for their produce and create partnerships with banks, finance and logistics companies for lowest cost financing and marketing. This attracts private investment in creation of much needed marketing infrastructure, create competition and ensure better service to the farmers.
- Direct marketing like ITC e- choupal and the National Dairy Development Board model of public-private partnership provides a viable alternative for small farmers.
- PPP can facilitate the use of micro-irrigation resulting in enhanced irrigation efficiency. Integrated micro-irrigation networks are being developed through PPPs.

Impact of PPP Models In Agriculture

- The impact of PPP depends on involvement of institutions on collaboration and combining all available public and private skills.

1. Knowledge Management

- Knowledge management strategies in the context of PPP could result in increased production and better services delivery. A successful PPP approach in *Patna district of Bihar has brought*

replacement of traditional rice varieties with basmati rice, cultivation of medicinal and aromatic plants and mushroom.

2. High-End Technologies Development

- PPPs have facilitated the development of high-end technologies, which have improved efficiency in management and institutional intellectual property management skills and information database on available technologies in the public sector.

3. Building Farmers' Resilience to Environmental Shocks and Minimizing Risks and Uncertainties

- PPPs help the agricultural sector to deal with weather shocks, and enable farmers to de-risk themselves through insurance, etc.

4. Farm Mechanisation

- John Deere, a leading farm implements manufacturing company has established eight Agricultural Implements Resource Center each covering 600 acres of cultivated land in Gujarat. This PPP has helped to promote mechanized farming in tribal region.

5. Social Mobilisation

- Development departments develop partnership to create a better social linkage through SHGs, Farmers' Clubs, farmers cooperative groups etc.
- Agricultural Technology Management Agencies (ATMA) facilitated creation of large number of Farmer Interest Groups (FIGs) in different states in India which collaborate with private extension players resulting in direct marketing of many farm produce.
- A producer group consisting of tribal men and women farmer was formed in Khurda district of Odisha in 2011 to produce and sell maize through PPP mode.

6. Productivity Enhancement

- ICAR and Department of Biotechnology, have initiated the dialogue with Monsanto for transfer of Bt cotton technology in India. Subsequently, Mahyco partnered with Monsanto, and introduced Bt cotton in India. It resulted in an increase of area and productivity to cotton and real cost of production reduced.

7. Economic Empowerment of Farm Women

- The PPP between Kerala Agricultural University, DBT and Cadbury India during past 23 years trained 250 women and established 28 cocoa chocolate units in different parts of Kerala.
- PPP has been found to do gender mainstreaming making it possible for farm women to increase the access of technologies, inputs, credits and markets and eradicating gender differences and discriminations in rural area.

8. Investing in Smarter Value Chains

- Food-processing industry, one of the sunrise sectors within the agricultural domain, supported by investments by the government and the private sector, can provide farm extension services, enhances price realization, cut out intermediaries and improve the supply chain through forward and backward linkages.

Limitations of PPP Models in Agriculture

- Private sector seed companies in India tend to concentrate on hybrids where returns are high and assured.

- The private extension services focus on resourceful areas, resource-endowed farmers and limited to the profitable crops and areas, thus varying widely.

Challenges of PPP Approach and Way Forward

- It is difficult to standardize a PPP format because of the parameters used in structuring of PPP cannot be the same every time.
- The **lack of transparency** is one of the most discussed problems related to PPP. The long time taken for creation of PPP arrangement and number of formalities required to follow happen to be another issue in implementation of PPP approach. Undue political favors in many cases are gained by the private party.
- A PPP project has to mainly pass through four main phases viz. Project preparation, project procurement, project development and operations. Each of these stages require a careful handling planning and clear-cut demarcation lines of work.

Conclusion:

- The Government of India has been emphasizing to create a facilitating environment for investments in infrastructure building following PPP approach.
- Partnerships between public and private sectors combine and draw upon the best features of both sectors to render quality services. There are some successful PPP models in agriculture, however, it is a long way to go to have desired successes in Indian agricultural sector.

IRRIGATION TECHNIQUE TO GET PER DROP MORE CROP

Water is the most critical input for crop cultivation and the efficient use of available water resources is vital for sustainable agriculture development. Since more than 80 per cent of available water is used for irrigation, high priority has been given to water conservation and irrigation water management .

India's Agricultural Area

- The Government classifies agricultural areas as rained areas and irrigated areas. Areas where irrigation is **less than or equal to 30 per cent of the net sown area are called rainfed** and more than 30 per cent of the net sown are known as irrigated areas.
- India's irrigated agriculture has two parts: (i) **Surface (canal) irrigation** development due to high public investment by the states and (ii) **Over development of groundwater** resources due to private tube well development
- Ground water sources are over – exploited in many regions and are chronically water stressed in some regions.
- Augmentation of water supply initiatives may be water control measures, bench marking of irrigation projects, reforms in water harvesting norms, refocusing on tanks and ponds.
- Demand management initiatives may be Micro irrigation techniques such as drip and sprinkler, improving soil health, weather based crop insurance, market improvement and capacity building.

Micro irrigation Technologies

- Micro irrigation technologies mainly sprinkler irrigation and drip irrigation not only helps in water saving but also in reduction in fertilizer usage, labor expenses and other inputs and input costs.

Improved Irrigation Methods

- Since 8th plan, Department of Agriculture, has been promoting **Micro Irrigation (MI) methods** like drip irrigation and sprinkler irrigation. Later MI was launched as centrally sponsored scheme (CSS) in 2005 -06.
- It was up-scaled to **National Mission on Micro Irrigation (NMMI)** in 2010. **National Mission for Sustainable Agriculture (NMSA)** was formed in the year 2014-15 and micro irrigation was considered as on-farm water management component of NMSA .

Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)

- PMKSY has been launched with the motto of providing Har Khet Ko Paani. The main objective of PMKSY is to achieve convergence of investments in irrigation sector at field level.
- A **Micro Irrigation Fund (MIF)** with an initial corpus of Rs. 5000 crore was allocated in the union budget 2017-18. This budget is to help the States to mobilize additional resources for increasing the coverage under Micro irrigation through special and innovative initiatives by state Governments.

Impact of Micro Irrigation

- Micro irrigation methods *reduce conveyance losses, evaporation runoff deep percolation losses.*
- Another advantage of this technology is that it will be functional with small water wells also. Due to focused water application, the **overall efficiency of water in drip irrigation and sprinkler irrigation are 80-90 per cent and 50-70 per cent respectively.** This is much higher than that of **surface flooding (30-40 per cent).**
- Micro irrigation is suitable for any farmable land slopes and generally for all kind of soils. It is widely used for vegetables and horticultural crops. It has many advantages if managed properly : (i) High water application efficiency (ii) Easily implement even if the fields are irregular shapes (iii) Uniform application of fertilizers (iv) reduction in weed growth and cost of cultivation (v) reduction in energy consumption and (vi) Operational at low pressures.

Conclusion:

Micro irrigation is a proven water conservation technology practiced all over the world. Economic return is very important for the adoption of any new technology. Micro irrigation technologies qualify this aspect and is highly recommended.

NON-FARM-ACTIVITIES TO ACCELERATE AGRICULTURE GROWTH

Need For Development of Non-Farm Activities:

- India agriculture is characterized with the presence of excess manpower in the form of large scale **under-employment, disguised unemployment as well as high seasonal unemployment.**
- The sector wise trends in the growth of real Gross Value Added (GVA) reveal that last decade, primary sector witnessed a meager growth rate as compared to secondary and tertiary sectors.
- This has led to wide inter- sectoral, inter-regional and inter- personal variations in the distribution of income and wealth.
- The NSSO survey on Household consumption expenditure for the year 2011- 12 also brings into light that more than one fifth (22.4per cent) of rural households with agriculture as their principal occupation were having income below poverty line.
- Not only had this, farmers' income in relation to non- farm works, also stood very low. In 2011-12 income per farmer was just 32 percent of the income of non-agriculture worker.

- Realizing the need to boost income of rural households, the GOI the union budget 2016-17 had announced its resolution to double the farmers' income by the year 2022.
- For this, it is imperative to give impetus to farm as well as non – farm activities. It is necessary to adopt modern integrated farming with large involvement in the ancillary activities like animal husbandry, horticulture & forestry, vegetable growing bee keeping, sericulture poultry etc.

Food Processing

- Processing of agricultural produce is an important aspect of commercialization of agriculture in India.
- Presently, processing of fruits and vegetables is only 2 percent in India in comparison to 80 per cent in USA, 40 per cent in China.
- There are vast opportunities to the rural entrepreneurs in the field of food processing. The most important point in food processing is that a sizeable portion of raw material being local and rural based is comparatively cheap and fresh.
- It has a very high employment potential with significantly low investment.

Conclusion:

- To attract unemployed educated youth into agribusiness and agri-preneurship special impetus on creating scientific temper and fostering innovative spirit among the rural youth is required.
- Also, appropriate policy coupled with a strong strategy to promote and strengthen the rural non-farm sector deserves to be at the top priority of Government and Policy makers.