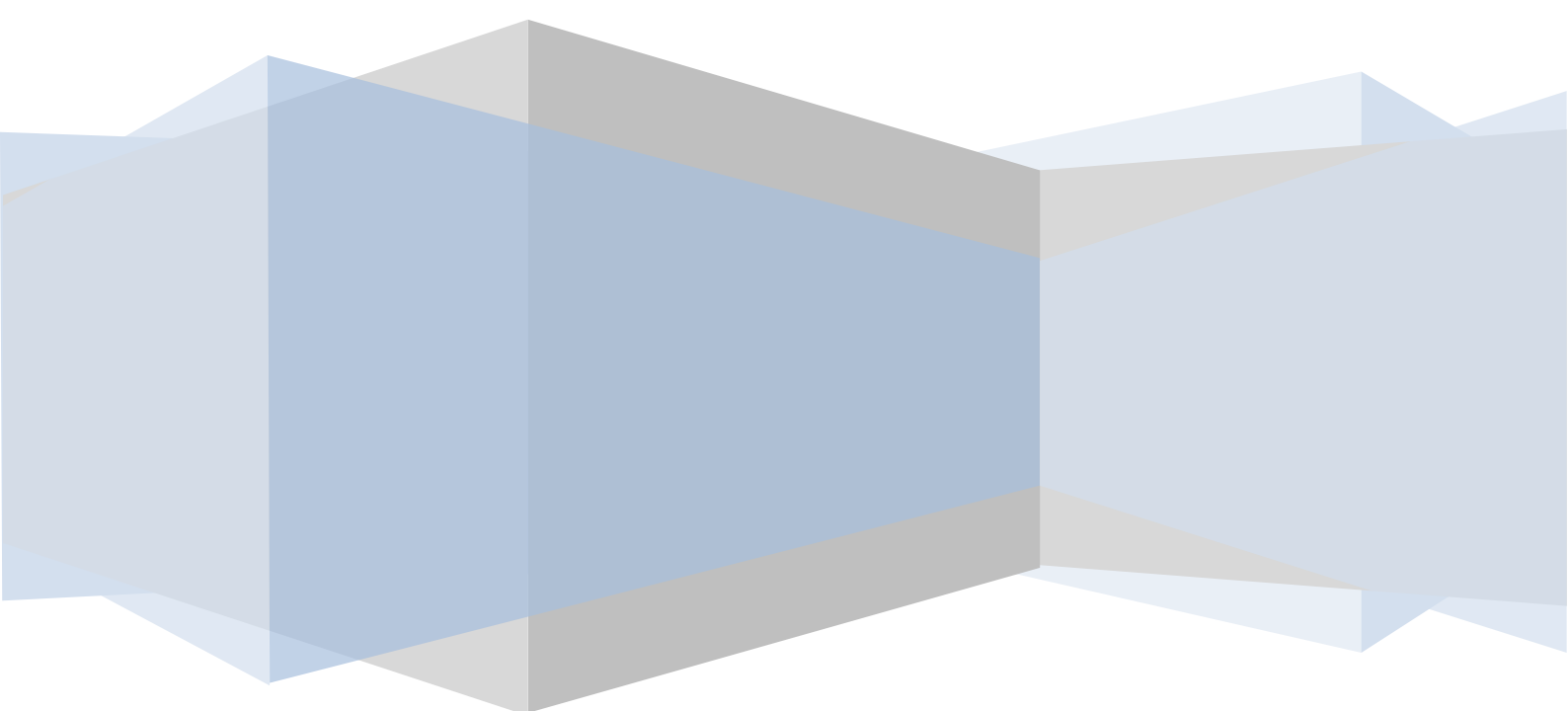


# Chapter 2: Agriculture Inputs

## Short Answers

### CSM 05: Agriculture

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**This chapter contains:**

- Doubling of Farmers' Income
- Agricultural Inputs - Labour
- Agricultural Inputs – Land
- Fertiliser Policy and Direct Benefit Transfer
- Agricultural Inputs- Fertilizers
- Agricultural Inputs- Irrigation
- Agricultural Inputs- Credit
- Agricultural Subsidies
- Public Distribution System
- Income support to farmers
- Introduction to Agriculture

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## 1. Doubling of Farmers' Income

The Doubling Farmers' Income (DFI) Committee recognises agriculture as a value led enterprise and suggests empowering farmers with "improved market linkages" and enabling "self-sustainable models" as the basis for continued income growth for farmers. This builds the basic strategy direction for four primary concerns: optimal monetisation of farmers' produce, sustainability of production, improved resource use efficiency and re-strengthening of extension and knowledge based services.

The Committee identifies and focuses on seven major sources of growth (Volume II), operating within and outside the agriculture sector. These are,

- Improvement in crop productivity.
- Improvement in livestock productivity.
- Resource use efficiency or saving in cost of production.
- Increase in cropping intensity.
- Diversification towards high value crops.
- Improvement in real prices received by farmers.
- Shift from farm to non-farm occupations.

The DFI Committee tables the "growth targets" for doubling farmer's real income while improving the ratio between farm and non-farm income from 60:40 as of now, to 70:30 by 2022.

Ensuring food security by increasing agriculture output has been the cornerstone of agricultural development policy in India. This policy objective has been broadly accomplished. Implicit in the strategy was an underlying assumption that benefits of increased production and productivity would have a trickle-down effect on farmers' welfare in terms of their income levels. However, the policy intent has not been fully realized and the farmers' incomes have not risen as expected.

India can ill-afford to continue with tonnage-centric agri-policy i.e. emphasis on increasing production which may not necessarily increase total income of farmers. The disparities in income levels between agriculture and non-agriculture sectors are huge. The **Hon'ble Prime Minister of India made a statement on 28 February 2015 at Bareilly on Doubling Farmers' Income by the year 2022**". Accordingly, we need to Shift from Green Revolution to Income Revolution for farmers. This is doable if we focus on six broad measures. These are:

1. **Creating an enabling policy framework**
2. **Intensification of farming, diversification to high value agriculture**
3. **Reforms in Agri-Marketing and agri-logistics**
4. **Stable Agricultural trade policy**
5. **Transfer of Technology : Labs to Land**
6. **Agriculture Insurance to cover risks**

Let me now elaborate each of these measures.

## 1.1 Creating an enabling policy framework

Under this, following measures are recommended:

- i. Land is inelastic, yet activities can add income elasticity. For instance, enable farmers to be producer of solar energy (*urjadata*) and let them play a significant role in the country's ambition to be one of the frontrunners in the International Solar Alliance for clean energy.
- ii. There is need to encourage the right and optimal kind of **rural industrialisation that captures more value from the produce and generates jobs** through near-farm or on-farm activities.
- iii. The cost of labour (i.e. wage rates) is going to outstrip the cost of capital in near future and therefore human labour is going to be an issue. The solution lies in promoting farm mechanization, Custom Hiring Centres 'on peruse basis' like '**Uberisation**'
- iv. 'Skilling' of agri-labour to enable them to command higher wages and nudge them to move to other sectors of the economy which will help augmenting their income levels.
- v. Primary value addition can be encouraged at village level on a cottage scale.
- vi. Inherent policy biases in the existing policy framework need to be addressed to make it more balanced.
- vii. ensure conservation of scarce resources like water and electricity and achieve 'per drop-more crop'
- viii. Help farmers to move towards green and sustainable agricultural practices.

## 1.2. Intensification of farming, diversification to high value agriculture

- i. Empirics have shown that emphasis on increasing production and productivity may not necessarily augment farmers' welfare and their total income. Land, the principle asset of the farmer has direct bearing on the production and associated income to individual farmers.
- ii. The average size of operational holdings ebbed from 1.84 hectare in 1980-81 to 1.08 hectare in 2015-16 and this trend is likely to continue in the near future. The dominance of marginal and small farm holdings in India has increased considerably by 10 percentage points to 85.0 percent during the corresponding period.
- iii. It is important to have a hard look at **crop geometry** to capture more value from available land. Land is an important factor of production and needs to be used more judiciously. Rice, wheat and corn together command 42% of land under crop cultivation and account for 19% of the value whereas horticulture occupies 12% of land and gives 24% of value. Therefore, there is a case to release surplus land under cereals for high value commodities.
- iv. Against this backdrop, we need to enhance farmers' income through appropriate intensification and diversification strategies. The focus is to be laid on ways in which the farmers' incomes can be increased through allied activities like dairy, poultry, fisheries and food processing.

- v. The critical inter-linkages between size of holdings, propensity to adopt technology, credit, farm mechanisation, diversification to high value crops and income levels be established.

### 1.3. Reforms in Agri-Marketing and agri-logistics

Agriculture production should move from '**plate to plough**', implying that production decision should be demand driven. Crops should be cultivated based on the food habits of people and those which are highly demanded, rather than being independent of demand. It should emit signals to farmers as to **what to produce, how to produce and for whom to produce**. This calls for a policy indulgence to nudge farmers not to cultivate the same crops *en masse*, else it leads to the '**Cobweb Syndrome**' which follows a particular pattern. Let me briefly touch upon this syndrome:

- i. When price of a commodity surge, farmers produce more of that crop next season and price falls down due to excessive supply.
- ii. Farmers change crop, the supply reduces next season, and the seesaw cycle repeats.
- iii. The price signal is **ex-post** (after sales), and the farmer's reaction is **ex-post facto** (after the fact has relevance).
- iv. For the farmers, the temporal increase in price of a crop is a false signal to sow more of that particular crop in the next season.
- v. This lag effect between price signal and sowing patterns is an acute failure of the marketing system.
- vi. This fluctuation is a result of unguided, action and reaction.
- vii. As a result, future growth is stunted, while price and supply balance to reach a steady state.

**Therefore, Marketing system is to be made efficient by** providing a price signal that is **ex-ante**. Under this policy, farmers should be enabled to cultivate crops according to demand, as per experts' findings, to make agriculture profitable. For instance, palm oil cultivation in coastal areas be promoted as India is deficient and imports large quantities of this commodity. India can consider designing 'One village one competitive product' (OVOP) as a business to gain sales revenue. Such a model is in vogue in countries like Japan, Thailand.

Due to gaps in the storage and marketing infrastructure, poor handling practices, lack of proper storage infrastructure and absence of post-harvest protocols, the country suffers huge post-harvest losses. Therefore, reforms are needed in storage and agri-logistics including integrated cold chain, warehousing and food processing;

### 1.4. Stable Agricultural trade policy

- i. Trade Policy for agriculture should aim to facilitate and promote ease of doing business, rather than be restrictive and disruptive to business planning. Trade regime, export promotion and credit policies that affect agricultural trade including export and import of agricultural produce, have tended to have an inadequate focus on the interest of farmers.

- ii. A cogent agricultural trade policy ought to be rooted in the long term<sup>1</sup> food and nutritional security concerns of the country alongwith promoting farmers connection with the global markets.
- iii. However, the instrument of international agri-trade is often used to control prices in the domestic market, in reaction to short term supply bottlenecks. This tends to negatively impact farmers' incomes.
- iv. We need to focus on putting in place a neat, and cogent blueprint of agri-export policy to avoid abrupt restrictions on exports of agri-commodities
- v. Since short term view of trade policy compounds the existing risks and uncertainties for farmers, a stable trade regime be designed to maintain a long term view to help farmers build market relationships at the global level.

### **1.5. Transfer of Technology: Labs to Land**

- i. The linkage between the research in our labs and its use by the farmers needs considerable strengthening. While a section of farmers is forward looking and takes advantage of various support services such as soil health cards, kisan credit cards, soil testing labs and kisan call centres, not all of them do so.
- ii. Development of suitable extension programmes is inevitable to improve farmers' incomes. Agricultural Universities should guide farmers on 'what', 'when' and 'how' of farming, depending upon local conditions.
- iii. Additionally, integrated farming system models for small-holders in different agro-climatic conditions needs to be popularized through Krishi Vigyan Kendras (KVKs) and State agricultural universities on a massive scale. Emerging technologies, AI, IOT and Blockchain are adopted under the agriculture sector.

### **1.6. Agriculture insurance**

- i. Agriculture is like an industry under open sky where the vagaries of the weather leave the farmers vulnerable and affect their incomes. Along with the perils of natural calamities such as floods and droughts, global warming and climate change are additional challenges being faced by the agriculture sector.
- ii. The extreme heat waves and lowered water tables compounds the vulnerability. While the launching of the flagship insurance scheme, PMFBY is a step in the right direction, the low insurance coverage due to a variety of reasons such as affordability of premium, delay in settlement of insurance claims to farmers is a cause of concern and signals the necessity of appropriate changes.

To recapitulate, When agriculture policy framework is reoriented alongwith other measures as outlined, it will lead to higher levels of income of farmers through monetisation of their high value produce, better price realisation, congenial trade policy environment and covering

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<sup>1</sup> A long term usually takes 3 years view as in case of Foreign Trade Policy announced by the Department of Commerce

farmers against risk. Doubling of farmer's income is a dream envisioned with eyes wide open and it will be surely accomplished.

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## 2. Agricultural Inputs - Labour

### 2.1. Labour

As per the Agriculture Labour Enquiry Committee, agricultural laborers are those who derive their major income by working on the farms of others for a wage. An agricultural labourer has no right of lease or contract and has no risk in the cultivation of land. He merely works on another person's land for a wage.

The agricultural laborers are: (i) engaged in agricultural or allied activities, (ii) work for a wage in cash or kind, (iii) work full time or part-time, whole year or part of a year.

### 2.2. Problems faced by agricultural labour in India are:

**Marginalization of agricultural workers:** While the share of agriculture and allied activities in our country's GDP at factor cost has been constantly decreasing from 55.3% in 1950-51 to 14.0% in 2011-12 (at 2004-05 prices), the workforce in agriculture has increased from 97.2 million in 1951 to around 228 million in 2011-12. This in turn has led to the problem of disguised unemployment as the number of workers engaged in agriculture is far more than what is required.

**Labour productivity:** The number of workers engaged in agriculture is far more than what is required because industrial growth has been insignificant compared to the population growth and has been unable to absorb the surplus labour. This has led to the problem of **disguised unemployment** and labour productivity has declined. In India, the labor productivity growth rate for the agriculture and allied sector in the fiscal year 2019 was found to be 6% which was the least productive year compared to the last six fiscal years.

**Wages and Income:** Agricultural wages and family incomes are very low in India.

**Employment and Working Conditions:** Agricultural workers have to face problems like unemployment and underemployment. Due to the seasonal nature of agriculture, for a major part of the year, agricultural workers have to remain unemployed as there is no work on the farms and alternative sources of employment are not present.

**Indebtedness:** Due to the paucity of institutional loans in the rural areas, farmers have to rely on the local moneylenders who often lend money at exorbitant interest rates. This pushes farmers into the vicious cycle of debt. Indebtedness has become a major reason for the recent rise in farmer suicides.

**Low wages for women workers employed in agriculture:** Female workers are generally forced to work harder in the fields and are paid less than their male counterparts.

**Menace of child labor:** The incidence of child labor is very high in the agriculture sector as not only are they easily available but can also be employed at low wages.

### 2.3. Feminization of agriculture

Feminization of agriculture refers to the increasing number of female workers in the agriculture sector. **Economic survey 2017-18** says that with growing rural to urban migration by men, there is 'feminization' of the agriculture sector, with an increasing number of women in multiple roles as cultivators, entrepreneurs and laborers.

As per the Food and Agricultural Organization (FAO), women's contribution to Indian agriculture is about 32%. According to Census 2011, out of the total female main workers, 55% were agricultural laborers and 24% were cultivators.

There are several **positive impacts of feminization of agriculture** like:

1. As per FAO, if women had the same access to productive resources as men, they could increase yields on their farms by 20-30%.
2. Research worldwide suggests that women with access to secure land, formal credit, and access to market have a greater propensity in making investments in improving harvest, increasing productivity, and improving household food security and nutrition.
3. Women can propel the country towards second Green Revolution, and they can change the landscape of development if they get opportunities and facilities.
4. As per Oxfam India, women are responsible for 60-80% of food and 90% of dairy production, respectively.

### 2.4. Challenges faced by women in agriculture:

1. As per Census 2011, only 12.8% of the operational landholdings were owned by women, which reflect gender disparity in ownership of landholdings in agriculture.
2. Lack of ownership of land does not allow women farmers to approach banks for institutional loans as banks usually consider land as collateral.
3. Work by women farmers, in crop cultivation, livestock management or at home, often goes unnoticed.
4. Female farmers are generally excluded from **modern contract-farming arrangements** because they lack secure control over land, family labor, and other resources to guarantee delivery of a reliable flow of produce.
5. With the ongoing innovation in agriculture and the introduction of new technology to automate specific manual labor, women may lose their jobs because they are often responsible for the manual duties.
6. Women farmers in India often face gender discrimination.
7. Lack of skills and insufficient training of women farmers hampers their productivity.
8. Women farmers are poorly represented in the society as well as farmer organizations.

9. When compared to men, women generally have less access to resources and modern inputs (seeds, fertilizers) to make farming more productive.

#### **2.5. Government measures to encourage women's role in agriculture:**

1. The government is earmarking at least 30% of the budget allocation for women beneficiaries in all ongoing schemes and development activities.
2. The government is also giving preference to women under various policies such as organic farming, self-employment scheme, Pradhan Mantri Kaushal Vikas Yojana, etc.
3. 15th October of every year has been declared as Women Farmer's Day.
4. Provisions of issuing Kisan Credit Card to women have been made.
5. The focus is on connecting women self-help groups (SHGs) to micro-credit through capacity-building activities and to provide information and ensuring their representation in different decision-making bodies.

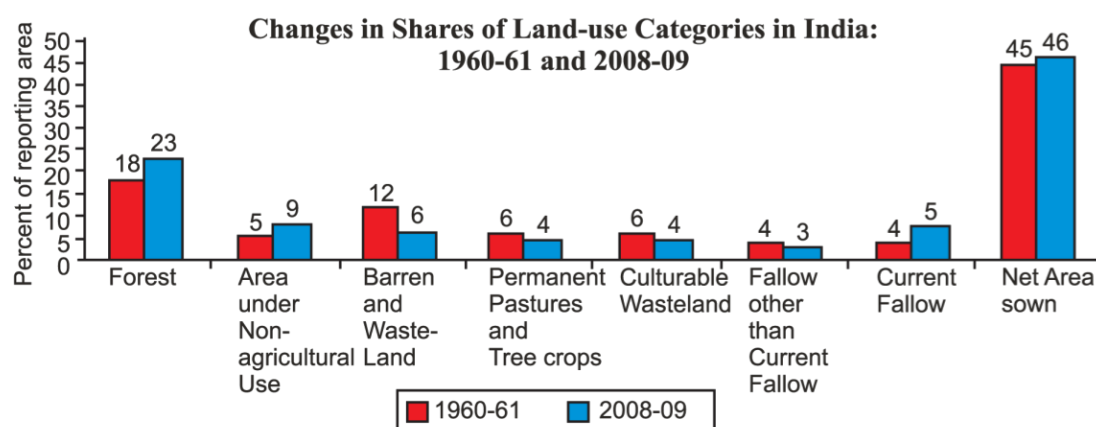
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### 3. Agricultural Inputs – Land

Agriculture is pure land-based activity. The quality and size of land have a direct bearing on the productivity of agriculture. Aside from its value as a productive factor, land ownership also has a social value and serves as a security for credit, natural hazards, or life contingencies, and also adds to the social status. Thus, lack of access to land is directly correlated with the incidence of poverty in rural areas.

#### 3.1. Land use in India

Land revenue records mention different land-use categories- forests, land put to non-agricultural uses, barren and wastelands, area under permanent pastures and grazing lands, area under miscellaneous tree crops and groves (not included in net sown area), culturable wasteland, current fallow, fallow other than current fallow and net sown area.



#### 3.2. National land records modernization programme (NLRMP-2008)

The National Land Records Modernization Programme (NLRMP), launched by the Department of Land Resources under Rural Development Ministry in August 2008, aimed to modernize management of land records, minimize scope of land/property disputes, keep track of land ceilings, enhance transparency in the land records maintenance system and facilitate moving eventually towards guaranteed conclusive titles to immovable properties in the country.

#### 3.3. Major Components of the NLRMP Programme includes:

1. Computerization of all land records.
2. Digitization of maps and integration of textual and spatial data.

3. Survey/re-survey and updation of all survey and settlement records including creation of original cadastral records wherever necessary.
4. Computerization of registration and its integration with the land records maintenance system.
5. Development of core Geospatial Information System (GIS) and capacity building.

### 3.4. Model Agriculture Land Leasing Act, 2016

NITI Aayog came up with the act having the following main features:

1. Legalize land leasing to promote agricultural efficiency, equity and power reduction. This will also help in the much needed productivity improvement in agriculture as well as occupational mobility of the people and rapid rural change.
2. This is very important step for land reforms through which needs of landlord as well as lease holder have been taken care.
3. Through this Act, the landlord can legally lease the land with mutual consent for agriculture and allied activities. In this Act, it has been taken care that in any circumstances, the leased holders' claim on land will not be valid.
4. Lease holder can receive institutional loan, insurance and disaster relief so that he may invest more and more in agriculture.
5. It allows automatic resumption of land after the agreed lease period without requiring any minimum area of land to be left with the tenant even after the termination of tenancy, as laws of some states require.
6. It incentivise tenants to make investments in land improvement and also entitle them to get back the unused value of investment at the time of termination of tenancy.
7. In order to resolve the dispute between the landlord and lease holder, the provision of "Special Land Tribunal" has been made in the civil court.

### 3.5. Agricultural Inputs – Seeds

The Seeds Act, 1966 provides for the legislative framework for regulation of quality seeds sold in the country. In order to encourage the exports of seeds in the interests of farmers, the procedure for export of seeds have been simplified. Seeds of various crops have been placed under **Open General License (OGL)** except the seeds of wild varieties, germ plasms, breeder seeds and onion seeds which are in restricted list under the Export and Import Policy 2002-07.

Agricultural yield (amount of crop produced in a given acre of land) depends greatly on seed quality. For best yield, hybrid seeds must be replaced every year, and non-hybrid must be replaced every three years. However, **seed replacement in India is less than optimum.**

Therefore, in order to encourage the seed sector, government has approved **100% FDI in seed development.** Other measures which can be taken to promote the seed sector include

steps like strengthening the regulatory mechanism, providing intellectual property rights (IPR) protection to new research and development in this sector, establishing a robust third-party quality certification system for seeds and incentivising private sector in the form of bankable schemes.

### **3.6. National seed policy, 2002**

National Seed Policy, 2002 was launched to provide intellectual property protection to new varieties, usher this sector into planned development, protect the interests of farmers and encourage conservation of agro biodiversity.

The policy had **following thrust areas**:

1. Varietal development and plant varieties protection
2. Seed production
3. Quality assurance
4. Seed distribution and marketing
5. Infrastructure facilities
6. Transgenic plant varieties
7. Import of seeds and planting materials
8. Export of seeds
9. Protection of domestic seeds

### **3.7. Draft seed bill, 2019**

**Key provisions of the draft seed bill are as follows:**

1. It provides for the formation of **Seed Committee** that will be responsible for the effective implementation of its provisions.
2. All varieties of seeds for sale have to be registered and are required to meet certain prescribed minimum standards.
3. **Licensing norms** have been revised. Now, there will be a differentiation between the seed producer, seed processor and seed dealer for the purpose of licensing.
4. Currently, a large percentage of seed is sold under a self-certification programme called "Truthfully Labelled (TL)" seeds. The **certification process has been kept voluntary**.
5. The bill empowers government to **fix the prices of selected varieties** in case of 'emergent' situations like seed shortage, monopolistic pricing, profiteering etc.

### **3.8. Protection of plant varieties and farmers' rights (PPV&FR) ACT, 2001**

The aim of the act is the establishment of an effective system for the protection of plant varieties, the rights of farmers and plant breeders and to encourage the development of new varieties of plants.

The act establishes **Protection of Plant Varieties and Farmers' Rights Authority under the Ministry of Agriculture and Farmers Welfare**. It also establishes **Plant Varieties Protection Appellate Tribunal (PVPAT)** which shall dispose of the appeal within one year and whose decisions can be challenged in the High Court.

**Rights under the PPV&FR Act** are as follows:

1. **Breeders' rights:** Breeders (seed producers) will have exclusive right to produce, sell, market, distribute, import or export the protected variety.
2. **Researchers' rights:** Researcher can use any of the registered variety under the act for conducting an experiment or research. However, repeated use needs prior permission of the registered breeder.
3. **Farmers' rights:** A farmer can save, use, sow, re-sow, exchange, share or sell his farm produce including seed of a variety protected under the PPV&FR Act, 2001. However, the farmer shall not be entitled to sell branded seed of a variety protected under the PPV&FR Act, 2001. There is also a provision for compensation to the farmers for non-performance of variety. The farmer

### **3.9. Seed bank/seed vault**

The core objective of a seed bank is to make available seeds for contingent situations, develop infrastructure for seed storage and to preserve the genetic diversity.

### **3.10. Seed Village**

As per the Seed Policy 2002, '**The Seed Village Scheme**' will be promoted to facilitate production and timely availability of seeds of desired crops/varieties at the local level. Groups of farmers in a village are given training to produce seeds of various crops so that they can fulfil seed demand of their own and neighbouring villages.

### **3.11. Green revolution and seeds**

Green Revolution refers to large increase in food production with the help of **High Yielding Varieties (HYV) of hybrid seeds**. MS Swaminathan was the man behind the revolution. It strengthened agricultural research and technology that helped to increase agricultural productivity in the developing nations.

The first phase of the Green Revolution was started in mid-1960 and ended in the mid-1970. Two semi- dwarf wheat varieties of Mexican origin, were released for cultivation in irrigated areas. These varieties resulted in high yields and brought about a wheat revolution in India.

In this time phase, the application of HYV seeds were limited to states like Punjab, Tamil Nadu, Andhra Pradesh etc. and mainly benefitted wheat production. The second phase of the Green Revolution was started in 1970 and ended in 1980. The HYV seeds got a nationwide extension and most of the crops were benefitted.

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#### 4. Fertiliser Policy and Direct Benefit Transfer (DBT)

Fertilizers are crucial productivity augmenting inputs. To meet the challenge of rising demands of food, feed and fibre with limited land and water resources, it is imperative to augment land productivity and one way to do this is to make fertilisers easily accessible to farmers.

With this end in view, fertiliser sector in the country is subsidised. Foodgrains production has increased to more than comfortable level. And much of this increase came in the post-green revolution period when high-yielding variety seeds (HYV seeds), along with irrigation and fertiliser usage, picked up pace. Chemical fertilisers have played an important role in increasing grain production.

Keeping in mind the importance of agriculture in any sizable country to feed its people, the form of subsidisation has often varied, with most developed countries having moved from **price support to income support** (with the notable exception of Japan and South Korea). However, India extends support to agriculture primarily through price policy, be it for output or inputs.

It is in this context that one should see fertiliser pricing and subsidy issues in India. The fertiliser subsidy is one of three 'big ticket' items in the basket of total subsidies in the country. It commands over one-fourth of total subsidies in 2020-21.

Crops require right mix of three fertilisers *viz.* nitrogen, phosphorus, and potassium or NPK.

- i. **Nitrogen or simply Urea** : helps in plant growth and development,
- ii. **Phosphorus or P** : accelerates blooming and also helps plants to withstand stress; and
- iii. **potassium** or K helps the process of photo synthesis and is essential to plant growth.

The functions of these nutrients are complementary and do not substitute one another. Balanced fertilisation of soil would mean application of all of these nutrients in the soil in the correct proportion, using appropriate methods and in a timely fashion so that the soil remains healthy and fertile to ensure increasing grain production on a sustainable basis.

The requirement of three different nutrients varies from crop to crop, soil to soil. An all-India recommended doses of N:P:K is in the ratio of 4:2:1, on an average. That means if 10 kgs of **potassium is required to be used in a certain crop in a given piece of holding**, 20 kgs of Phosphorus **and 40 kgs of urea is to be applied. However, ground reality show that over 60 kgs of urea as against the requirement of 40 kgs is applied.** Clearly, consumption ratio has been highly skewed in favour of urea.

Imbalanced use of N, P and K has led to loss of fertility in the soil over a period of time, which affects efficiency of fertilizer use and crop productivity.

**A question arises as Why has skewedness in application of fertiliser crept in?** To deepen the understanding of this, let us have a look at pricing policy of fertilisers.

Urea, the only controlled fertilizer, is sold at statutory notified uniform sale price and decontrolled Phosphatic and Potassic fertilizers are sold at an indicative maximum retail prices (MRPs).

While the prices of urea are fixed and subsidies levels float, it is the other way round in case of P and K. The current price of urea at Rs.5360/tonne, just as an example, is low due to subsidy in relation to about 3 to 5 times that of other two nutrients.

Favourable pricing policy of urea in comparison to those of other two nutrients has driven farmers to overuse urea. Thus, pricing policy impinges on balanced use of fertilisers.

Of late, consumption ratio of urea in relation to other two nutrients has ebbed somewhat. It may also be noted that measures like neem coating of urea has reduced its diversion to non-agriculture purposes which makes it appear as if its actual consumption of this fertiliser in the agriculture sector has declined.

In any case, over use of urea has double whammy and needs to be fixed on priority. First, it extracts higher than necessary domestic resource costs (DRCs) in production of urea in excess of 'real' demand and secondly it damages soil which impinges on productivity.

**A more fundamental question arises as to why fertiliser subsidy was introduced in the first place?**

In the backdrop of food scarcity in the country, price concession on inputs such as fertilizer was offered to increase their adoption and thereby augmentation of production

Food security vision of India was driving the agriculture sector

High yielding variety (HYV) needed intensive use of inputs like water & fertilizers;

To promote use of fertilisers, its prices were subsidised

Since the agricultural markets were not efficient enough to discover remunerative prices of the output, they had to be offered price support in the form of procurements at MSP This chain comprising several links came to be built on heavy subsidies at each stage.

It turned out to be a typical case of acquiring a cat to keep off the rat, which then necessitated acquisition of a cow to produce milk for the cat reared at home and so on.

Due to subsidised prices of urea in India, there have been cases of its smuggling to neighbouring countries and diversion to industrial use, besides other mis-uses of subsidies.

To improve efficiency and cost effectiveness of the subsidy, the Government of India has introduced DBT system for fertilizer subsidy payments under which 100% subsidy on various fertilizer grades is released to the fertilizer companies on the basis of actual sales made by the retailers to the beneficiaries.

#### **Let us have a look at Current form of DBT**

Sale of all subsidised fertilizers to farmers is now made through Point of Sale (PoS) devices installed at each retailer shop. Aadhaar enabled Fertilizer Distribution system (AeFDS) has been introduced. The farmers will continue to purchase Urea at statutory subsidised prices, as earlier.

the fertiliser companies which used to receive subsidy on receipt of fertilisers at the district level, now get subsidy after sale to farmers by the retailers through PoS machines upon biometric authentication. The point of sale (PoS) devices have been installed at each retailer shop.

This DBT approach enables to track movement at the lowest formation of the administrative set up and ensures availability of fertilises to farmers.

However, this version of DBT does not help much in terms of balanced use of various types of fertilisers nor does it empowers farmers with the FoC.

#### **What is the Way Ahead?**

Cash transfer directly (DBT) to the farmer in lieu of fertilizers at subsidised prices will benefit them as they would be empowered to choose the fertilizer combination best suited to their soil texture without the influence of the distorted price relatives of NPK.

This will also give farmers the freedom of choice to produce any crop that do not require urea. Currently, the extant instrument of pricing policy of subsidies nudge farmers to produce more of crops like wheat and rice which require use of urea. In contrast, Farmers are disinclined to produce more of pulses, just as an example, as this crop require fertilisers other than urea which are relatively expensive. Consequently, production-mix continue to remain out of sync with demand. This entails its own opportunity cost.

The solution lies in freeing up subsidising fertiliser as an input and give cash directly to farmers on per hectare basis in lieu of this subsidy.

A pre-requisite for real DBT is **Digitisation of land records**. Without setting the land records right, it will not be possible to transfer the subsidy to beneficiaries. Though the process of digitisation of land records was launched in August 2008 but has not gathered momentum in many states. This calls for states' to take up the issue immediately.

According to an estimate made by this Professor, if cash amount @ Rs. 5250/hectare is transferred in lieu of fertilizers subsidy to semi-medium farmers (middle group) and to others in a graded system, higher amount to farmers with smaller holdings and lesser to large farmers, it would not lead to any additional net outgo from the exchequer, over and above the current level of fertilisers subsidies is extended.

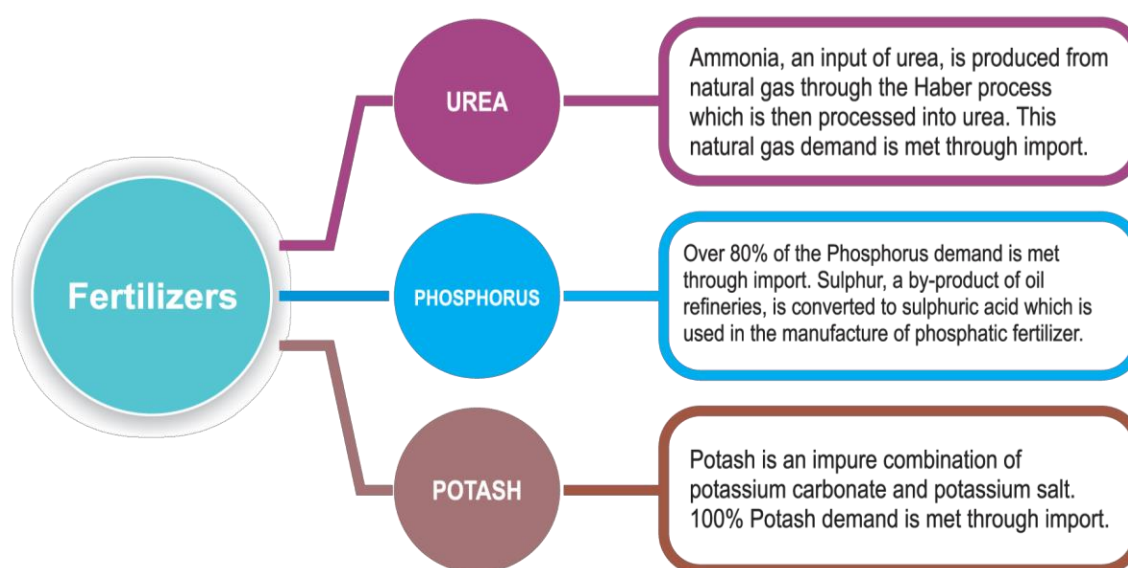
The proposed DBT would empower farmers to choose the fertilizer combination best suited to crop they choose to grow, the soil texture without the influence of the distorted price relatives of NPK.

It will be a 'win win' situation if the Government walks the last mile in fully implementing DBT in case of fertilizers subsidy.

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## 5. Agricultural Inputs – Fertilizers

Fertilizers can be classified into three categories namely- **Primary, Secondary and Micronutrients**. Primary fertilizers are further classified into nitrogenous (urea), phosphatic (di-ammonium phosphate (DAP)) and potassic (muriate of potash (MOP)) fertilizers. Secondary fertilizers include calcium, magnesium and sulphur while micronutrients include iron, zinc etc.



### 5.1. Indian Fertilizer Industry

1. India is the second largest consumer of urea fertilizers after China and also ranks second in the production of nitrogenous fertilizers.
2. Fertilizer industry is one of the eight core industries.
3. Fertilizer subsidy burden remains high, and India spent nearly Rs 80,000 crore on fertilizer subsidy in 2018.
4. In India, the NPK ratio stands at 6.7:2.4:1 as against an ideal ratio of 4:2:1, showing a skewed trend towards urea consumption.

### 5.2. General issues with the fertilizer sector in India

1. Fertilizer consumption in India is **highly skewed towards urea** due to growing price difference between urea and other fertilizers.
2. **Overuse of fertilizer** has negative impact on the environment. For e.g., excessive use of nitrogenous fertilizers can increase the acidity of the soil and leaching of nitrate into the ground water can also take place.

3. **Urea import is canalised**, meaning that the importers of urea needs to channelize it through the public sector. This causes inefficiencies like delays in imports which leads to unavailability of fertilizers around planting seasons when the need is most crucial.
4. **Black marketing** of urea is rampant, which puts small farmers at a disadvantage due to higher costs.
5. Urea subsidy also suffers from **leakages** and around 36% of the subsidy is lost through leakage to the industry or smuggled across borders.
6. **Delays in subsidy release** puts strain on the fertilizer companies and makes them unsustainable.
7. The fertilizer sector suffers from **over-regulation**. As the government controls the price of urea, fertilizer companies have no incentive to lower the cost of production, thus leading to production inefficiency.

### 5.3. Nutrient Based Subsidy (NBS)

NBS is a Central Sector Scheme started by **Ministry of Chemical and Fertilizers** in 2010. Under the scheme, subsidy is given to fertilizer company based on the weight of different nutrients (Nitrogen, Phosphorus, Potassium and Potash) contained in the fertilizer. Apart from this, fertilizers fortified with secondary and micronutrients are given additional subsidy.

NBS scheme is used to determine the Phosphorus and Potassium (P&K) subsidy, which in turn is based on factors like exchange rate, international and domestic prices of P&K fertilizers, inventory level etc. It is to be noted that **Urea has been kept out of the NBS scheme** and a separate Urea subsidy is provided by the government.

NBS scheme was brought in to increase the consumption of P&K fertilizers and check the overuse of urea, thus ensuring balanced fertilization. The scheme was also aimed at increasing the agricultural productivity, supporting indigenous fertilizer industry and reducing the fertilizer subsidy burden.

#### UREA SUBSIDY

Urea subsidy is a Central Sector Scheme of the **Department of Fertilizers**. The **New Urea Policy-2015 (NUP-2015)** has been notified by the Department of Fertilizers, extended till 2019-20, with the objective of maximizing indigenous urea production, promoting energy efficiency in urea production and rationalizing subsidy burden on the government. It is applicable to the existing 25 gas based units.

Urea is the **only controlled fertilizer** and is sold at statutorily notified sale price. On the other hand, P&K fertilizers are decontrolled and is sold at indicative MRPs.

#### NEEM COATED UREA

Ministry of Chemicals and Fertilizers made it mandatory for fertilizer companies to neem coat the urea before selling it. **Neem coated urea provides the following benefits:**

1. Neem coating **slows down the rate of dissolution** of urea in the soil, helping plants gain more nutrients based on their needs. This in turn improves yield of produce.
2. Neem coating also **reduces pest attacks** as neem is a natural insecticide.
3. Neem coating will **prevent diversion of heavily subsidized urea** towards non-agricultural purposes like chemicals industry and other uses such as making adulterated milk.
4. Collection of neem seeds for making neem coated urea will also help **generate employment in rural areas**.

## **SOIL HEALTH CARD**

Soil health card is a Core Scheme launched in 2015 by the Department of Agriculture, Cooperation and Farmers Welfare. The Scheme assists State Governments to issue soil health cards to all farmers in the country. A farmer's land is tested and he is given updated soil health card every two years. The scheme also envisages setting up soil testing labs.

Soil health card provides information to the farmers regarding the nutrient status of their soil. It recommends appropriate dosage of nutrients to be applied for improving soil health and its fertility. The card also advises on which type of crops and irrigation methods will suit his farm depending on his soil health.

### **5.4. Agricultural Inputs – Pesticides**

Pesticides are substances used to control pests. The term pesticide includes all of the following: herbicides, insecticides, fungicides, etc.

India is the fourth largest producer of pesticide in the world but our per hectare pesticide consumption is far less than the developed countries. Pesticides in India are regulated under the Insecticides Act, 1968 and Insecticide Rules, 1971. Around 290 pesticides are registered in India with the Directorate of Plant Protection, Quarantine and Storage which is an attached office under the Agriculture Ministry.

**Insecticides Act, 1968** regulates the import, manufacture, sale, transport, distribution and use of insecticides and pesticides in order to prevent risk to human beings and animals.

A **Central Insecticides Board** was established under Section 4 of the Act and it works under the administrative jurisdiction of the Ministry of Agriculture and Farmers' Welfare. The role of the board is to advise governments on matters related to the administration of the Act.

**Several issues related with pesticide usage** in India:

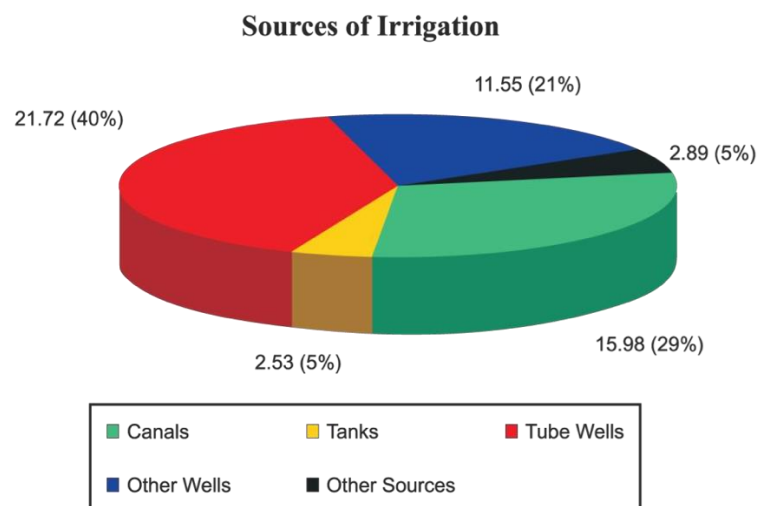
1. Instances of **acute toxicity of farmers** due to pesticides are common. Exposure to pesticides can cause a broad range of nervous system symptoms like headache, fatigue etc.
2. Chronic toxicity of pesticides is a big **health threat for consumers**. Pesticides move up the food chain through the process of biomagnification and ultimately reach humans impacting their health. In 2014, the National Crime Records Bureau (NCRB) recorded 7365 cases of pesticide poisoning, out of which 5915 died.
3. Continuous use of pesticides has negatively impacted the **soil health** and reduced agricultural productivity.
4. While agriculture is a state subject, production, education and research are governed under the Insecticides Act, 1968 which is a central act. This often leads to **regulatory hurdles** and center-state conflict.
5. Other issues include black marketing, rampant illegal usage of banned pesticides etc.

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## 6. Agricultural Inputs – Irrigation

Irrigation is the process of applying water to the crops artificially to fulfill their water requirements. Nutrients may also be provided to the crops through irrigation. The various sources of water for irrigation are wells, ponds, lakes, canals, tube-wells and even dams. There are efficient means of irrigation as well like sprinkler irrigation and drip irrigation.



**Irrigation is important** for agriculture in the following ways:

1. It helps in increasing agricultural productivity and food production which is crucial to meet the food security.
2. It helps counter the spatial and temporal variations in rainfall as well as its uncertainty, irregularity, unreliability and erratic nature.
3. Irrigation maintains moisture in the soil and improves soil health.
4. Irrigation is a must for water intensive crops like sugarcane and jute.
5. Introduction of high yield varieties like Genetically Modified (GM) crops requires high amounts of water which can be supplied through irrigation.

While irrigation is needed to increase agricultural productivity and meet the rising food security needs of the growing population, it is a matter of concern that about 60% of the total cropped area is still dependent on rain. **Irrigation sector in India faces a number of problems** that needs attention like:

1. In most of the irrigation projects, there have been considerable delays in project completion.

2. Irrigation being a state subject, development of water resource is planned individually by states taking into account their own requirements. However, nearly all major rivers are inter-state which often leads to inter-state water disputes.
3. Inadequate on-farm and off-farm infrastructures and poor maintenance leads to poor irrigation efficiency.
4. Regional disparities are also visible in irrigation infrastructure development.
5. Introduction of irrigation has also led to the issue of water logging and salinity in states.
6. Huge investment is required in operating and maintaining irrigation networks, causing financial strain on the governments.
7. Decline in water due to overexploitation of water has affected our irrigation capacity.

Steps taken by the government:

#### **PRADHAN MANTRI KRISHI SINCHAYEE YOJANA (PMKSY)**

PMKSY is a national mission under the Ministry of Agriculture & Farmers' Welfare to improve farm productivity and better utilization of the resources in the country. The scheme has been approved with an outlay of 50,000 crore for the period of 5 years (2015-16 to 2019-20). Major objectives of the scheme are:

1. Convergence of investment in irrigation at field level.
2. Expand cultivable area under irrigation.
3. Improve on-farm water use efficiency to reduce wastage of water.
4. Enhance the adoption of being precise in irrigation and other water saving technologies (more crop per drop).

#### **PRADHAN MANTRI KISAN URJA SURAKSHA EVAM UTTHAAN MAHAABHIYAN (PM KUSUM)**

PM KUSUM scheme has been launched recently by **Ministry of New and Renewable Energy (MNRE)**. The scheme aims to provide energy security along with financial and water security to farmers. It will encourage farmers to generate solar power in their farms. The target is to add decentralized solar power capacity of 25,750 MW by 2022. Components of KUSUM scheme are:

1. **Component A:** 10,000 MW of decentralized ground mounted grid connected renewable power plants.
2. **Component B:** Installation of 2 million standalone solar pumps.
3. **Component C:** Solarization of 1.5 million grid connected solar powered agricultural pumps.

#### **ATAL BHUJAL YOJANA**

Atal Bhujal has been launched by the **Ministry of Jal Shakti**. It is a Central Sector Scheme to improve ground water management through community participation. Seven states are covered under the scheme- Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh. It is being implemented (starting 2020) over a period of 5 years with 50% support from **World Bank**.

To address the challenges, **following irrigation management measures** are required:

1. Building proper infrastructure like canals for adequate and regular water supply.
2. A proper drainage system needs to be put in place for addressing the issue of water logging and salinity in major irrigation commands.
3. Irrigation efficiency needs to be improved through steps like Micro-irrigation.
4. Improving water productivity through steps like: (i) water should be priced at a level enough to motivate farmers to save water, (ii) energy subsidy for pumping water should be abandoned, (iii) biological water-saving measures, engineering solutions, agronomic and soil manipulation should be collectively explored.
5. Water intensive crops should be cultivated in areas with abundant ground water availability. In areas with ground water shortage, drought resistant crops like maize should be grown.

### **Agricultural Inputs – Farm Mechanization**

Farm mechanization refers to the use various power sources and improved farm tools and equipment, with a view to reduce drudgery of the human beings and draught animals, enhance the cropping intensity, precision in metering and placement of inputs and timelines of efficiency of utilization of various crop inputs (seeds, chemical, fertilizer, irrigation, water, etc.) and reduce the losses at different stages of crop production. The end objective of farm mechanization is to enhance the overall productivity and production with the lowest cost of production.

While farm mechanization is an important input to boost agricultural production and productivity, **it is faced with several challenges** like:

1. There is **low overall mechanization** in India compared to countries like USA, China and Brazil. Major reasons being **economies of operation** due to small land holdings, access to power, credit cost and procedures, uninsured markets and low awareness.
2. Small-marginal farmers **lack financial resources** to own or hire farm machinery.
3. Considering India's soil and climatic diversity, customized machinery suited to Indian requirements is needed. However, there is **limited Research & Development (R&D)** in the agriculture mechanization sector.
4. **Regional disparities** are visible with Northern India having higher levels of mechanization compared to other regions.

### **Government initiatives for farm mechanization**

1. **Sub-mission on Agricultural Mechanization:** Sub-mission on agricultural mechanization was launched in April 2014 to promote inclusive growth of farm mechanization to enhance productivity. Under the scheme, individual farmers are provided subsidy for the procurement of farm machinery.
2. **In-situ crop residue management:** Special scheme was created for in-situ management of crop residues in the states of Punjab, Haryana, UP and NCT of Delhi. Machines and equipment for in-situ crop residue management are provided with 50 per cent subsidy to the individual farmers and 80 per cent subsidy for establishment of Custom Hiring Centers.
3. **Agriculture Infrastructure Fund:** Government announced a Rs. 1 lakh crore Agri Infrastructure Fund for farm-gate infrastructure for farmers. Accordingly, Central Sector Scheme of Financing Facility under Agriculture Infrastructure Fund was approved by the Cabinet.

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## 7. Agricultural Inputs – Credit

Timely and adequate availability of finance is a prerequisite for the growth of any sector and agriculture is no exception.

**Agri-finance is an essential component** of agriculture as:

1. Finance is required to invest in agricultural inputs like seeds, fertilizers, machinery etc.
2. Agricultural finance is also needed for agricultural marketing, post-harvest storage and transport of produce, meeting the risks like damage due to pests, diseases and issues like low rainfall etc.
3. Institutional credit prevents farmers from falling into the clutches of money lenders who often lends at exorbitant interest rates and pushes farmers into debt traps.
4. Having money at disposal also provides a sense of psychological relief to the farmers as they are capable of meeting any unforeseen circumstances like crop losses, natural calamities etc.

To ensure timely availability of credit to the farmers, **government has taken the following steps:**

1. RBI's **Priority Sector Lending norms** stipulate 18% lending target for the agriculture sector.
2. **Nationalization of banks** in India has put them under government control and ensured that banks provide lending to the agricultural sector.
3. **Differential banks** like Regional Rural Banks (RRBs) provide lending to the agricultural sector at concessional rates.
4. Government has initiated **Kisan Credit Card (KCC) Scheme** and interest subvention scheme for providing cheap credit to the farmers.
5. NABARD started a pilot project **SHG-Bank Linkage Programme** in 1992 which also involves disbursement of agricultural credit.
6. **Joint Liability Groups (JLG) Scheme** was initiated by NABARD in 2006 to enhance credit flow to share-croppers/tenant farmers who do not have land rights.

### 7.1. Agricultural Inputs – Insurance

India is having one of the largest agriculture dependent population in the world. Since it is a high-risk profession as farmers have to depend on rain and general weather conditions to grow their crops, government needs a prudent agricultural insurance policy to protect the farmers against such uncertainties.

**Need of agricultural insurance** in India:

1. Farmers have traditionally relied on weather conditions to grow their crops. Hence, there is a need to protect them from agriculture variability which often results from uncertain weather conditions.
2. Agricultural crops also witness high price fluctuations, and this necessitates insurance against income failure.

## **7.2. Pradhan Mantri Fasal Bima Yojana (PMFBY)**

**Farmers to be covered:** All farmers growing notified crops in a notified area during the season who have insurable interest in the crop are eligible. To address the demand of farmers, the scheme has been made voluntary for all farmers from Kharif 2020.

### **Risks covered under the scheme:**

1. Local natural calamities like landslides and hailstorms.
2. Calamities leading to loss of yield like floods, dry spell, droughts, etc. Pest infestation is also covered.
3. Post-harvest losses are also covered.

**Units of insurance:** The scheme shall be implemented on an 'Area Approach Basis' i.e., defined areas for each notified crop for widespread calamities with the assumption that all the insured farmers, in a Unit of Insurance, to be defined as "Notified Area" for a crop, face similar risk exposures, incur to a extent, identical cost of production per hectare, earn comparable farm income per hectare, and experience similar extent of crop loss due to the operation of an insured peril, in the notified area.

**Role of states:** States/UTs have been given flexibility to choose their scale of finance for any district crop combination. They have also been given option to run the scheme with the selection of additional risk covers. However, if a state fails to release the requisite premium subsidy to insurance companies on time, they will have to face penalty and will not be allowed to run the scheme in subsequent seasons.

While the government is taking steps to promote agricultural insurance, **the sector still faces many challenges** like:

1. **Penetration of agricultural insurance** is still low. A nation-wide crop insurance data by the National Institute of Securities Market or NISM (2014) shows that only 6.7% of the farmers are covered under crop insurance.
2. **Level of awareness** about crop insurance is very low.
3. The low usage indicates that farmers either do not find crop insurance useful or are denied access to insurance.

4. Other issues include delay in distribution of compensation, inadequacy of compensation compared to the costs and inadequate funds allocated to finance the insurance schemes.

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## 8. Agricultural Subsidies

An agricultural subsidy is a government incentive paid to agribusinesses, agricultural organizations and farms to supplement their income, manage the supply of agricultural commodities, and influence the cost and supply of such commodities.

Agricultural subsidy acts as an incentive to promote agricultural development in India. It helps stimulate agricultural production and attain self-sufficiency. Further, subsidies also contribute to better cropping pattern, employment and income of beneficiaries.

There are **different types of agricultural subsidies** being provided in India:

**Explicit Input Subsidies:** They are payments made to the farmers to meet a part of the cost input. For e.g., subsidy on improved or high yielding variety seeds, fertilizers, and plant protection chemicals for certain crops.

**Implicit Input Subsidies:** They are hidden in nature. In the implicit input subsidies, prices of inputs are administratively determined, and priced low compared to their economical cost.

**Output Subsidies:** This type of subsidy is provided in order to encourage the output of a particular product by partially offsetting the production cost or losses. The objective of this subsidy is to expand production of a particular product more so that the market would promote but without raising the final price to customers.

**Food Subsidies:** The difference between the per quintal economic cost and the per quintal Central Issue Price (CIP) gives the quantum of food subsidy. Food subsidy comprises of subsidy provided to Food Corporation of India (FCI) for procurement and distribution of wheat and rice and for maintaining the strategic reserves of foodgrains and subsidy provided to states or undertaking decentralized procurement.

As per the Economic Survey 2020, food subsidy incurred by the government has risen substantially over the years from about 0.6 lakh crore in 2009-10 to about 1.7 lakh crore in 2018- 19.

### 8.1. Agricultural subsidies can also be categorized on the basis of Mode of Payment:

**Direct Subsidies:** Direct subsidies are money transfers by the government that reach the ultimate beneficiary through a formal predetermined route. Direct subsidies increase the beneficiary's buying power and helps raise the living standards. In agriculture, direct subsidies help farmers buy the necessary inputs from the market. For e.g., PM KISAN, Minimum Support Price (MSP) and Direct Benefit Transfer (DBT).



**Indirect Subsidies:** Indirect subsidies are provided through price reduction, welfare and other ways but do not include a direct cash payment. They reach the farmers along with the use of inputs. Farmers get the subsidized product while the subsidy amount is provided to the provider of the product. For e.g., fertilizer subsidy, power subsidy, water subsidy, etc.

## **8.2. Issues related to the agricultural subsidies.**

1. Agricultural subsidies lead to a heavy **fiscal burden** on the government. The total outgo on fertilizer subsidy alone in 2017-18 was Rs. 70,000 crores.
2. Power subsidy has led to **overuse of groundwater** which has further resulted into dramatic fall in ground water levels.
3. Due to the fertilizer subsidy being offered, there has been an **indiscriminate use of fertilizers** by the farmers. This has led to a **decline in soil fertility** and an overall reduced agricultural productivity.
4. Fertilizer subsidies are generally **cornered by the manufacturers and the rich farmers** of Punjab and Haryana and it fails to provide benefits to the targeted groups, especially small and marginal farmers.
5. Price subsidies like Minimum Support Price (MSP) are **cereal centric** (rice, wheat etc.) and have neglected pulses, oil seeds and coarse cereals.
6. Most of the subsidies are **regionally biased** and have benefitted the rich states which are able to grow marketable surplus and have well developed infrastructure. States like Bihar and Eastern U.P have failed to derive similar benefits.

**In order to resolve the various issues related to agricultural subsidies**, following steps could be taken:

1. Better targeting of subsidies with the usage of JAM (JanDhan-Aadhar-Mobile Number) trinity can reduce the fiscal burden.
2. Government needs to rationalize certain subsidies like power subsidy to check indiscriminate exploitation of groundwater.
3. Promotion of soil health card, organic farming and neem coated urea can reduce the quantum of fertilizers used in agricultural fields. This will rationalize the fertilizer subsidies which has already put a heavy fiscal strain on the government.
4. Direct Benefit Transfer (DBT) of subsidies through Aadhar authentication will solve issues like inclusion-exclusion errors and ensure better targeting of beneficiaries.
5. Crop diversification by including more crops under Minimum Support Price (MSP) will benefits such farmers growing those crops.

## **8.3. Agricultural Subsidies and World Trade Organization (WTO)**

Some of the notable agreements under the WTO are as follows:

1. **Agreement on Sanitary and Phytosanitary Measures (SPS)** sets out the basic rules for food safety and animal and plant health standards.

2. **Agreement on Agriculture (AoA)** under which, 1st and 3rd world countries are required to limit their food subsidies to 5% and 10% respectively to the value of their agriculture production in 1986.
3. **Peace Clause** which gives temporary immunity India and other developing countries to continue their respective food subsidy programs and protects them from being challenged under other WTO agreements by countries like U.S.A.

Agreement on agriculture (AoA) aims to regulate the agricultural subsidies through its “box” mechanism.

1. “**Green Box** (subsidies that don’t disrupt trade or only cause minimum damage to trade balance)” and “**Blue Box** (subsidies that aim to limit production and don’t increase with production)” subsidies are allowed. E.g., subsidies given for research and cattle-vaccination.
2. “**Amber Box**” subsidies are subjected to quantitative limits as they are trade distorting in nature. E.g., subsidies on diesel, electricity and fertilizer, Minimum Support Price (MSP) etc.

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## 9. Public Distribution System

Public distribution system in India is a government sponsored chain of shops entrusted with the task of distributing basic food and non-food items to the needy sections of the society at very cheap prices. The PDS distributed commodities worth more than Rs 98,000 crore in 2014-15 through 5.21 lakh fair price shops. Rice, wheat, sugar, and kerosene have been the four major items of distribution under PDS.

### 9.1. Objectives of PDS are:

1. To provide essential consumer goods at cheap prices to the consumers.
2. To insulate them from the rising impact of prices of such commodities.
3. To maintain minimum nutritional status of our population.
4. To put indirect check on the open market prices of various commodities.

Public distribution system in India has evolved drastically since the time it was introduced in India.

1. **Targeted Public Distribution System (TPDS)**: It was introduced in 1997 and under it, license was given to panchayats, self-help groups, cooperatives, and individuals to open fair price shops/PDS shops. Beneficiaries can buy commodities like subsidized grains from such shop using their ration cards.
2. **Antyodaya Anna Yojana (AAY)**: It aimed at providing 35 kg subsidized grains for the poorest of poor family at a highly subsidized rate of Rs 2/kg of wheat and Rs 3/kg of rice.
3. **National Food Security Act (NFSA)**: It is a Central Sector Scheme enacted in 2013 by the **Department of Food and Public Distribution under the Consumer Affairs Ministry**. The scheme aims to provide subsidized food grains to poor families. Union procures food grains from farmers at **MSP** and sells it to the states at **Central Issue Price (CIP)**. States then sell the grains to the beneficiaries through fair price shops/PDS shops.

**67% of the Indian population** is covered under the scheme, including 75% rural population and 50% urban population (both Below Poverty Line and few Above Poverty Line families are covered). The beneficiaries are provided rice at Rs 3/kg, wheat at Rs 2/kg, and coarse grains at Rs 1/kg.

The **eldest woman in a household**, of age 18 years or above, is considered the head of the household for issuing ration card. This has been done to promote women empowerment. Further, **pregnant and lactating women** are entitled to “take home ration” of 600 calories per day during pregnancy and six months thereafter.

4. **One Nation One Card:** This scheme aims to connect all ration cards to a central server and provide Point of Sale (PoS) machines to all PDS shops. Doing this will enable all beneficiaries under NFSA to buy grains from any PDS shop in the country, irrespective of the state to which he belongs. The scheme will especially benefit the seasonal migrant workers.

## 9.2. Issues with PDS in India:

1. After the inclusion of NFSA-2013, the burden of **food subsidy has become huge**. The procurement prices have been rising continuously due to rich farmers' lobby and issue prices are getting lower due to populist policies. All of this together have made PDS unsustainable.
2. **Inefficiencies in the operations of Food Corporation of India (FCI)** due to highly centralized and bureaucratic mode of operations have resulted in an increase in the economic cost of FCI food grains operation.
3. For a long period of time, PDS operations have remained **limited mostly to urban areas** and rural poor have not benefitted much from PDS.
4. Since there is a residential requirement for ration cards, a large number of homeless people, migrants, etc. are automatically left out of food security.
5. PDS suffers from **leakages due to diversion** of foodgrains to the open markets because of widespread prevalence of corruption. NSSO data shows a huge leakage of 37% from PDS in 2011-12.
6. Due to large procurement of foodgrains every year by the government, the net quantities available in the open market reduces. This leads to increase in the price of commodities and inflation.
7. Improper targeting of beneficiaries has led to **inclusion-exclusion errors**. As per NSS-2007, 63% of the poor households were not covered under the TPDS system. Further, NCAER reported about "ghost" card holders/ghost beneficiaries.

## 9.3. Way Forward

1. **Shanta Kumar committee** in 2015 **recommended gradual introduction of cash transfers** in PDS, starting with large cities with more than 1 million population.
2. **Food coupons** can be provided to beneficiaries through which they can buy foodgrains from store, and the dealer could be reimbursed on production of these coupons at the govt treasure. This will help reduce the problems of procurements, diversion and black marketing of food grains.
3. Instead of buying through PDS, government should provide a **universal basic income** to all so that the needy could purchase foodgrains as per their choice.
4. **Private sector** should be encouraged to take up procurement, storage and distribution of foodgrains. This would ease the pressure on government agencies and increase efficiency.
5. Government should **diversify its procurement basket** so as to incorporate adequate nutrient mix. This will promote crop diversification and check the skewed incentive to grow only rice and wheat.

6. **Technological intervention** is the need of the hour in the PDS system. For e.g., truck dispatch information and stock availability at fair price shop through SMS to registered users and GPS based tracking of trucks carrying PDS goods can be implemented.
7. Fair price shops can be operated with the help of panchayats, cooperatives and self-help groups will lead to **community participation** and localized monitoring of PDS scheme.
8. **Proper identification of beneficiaries** will improve targeting. Creating a web database of beneficiaries with information on the allotted quantity of each good as per entitlement, computerized entry via Aadhar authentication at Point of Sale (PoS) machines, etc. can be done.

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## **10. Income Support to Farmers**

NABARD's **All India Rural Financial Inclusion Survey 2016-17** made the following observations:

1. Around 10 crore rural households out of 21 crore households are engaged in agriculture. However, the monthly average agricultural household income was a mere **Rs 8,931 in 2016-17**.
2. Even for the so-called agricultural households, just over 43% of their average income comes from cultivation of crops and rearing of animals.
3. 41% of the rural households are indebted, of which majority are agricultural households (43%).
4. Only 26% of the agricultural households out of the total rural households have any kind of insurance.
5. Only around 53% of agricultural households report savings in a financial institution indicating low levels of financial inclusion.

The above findings conclude that farm income levels are not satisfactory, making agriculture a non-profitable enterprise. A sound income level gives a sense of security to the farmers and encourages him to take risks. Having a high income promotes farmers to invest more in agriculture by adopting new technologies and purchasing better inputs (high quality seeds and fertilizers), which effectively increases agricultural productivity. A fair level of farm income also leads to socio-economic development of farming households, reduces rural indebtedness and minimizes farmer suicides.

### **10.1. PM KISAN**

PM KISAN is a Central Sector Scheme implemented by the Agriculture Ministry in which all farmers, irrespective of farm size, will get up to Rs 6,000 per year as minimum income support. The amount will be paid to each eligible farmer in three instalments and will be deposited directly to their bank accounts.

The **objectives of PM KISAN** are as follows:

1. To augment the income of the Small and Marginal Farmers (SMFs).
2. To supplement the financial needs of SMFs in procuring various inputs to ensure proper crop health and appropriate yields, commensurate with the anticipated farm income at the end of each crop cycle.
3. To protect SMFs from falling into the clutches of moneylenders for meeting such expenses and ensure their continuance in farming activities.

## 10.2. PM KISAN MAAN DHAN YOJANA

Government has launched the PM Kisan Maan Dhan Yojana (PM-KMY) with a view to provide **social security to Small and Marginal Farmers (SMFs)** in their old age when they have no means of livelihood and minimal or no savings to take care of their expenses.

Under the scheme, a monthly fixed pension of Rs 3000 is provided to the small and marginal farmers, subject to certain exclusion criteria, on attaining the age of 60 years. It is a voluntary and contributory pension scheme. The eligible farmer is required to contribute to a Pension Fund between Rs. 55 and Rs. 200 per month depending on the entry age. The Central Government contributes an equal amount to the Pension Fund.

Small and Marginal Farmers (a farmer who owns cultivable land up to 2 hectares as per the land records of the state) in the age bracket 18-40 years are eligible to join the pension scheme. Farmers who are **not eligible** to join the scheme includes:

1. Small/Marginal farmers who joined PM Shram Yogi Maan Dhan Yojana, National Pension Scheme, EPFO or any other government run pension scheme.
2. Farmers owning more than 2 hectares of land.
3. All persons who have paid Income Tax in the last assessment year.

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## 11. Introduction to Agriculture

### Definition

- Agriculture is the **science, art and practice of cultivating plants and livestock**.
- Aka it is the science or practice of farming, including cultivation of the soil for the growing of crops and the rearing of animals to provide food, wool, and other products.
- It was the **key development in the rise of sedentary human civilization**, whereby farming of domesticated species created food surpluses that enabled people to live in cities

### 11.1. Types of Agriculture

#### *Subsistence Agriculture*

- It is the **cultivation of small and scattered holdings** with the help of draught animals and family members with **primitive techniques**. It is practiced by majority of farmers across the world.

#### *Nomadic Herding*

- It is based upon the **rearing of animals on natural pastures**. This practice is performed by the people of **semiarid and arid regions**. This is a subsistence type of activity.

#### *Plantation agriculture*

- It was **introduced in India by Britishers** and involves growing and processing of a single crop purely meant for sale.
- Examples include plantations of **Tea, Rubber, Coffee, Cocoa** etc.
- Practiced mainly in **Assam, sub-Himalayan, West Bengal, Nilgiri, Annamalai and Cardamom Hills**.

#### *Shifting agriculture*

- Aka Jhum Agriculture. It involves **clearing of forest land by felling and burning and then growing crops**.
- The land is abandoned in 2-3 years after the fertility of the soil is lost. It is practiced by nearly 250 million people, especially in **North East India** and in the tropical rain forests of **South America, Central and West Africa, and Southeast Asia**.

#### *Livestock Ranching*

- Under this system of farming, the major emphasis is laid on **rearing animals**.
- Unlike nomadic herding, the farmers live a **settled life**. This type of farming has developed on a commercial basis in areas of the world where large plots of land are available for animal grazing, such as the low rainfall areas of **North America, South America and Australia**.



### ***Commercial Grain Farming***

- This type of farming is a **response to farm mechanization** and is the major type of farming in the areas with low rainfall and population.
- These crops are **prone to the vagaries of weather and droughts**, and monoculture of wheat is the general practice.
- Prairies, steppes, and temperate grasslands of **South America, Australia & New Zealand** are the main areas for this type of farming.

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