



4 PILLAR4A: SECTORS OF ECONOMY → AGRICULTURE

(Definition) Agriculture is a primary economic activity that includes growing crops, fruits, vegetables, flowers and rearing of livestock.

- **Modi-Target:** Doubling farmers' income by 2022-23 compared to ____.
- **UN-SDG#1:** End poverty in all forms.
- **UN-SDG#2:** Eliminate global hunger, protect indigenous seed and crop varieties, doubling agriculture productivity and small farmer incomes by 2030.
- **Sir Arthur Lewis' Dual Economy Model (द्वैत अर्थव्यवस्था):** Economic development results in labourers moving away from agriculture to the more productive industrial sector, & agriculture sector becomes less important part GDP.
- The number of people employed in agriculture is steadily falling down: 55% (2011) to 42% (2018) (*World Bank data*).
- The share of agriculture in the total GDP is falling down, but not steadily. ~15-17%
- The growth rate of agriculture has been zig zag due to El-Nino led drought years. Manmohan target was __ annual growth rate, Modi's 2x income target would require 10% annual growth rate in agriculture.

Agriculture & allied sectors (livestock, forestry, fishing)	2012 -13	2013 -14	2014 -15	2015 -16	2016 -17	2017 -18	2018 -19
Annual Growth Rate (%)	1.5	5.6	-0.2	0.6	6.3	5.0	2.7 (est)

4.1.1 [Yearbook-Info] Agro Ministry

Ministry of Agriculture and Farmers Welfare is made up 3 departments:

Agro-itself	Department of Agriculture, Cooperation and Farmers Welfare - Statutory: Coconut Development Board, National Cooperative Development Corporation, Protection of Plant Varieties and Farmers' Rights Authority, Registrar of Multi State Cooperative Societies. - Attached Office: National Rainfed Area Authority. - CPSE: National Seeds Corporation Ltd. (NSC) - Autonomous / Cooperative bodies: NAFED, Small Farmers Agribusiness Consortium (SFAC). Various boards / institutes for horticulture, plant health management, agro marketing etc.
Animals	Department of Animal Husbandry Dairying & Fisheries - Statutory: National Dairy Development Board (NDDB)
Agro Research & Extension	Department of Agricultural Research & Education - Autonomous body: _____ (ICAR: भारतीय कृषि अनुसंधान परिषद) - Central Agro universities @Imphal (Manipur), Pusa (Bihar), Jhansi (UP)

* Hindi terms not given for most org. because above information is meant for MCQ only. In the mains exam you may attribute all things to 'कृषि और किसान कल्याण मंत्रालय की वैधानिक/सहकारी/स्वायत्त संस्था <insert english term/abbreviation>'.



4.2 AGRI-INPUT → LAND

- While India accounts for more than __ % of world population but we have barely 2.5 % of land of the world.
- Agriculture is a purely land based activity. Size and quality of land has direct bearing on agriculture productivity and farmers' income. Land ownership also serves as a social value & security against credit.
- **Challenges?** Rising population, division of land among heirs → fragmentation of landholdings (भूमिजोत का विखंडन). Small sized-farms are not conducive for farm-machinery → productivity declines.
- **Solution?** Small-marginal farmers should be encouraged to join mfg / service sector jobs, selling their land to rich farmers = **Land** _____ (भूमि एकीकरण).
- **Land Reform (भूमि सुधार)** is the government led division of agricultural land and its reallocation to landless people. Whereas, **Land** _____ (भूमि अधिग्रहण) means Govt acquiring private land for industrial or infrastructure development.

4.2.1 Land reforms in India after independence

- (1) Zamindari Abolition, Vinoba's Bhudaan movement (2) Ceiling on Landholding i.e. fixing maximum size of land holding that an individual can own. (3) Laws to protection of tenant farmers (जोतदार किसान)
- (4) National Land Records Modernization Programme (NLRMP-2008: राष्ट्रीय भूमि रिकॉर्ड आधुनिकीकरण कार्यक्रम) by Department of Land Resources under _____ Ministry. Because digital land records help reducing court case related to sale / inheritance.
- (5) Forest Rights Act: वन अधिकार अधिनियम 2006 which gives 'patta' (farm land ownership title) to the forest dwellers, if the said family was cultivating that forest land for the last 75 years.
- Land is a state subject, so Union circulated Model Agriculture Land Leasing Act, 2016: which 1) protects land owner from illegal occupation by tenant farmer 2) helps tenant farmer get bank loans using leasing agreement as proof.

Further Self-study? (1) Land reforms is a Mains-GSM3 topic. Do it from mrunal.org/tag/land-reforms (2) Soil pollution & soil erosion is Environment topic do it from Shankar IAS book (3) Soil & Crop distribution: Geography topic from NCERT/ Majid.

MCQ. Which of the following are responsible for the decrease of per capita holding of cultivated land in India? (Asked in UPSC-CDS-2012-II)

1. Low per capita income.
2. Rapid rate of increase of population.
3. Practice of dividing land equally among the heirs.
4. Use of traditional techniques of ploughing.

Answer Codes: (a) 1 and 2 (b) 2 and 3 (c) 1 and 4 (d) 2,3 and 4



4.3 AGRI-INPUT → SEEDS: बीज

(Introduction: Origin) Since we can't drastically increase the area under cultivation, so, agriculture 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. But in India, _____ is less than optimum because of (1) new seeds are not affordable and 2) not available to all farmers. So, government has approved 100% automatic FDI in seed development.
- **Seed village concept:** Group of farmers in a village given training to produce seeds of various crops so they can fulfill seed demand of their own & neighbouring villages.
- **Seed bank / Seed vault** is a depository that stores seeds to 1) preserve genetic diversity 2) supply seeds during natural calamities and unforeseen conditions.
- Agro Ministry gives funding for above two initiatives.

MCQ. Which one of the following best describes the main objective of Seed Village Concept? (Asked in UPSC-Pre-2015)

- (a) Encouraging the farmers to use their own farm seeds and discouraging them to buy the seeds from others.
- (b) Involving the farmers for training in quality seed production and thereby to make available quality seeds to others at appropriate time and affordable cost.
- (c) Earmarking some villages exclusively for the production of certified seeds.
- (d) Identifying the entrepreneurs in villages and providing them technology and finance to set up seed companies.

4.3.1 Agri-Input → Seeds → Green Revolution: हरित क्रांति

- Green revolution refers to the large increase in food production with the help of _____ (HYV: उच्च उपज देने वाली किस्म) of hybrid seeds.
 - **Phase-1:** mid 1960s upto mid 1970s → focus on wheat, rice and more affluent states such as Punjab, Andhra Pradesh and Tamil Nadu.
 - **Phase-2:** mid-1970s to mid-1980s → HYV seeds were spread to a larger number of states and for variety from just wheat and rice.
- **Biofortification:** is the process by which the nutritional quality of food crops is increased. E.g. ICAR developed CR Dhan 310- a rice variety that has higher protein & zinc content than traditional rice.

4.3.2 Agri-Input → Seeds → Genetically modified (GM) crops

- **Hybrid seeds** (संकर बीज) are developed by cross-breeding / cross-pollination with other plants.
- Whereas, Transgenic / Genetically modified (आनुवंशिक आधार पर आशोधित किस्मे) seeds are developed by transferring selected genes from one organism into another. E.g. Bacterium *Bacillus thuringiensis* genes inserted in cotton → Bt. cotton → if bollworm pests eat it, they'll die due to toxin crystals in the Bt.cotton plant.
- **GM-Regulation?** Environment Protection Act 1986 (EPA: पर्यावरण संरक्षण अधिनियम) → _____ (GEAC: जेनेटिक/जननीक इंजीनियरिंग/अभियांत्रिकी मूल्यांकन समिति) conducts studies, and recommends approving a GM crop in India → Environment ministry gives final permission.



- Over the years, GEAC recommended Bt Cotton, _____ for India. But Environment ministry has allowed only Bt. Cotton (a non-food crop) cultivation in India (2002).

4.3.2.1 **Seeds → GM crops → Challenges?**

1. **Biosafety concerns (जैव सुरक्षा संबंधी चिंताएं)** GM food crops may be unsafe for human and animal consumption. They may harm the soil bacteria & bees → harm to entire food web and biodiversity. GM crop may eliminate the wild/indigenous species by cross-pollination: परपरागण.
2. American company Monsanto has the patent over Bollgard technology that is used for developing Bt Cotton seeds. So, Indian Bt-cotton seed production companies have to pay a type of royalty to Monsanto, called _____ (विशेषता शुल्क). Govt of India decides the ceiling on Trait fees. Some legal disputes going on. what/how/why NOTIMP.
3. Monsanto also owns patent over _____ technology (समापक जनीन प्रौद्योगिकी) i.e. when such seeds are planted, they'll produce crops only once. Their resultant crop's seeds will be sterile → Farmer forced to buy new seeds from company for every season. Although Terminator gene seeds are not allowed in India.

4.3.2.2 **Seeds → GM crops → suggestions by Economic survey 2017?**

We've a robust regulatory framework with GEAC. So, mischief is unlikely so we should allow GM crops with following precautions →

1. Allow GM seeds which don't have Terminator Gene or high cost.
2. Allow GM seeds that have following properties: 1) Disease, pest & drought resistant 2) Longer shelf life 3) Shorter crop duration 4) Nonfood / Tree format crops.
3. To prevent MNC monopoly on GM seeds, we've to encourage domestic companies.

4.3.2.3 **GM-Crops: Conclusion templates?**

- A. **Conclude in Favor:** India needs self-sufficiency in agriculture because of 1) SDG goal of ZERO HUNGER 2) Economic goal of low food inflation. GM-crop can help in this regard, so a positive consideration should be given GM adoption in India.
- B. **Conclude Against:** India is a signatory to Cartagena protocol to protect biodiversity. SDG Goal (#2.5) also requires all nations to protect the genetic diversity of plants and animals. Given the aforementioned concerns, GM crops should not be introduced in India without due diligence.

Further self study of GM Sci.tech / Biodiversity angles → (i) NCERT Biology class 12 chapter 12 (ii) Ravi Agrahari's Science Tech book: ch. On Biotechnology.

4.4 **AGRI-INPUT → WATER (IRRIGATION)**

Definition? The supply of water to crops at different intervals is called irrigation.

- While India accounts for more than __ of world population but we have barely 4% of world's water resources.
- India is a water stressed country. >50% of the agriculture depends on rainfall. Only four months of monsoon & if El-Nino we receive even less rainfall. → 2014 & 2015 drought → food inflation.
- To earn 2x (double) income, a farmer must cultivate multiple crops annually. But majority of farmers face water shortage so they can't do so.



- Budget-2017: NABARD given funds for long term irrigation infrastructure (20k cr) and Micro Irrigation (5kcr)

4.4.1 Agri-Input → Irrigation → Pradhan Mantri Krishi Sinchai Yojana

Boss? Agro Ministry (2015). _____ Scheme = Not 100% Funded by Union.

Aim? To improve the irrigation coverage, reduce the wastage of water, using 4-pillar strategy:

1. **Accelerated Irrigation Benefit Programme** (AIBP: त्वरित सिंचाई लाभ कार्यक्रम) → Requires Ministry of Water Resources to finish the ongoing national irrigation projects at a faster pace.
2. **Watershed Development** (जलस्राव विस्तार विकास) → Setup water harvesting structures like check dams, nala bund, farm ponds, tanks etc. Encourage traditional water storage systems such as Jal Mandir (Gujarat); Khatra & Kuhl (H.P.); Zabo (Nagaland); Eri & Ooranis (T.N.); Dongs (Assam); Katas & Bandhas (Odisha & M.P.).
3. **Har Khet ko Pani** → To distribute water to each and every farm.
4. _____ → Improve the water usage efficiency through Micro-irrigation devices such as drips, sprinklers, pivots, rain-guns. *Related terms* →
 - a. **Fertigation**: Mixing water-soluble fertilizers in drip system → fertilizer delivered into the root system → reduced wastage of fertilizers.
 - b. **Mulching**: It is a simple process of covering the bare soil with straw, wood chips, shredded bark etc. to reduce the water evaporation, soil erosion and weed growth.

Micro-irrigation challenges? High cost of purchase. Trampling by elephant, boar, nilgai etc damages the equipment, but repairman not available locally and repair costs not covered in crop insurance. So less adoption.

4.4.2 Agri-Input → Water (irrigation) → suggestions by Economic Surveys

1. River inter Linking project. Ref: mrunal.org/2018/07/upsc-model-answer-gsm1-river-linking.html
2. Encourage pulses cultivation in the drought prone areas.
3. Canal water usages: cost based water pricing, stop theft of water.
4. **Rain water harvesting** i.e. capture and store rainwater.
5. **Watershed management** i.e. building percolation tanks, recharge wells, etc. with community participation. It helps in conservation of rain, surface and groundwater resources.
6. And finally, a National level dedicated agency to push above things.

4.5 AGRI-INPUT → FERTILIZER (उर्वरक)

(Introduction: Definition) Manure / Compost is a natural substance from decomposition of organic waste. Whereas, **Fertilizer** is an artificial chemical prepared in factories to boost nutrients in the soil.

Fertilizers	Notes
Nitrogen (N) Urea	<ul style="list-style-type: none"> - Haber process: natural gas (methane) converted into ammonia (NH₃) → further processing to create Urea. Therefore urea production requires natural gas import. - Ministry of Chemicals and Fertilizers gives Indian companies subsidy to manufacture and sell it at cheap price to farmers.



	- Urea subsidy is a Central Sector Scheme = _____ paid by Union.
Phosphorus (P)	~80-85% demand is met via import. ISRO using remote Sensing technology to identify the potential mines for rock phosphate.
Potash (K)	_____ demand is met via import.

Ideal NPK ratio in soil: _____, for India it's 8:3:1 because subsidized cheap Urea → illiterate farmers use excessively. As a result →

1. Soil & groundwater pollution.
2. Subsidized urea smuggled to non-agro purpose in chemical industries related to dyeing, inks, coatings, plastics, paints even synthetic milk.
3. Subsidized urea also smuggled to Bangladesh and Nepal.
4. Increased use & smuggling → increased subsidy burden → increased fiscal deficit.

So government done following reforms to control urea misuse/overuse/diversion:

4.5.1 Prevent urea misuse → _____ (2010)

- पोषक तत्व आधारित सब्सिडी. _____ Scheme = 100% Paid by Union.
- **Boss?** Ministry of Chemicals and Fertilizers gives subsidy to company based on weight of the different nutrient in the fertilizer.
- So, fertilizer companies can make new product mixes according to soil requirement in each region.
- **Challenge?** Urea not covered in this scheme. Delay in NBS subsidy payments. Therefore Fertilizer companies focus more on urea more than other fertilizers. Urea overuse continued.

4.5.2 Prevent urea misuse → _____ (2015)

- **Boss?** Agro Ministry. _____ Scheme = not 100% funded by Union.
- मृदा स्वास्थ्य कार्ड contains the status of soils with respect to 12 parameters →

Macronutrients	_____
Micro - nutrients	Zn, Fe, Cu, Mn, Bo
Secondary- nutrient	S: Sulfur
Physical parameters	pH, electrical conductivity (EC0, organic carbon (OC)

- A farmer's land is tested & he is given updated soil card once in every 3 years.
- The card also advises on which type of crops, seeds, fertilizer, irrigation method will be suitable for his farm, according to his soil type.

4.5.3 Prevent urea misuse → **Neem Coating of Urea (2015)**

Boss? Ministry of Chemicals and Fertilizers. From 2015, Government made it mandatory for fertilizer companies to neem coat the urea before selling it. **Benefits?** →

1. Prevents diversion of subsidized urea towards non-agricultural purposes.
2. Neem coating slows down the release of nitrogen from urea → Improves the plant's absorption of Nitrogen from the urea → Yield is improved.
3. Reduction in pest and disease attack → pesticide consumption is also reduced.

4.5.4 Prevent urea misuse → **DBT of fertilizer (2018)**

Boss? Ministry of Chemicals and Fertilizers.



- Direct Benefit Transfer (प्रत्यक्ष लाभ अंतरण) in fertilizer: Fertilizer companies are paid subsidy only after the retailer has sold the fertilizer to farmer through Point of Sale (PoS) devices & noting down his Aadhaar Card/ Kisan Credit Card/Voter Identity Card etc. to verify his identity as farmer.
- Then Government transfers the subsidy amount directly into the bank account of the respective fertilizer company.

Benefits? Prevents diversion of subsidized urea towards non-agricultural purposes and towards Bangladesh / Nepal. (Unless बांग्लादेशी घुसपैठिए नकली आधार कार्ड बनवा कर ले जाए)

4.6 AGRI-INPUT → PESTICIDES & WEEDICIDES

(Introduction: Definition) Pesticides and weedicides (कीटनाशक, खरपतवार नाशक) are chemicals which are used for killing / controlling pests and weeds respectively.

- 25% crop loss on account of pests, weed, diseases but India's per hectare pesticide consumption is far less than first world. We should encourage organic pesticides and biocontrol agents.
- We should adopt **Integrated Pest Management** (IPM: एकीकृत कीट प्रबंधन) approach i.e. rather than eradicating pest population to 100%, just try to keep crop damage to economically tolerable level. Because even pests are important for biodiversity protection and food chain balance.
- Spread awareness about proper use of chemical pesticides (esp. Endosulfan) so it doesn't contaminate in food / land / water / human bodies excessively.
- 2019: Monsanto & its parent company Bayer fined in USA for their weedicide / herbicide '_____' (brand name 'Roundup') which was causing cancer. This weedicide is already banned in Punjab, Kerala and selected states of India (2018).
- Under Insecticides Act, 1968, Agro Ministry requires the companies to label the pesticides depending on increasing level of toxicity : green < blue < yellow < red.
- Pesticide Management Bill 2017 aims to replace the Insecticides Act of 1968 with larger penalties & jail time for selling of substandard / fake pesticides, additional powers to state governments etc. But not passed yet, so do not lose sleep.

4.7 AGRI INPUTS → DON'T USE CHEMICALS → PKVY (2015)

(Introduction: Definition) Organic farming-जैविक खेती is a type of agriculture that avoids the use of synthetic fertilizers, pesticides, and other chemical inputs. It relies on crop rotation, crop residues, manures, biofertilizers, biopesticides etc.

- **Ecological benefits?** Less use of chemicals → biodiversity protected, less soil pollution and water pollution. Less air pollution (because farmers will not burn the crop residue).
- **Economic benefits?** 1) organic products command higher prices among the health conscious buyers from developed countries → more exports → less CAD, more farmer's income. 2) less use of chemical fertilizers → governments urea subsidy bill will decline → fiscal deficit can be controlled.
- In 2003, recognizing the aforementioned benefits, _____ stopped entry of chemical fertilizers, and its Vidhan-Sabha declared the intention to become a 100% organic state. The goal achieved in 2015.



- 2015: To encourage organic farming in India, Union Govt. launched _____ (PKVY).
- **Boss?** Agro Ministry. _____ Scheme = Not 100% paid by Union. (60:40,90:10)
- **Mechanism?** Form a group of 50 farmers in a cluster to start organic farming. Every beneficiary farmer is given ₹ 20,000 per acre for 3 years for doing organic farming.

4.7.1.1 **Organic farming** → **Limitations?**

1. Organic farming yield (quantity produced per acre) is lower than conventional chemical-based farming. Difficult to produce off-season crops using organic farming. so if entire India became “100% organic farming” → food shortage → inflation.
2. Shelf life, color and texture of organically grown fruits/vegetables are less attractive than chemically grown hybrid / GM varieties. So, unless ordinary consumers are made aware of their health benefits they may not buy.

4.8 **AGRI INPUTS** → **FARM MECHANIZATION (मशीनीकरण)**

(Introduction: Definition) It means the higher usage of combine harvesters, land levelers, cultivators, tractors, reapers, threshers, trolleys and mechanical pickers etc.

- **Significance?** (1) ↑ productivity of land and labour by increasing more work output per unit time. (2) ↑ employment opportunities to rural youth in production, operation, and repair-maintenance of machines.
- **Labour augmenting technological progress:** Allows each laborer to be more productive e.g. Industrial revolution → James Hargreaves' Spinning Jenny that allowed each worker to spin eight cotton threads at once (1770).
- **Capital augmenting technological progress:** Allows capital assets / machinery to be more productive. E.g. wooden plough replaced with steel plough → more sturdy, requires less maintenance & repairs, resistant to water-fungal attacks.
- After MNREGA scheme (wherein villagers are guaranteed 100 days of unskilled manual work), the Punjab-Haryana farmers are facing shortage of farm-labourers in peak season, & forced them to offer higher wages → many of the them are opting for machinery to reduce labour requirement.
- **Challenges?** (1) Customized machinery required for India's soil and climatic diversity so R&D, Make in India required. (2) Small-marginal farmers lack financial resources to own machines so renting centres need to be setup.
- **Government Scheme?** 2017: Green Revolution - Krishonnati Yojana → Sub-Mission on Agricultural Mechanisation (SMAM): to address above challenges.

MCQ. The substitution of steel for wooden ploughs in agricultural production is an example of _____ technological progress. (Asked in UPSC-Pre-2015)

- (a) labour-augmenting (b) capital-augmenting (c) capital-reducing (d) None of the above.

MCQ. Private investment in Indian agriculture is mostly on labour saving mechanization. This could be a response to (Asked in UPSC-CDS-2015-II)

- (a) rising productivity of agricultural sector (b) rising inequality in agriculture
(c) rising wages and tighter labour market (d) debt write-off by the Government

4.9 **AGRI INPUTS** → **FINANCE / CREDIT: अर्थव्यवस्था/ साख**

(Introduction: Origin) Small and marginal farmers produce little marketable surplus, and often deprived of the remunerative prices even during bumper crops, so without borrowing



they can never buy inputs for the next cropping cycle. Economic Survey 2016 found an inverse relation between size of landholding vs. Indebtedness (ऋणग्रस्तता) of farmers i.e. small/marginal farmers are more indebted than big farmers.

The notable steps to enhance credit availability to farmers →

RBI's PSL norms: 10% to agriculture + 8% to Marginal Farmer (upto 1ht) & Small farmer (>1 upto 2ht).	Ref: Pill#1: Monetary policy handout
Nationalisation of banks after the Independence. Setting up of differential banks (RRB, LAB, SFB).	Ref: Pill#1: Bank classification handout
Kisan credit card scheme & interest subvention scheme	Ref: Pill#1: Financial inclusion handout

4.9.1 Agri-Finance → Negotiable Warehouse Receipts (NWR)

- Boss? Ministry of Consumer Affairs, Food & Public Distribution → Statutory Body **Warehousing Development and Regulatory Authority (WDRA: भांडागारण विकास एवं विनियामक प्राधिकरण)** - law in 2007.
- Farmer deposits his produce into WDRA registered warehouses and gets negotiable warehouse receipt (NWR; परक्राम्य गोदाम रसीद). He can use it in two ways
 - a. Pledge it in the banks to obtain loans for the next cropping cycle. OR
 - b. Trade it via the commodity exchange markets or electronic National Agriculture Markets (e-NAM).
- **Benefit?** NWR prevents the distress sale of agriculture produce. Farmer can wait and watch for the prices to improve before selling, while his crop is safely stored in the warehouse.
- 2017: Government launched Electronic Negotiable Warehouse Receipt (e-NWR) System. **e-NWRs** prevents tampering, frauds & loss of the receipt. Unscrupulous farmers will not be able to sell same receipt to multiple buyers or get multiple loans from multiple banks.

4.9.2 Agri-Finance → Loan waivers for the farmers

- Budget 2008: Agricultural Debt Waiver and Debt Relief Scheme (ADWDRS). On their outstanding crop-loans upto 29/Feb/2008→
 - o Small and marginal farmers given 100% _____ : कर्ज माफी;
 - o Other farmers were given 25% _____ : ऋण राहत.
- Department of Financial Services → paid the dues to the banks in a phased manner on behalf of farmers.
- 2009: 15th Lok Sabha Election.
- 2016-18: The state governments of Tamilnadu, Maharashtra, Karnataka, Uttar Pradesh, Jammu Kashmir, Punjab, Chhattisgarh Andhra Pradesh Telangana et al. also launched in similar debt waiver and debt relief.
- 2017: Budget gave 60 days interest waivers to farmers on account of the problems farmers suffered during demonetization in 2016.

4.9.3 Agri-Finance → Farm loan waivers: arguments in favour

1. 2002 onwards: BT cotton was approved → boost in agriculture production & income.
2. 2008: Post-subprime crisis and global financial crisis, the demand for textile declined in the international market → cotton prices fell in India → farmers suffered.



3. 2014: drought, 2015: again drought. Agri growth in zero to negative territory.
4. 2016-17: Demonetization → cash shortage → price of agricultural commodities fell.

Thus farmers are suffering for a decade (2008-18), as evident from the violent agrarian agitations in Madhya Pradesh, Uttar Pradesh and Maharashtra in 2017 and 2018. While corporate borrowers are eligible for loan restructuring, farmers are not given such benefits.

4.9.4 Agri-Finance → Farm loan waivers: arguments against

1. _____ (नैतिक जोखिम): Lack of incentive to be "disciplined", when risky behavior is insured by someone. If the government continue to give loan waivers, farmers will have no discipline to be efficient, cost-savvy and hard working.
2. Loan waivers undermine honest credit culture– Urjit Patel. NPA problem will get aggravated.
3. Loan waivers → Higher fiscal deficit → households and business firms will be hurt.
4. Total farm loans: ~5.5 lakh cr (2013). Out of that ~60% by formal lenders (banks, Microfinance etc.) Rest by informal money lenders (village baniya, shroff etc.) So even if loan waivers are announced, all farmers will not benefit from it.
5. Government's expenditure on healthcare is ~1.2% of GDP. WHO recommends 5%. If all the farm loans are waived it will cost 1.5% of GDP. So, if government has so much spare money to spend, it'll be better to spend in public healthcare which will benefit both farming and non-farming families.

4.9.4.1 Anti-Argument: Loan waiver will not stop farmer suicide

Farmer suicide is a result of:

1. Lack of marketable surplus produce because they've small landholding, lack of irrigation, high yielding seeds and fertilizers.
2. Lack of remunerative prices because of challenges in APMC, MSP and transport-storage infrastructure.
3. Lack of financial inclusion and financial planning. Even after good monsoon and good harvest, they waste money on social events and pilgrimage.

So, loan waiver is a short-term remedy that can't prevent farmer suicide until above three issues are addressed.



4.9.4.2 **Anti-Argument: Loan waiver will not improve GDP**

The economic survey 2017 observed:

$$\text{Consumption} + \text{investment} + \text{government expenditure} + \text{export} - \text{import} = \text{GDP}.$$

GDP component	What should happen after farm loan waiver?	
	In theory	In reality
+ Consumption (C)	Since farmers' previous loan repayment responsibility is gone, he can use the spare money to buy new tv, fridge, mobile, children education etc. so production will improve in associated sectors due to increased consumption.	World Bank observed that even after 2008's loan waiver scheme, rural consumption was not improved. Because farmers did not have the surplus money to spend anyways.
+ Investment (I)	Similar logic as above, once previous loan is waived, farmers would be investing more in the farm machinery, irrigation pump set, better varieties of seeds, fertilizers, cattle etc.	<ul style="list-style-type: none"> - This didn't happen because farmers did not have surplus money to spend anyways. - Loan waiver → Government borrows money from market → ' _ _ _ _ _ of corporate borrowers' → investment declined in corporate sector.
+ Govt. Expenditure (G)	Government expenditure increased	But it harms economy due to higher fiscal deficit.
NET Exports (= Export minus Imports)	After the loan waiver, farmer would have invested in better machinery seeds fertilizers → more agriculture production in India → exports will improve.	<p>Agriculture exports did not greatly improve because</p> <ol style="list-style-type: none"> 1. Climate change, extreme weather events → production is not greatly improving. 2. Protectionism by USA and EU

Conclusion- Template on Loan Waiver:

From the aforementioned analysis, it's evident that farm debt waiver will have negative macroeconomic consequences for India. Debt waiver is neither feasible nor sustainable solution against agrarian distress, we should work on more efficient and targeted ways to help farmers.

Mock question for Mains: Critically examine the need and feasibility of providing agriculture-debt waiver to small and marginal farmers of India. (250 words)



4.10 AGRI-INPUT → RISK REDUCTION → INSURANCE

(Introduction: Origin) Though agriculture sector is a minor contributor to India's GDP, but large proportion of our population depends on agriculture. Agriculture itself depends on monsoon, pests, disease and other vagaries of nature. But insurance penetration & insurance density is low in India.

- 2002: Agriculture Insurance Company of India Ltd. (AIC) was setup.
- Agro Ministry launched Pradhan Mantri fasal Bima Yojana (Core scheme) and other crop insurance schemes. Ref: Pillar #1D handout.
- **Challenges?** State Governments not paying their share of money in PM Fasal Bima Yojana, private insurance companies rejected / delaying claim settlements. Therefore, Union enacted new norms: State Government / Insurance Company will have to pay additional 12% amount to farmer as interest / penalty for delays caused by them (2018).

4.11 AGRI-OUTPUT → DON'T BURN THE CROP RESIDUE

(Introduction: Origin) Every year during Sept-October, farmers of Punjab and Haryana burn the paddy stubble & residue (फसल अवशेष) which are leftover from previous cropping season. Burning clears the farm land for sowing wheat for next cropping season.

- **Result?** Thick smog & air pollution in Delhi & surrounding region.
- **Solution?** _____ (स्वस्थानी उपजाऊकरन) and the 'Happy Seeder', a mechanical attachment to tractors that enables wheat sowing without having to get rid of paddy straw on the land.
- Budget-2018: Union to give 100% funding to Punjab, Haryana and Delhi to tackle this menace. Further, individual farmers to be given 50% subsidy for such machinery purchase.

4.12 AGRI-SELLING → APMC (कृषिगत उत्पाद विपणन समिति)

(Introduction: Origin) In the post independent India, despite the abolition of zamindari, the farmers were not 'liberated' from exploitation. Because, the goons of local baniyaa or money lender would forcibly take away the farmers' harvest without paying sufficient money. So, state governments enacted APMC laws that "first sale of agriculture produce can occur only at the market yards / Mandis of _____ (APMC)."

4.12.1 APMC Problems?

1. APMC trustees (office bearers) are politically influential persons. They enjoy a cozy relationship with the licensed commission agents. These agents then form cartel, manipulate prices and deprive farmers of remunerative prices; they also engage in hoarding & artificial shortage of food supply in the retail market, thereby driving up the food inflation for profiteering.
2. APMC trustees lack the managerial skill / vision for vertical integration with food processing industries. [because their only skill is 'Politics']
3. While these Mandis charge multiple entry, exit and other fees. But money is siphoned off → poor infrastructure, lack of cold-storage and transport facilities → substantial waste of fruits & vegetables despite bumper harvests in good monsoon years.

4.12.2 Model APMC Act?

Since agriculture is a state subject, ultimately state governments have to reform their archaic laws. Union Government already circulated a model APMC Act, 2003



- It allows the private entrepreneurs and cooperatives to set up their parallel markets, & sell directly to consumers
- It allows the corporate companies to engage farmers in 'contract farming (अनुबंध खेती)' and directly purchase the produce from farmgate.

Further, Union Government released

- Model Agricultural Produce and Livestock Marketing Act 2017 (APLM: मॉडल कृषि उपज और पशुधन विपणन) → it has better features than above model act, covering both agro commodities as well as livestock, fisheries and poultry.
- Model Contract Farming Act, 2018 → (concurrent list) → aims to protect farmers engaged in contract farming with better features than model APMC act 2003.

MCQ. In India, markets in agricultural products are regulated under the (Asked in UPSC-Pre-2015)

- (a) Essential Commodities Act, 1955
- (b) Agricultural Produce Market Committee Act enacted by States
- (c) Agricultural Produce (Grading and Marking) Act, 1937
- (d) Food Products Order, 1956 and Meat and Food Products Order, 1973

4.13 AGRI-SELLING ONLINE → _____ (E-NAM)

- **Boss?** Agro Ministry (2016). _____ Scheme = 100% paid by Union.
- e-NAM (ई-राष्ट्रीय कृषि बाजार) aims to connect the existing 580+ APMC mandis across India through a web portal, thus enabling interstate and intrastate (within state) trade of agricultural commodities.
- It'll also remove the information asymmetry (सूचना की विषमता) between buyers and sellers, and help in real time price discovery based on actual demand and supply.

e-NAM: Criticism? While the portal was launched for namesake in 2016, but, first inter-state trade started only in 2019. Only 16 states have so far connected their mandis with the web portal. Many APMC mandis lack in quality-check labs for grading of the commodities before online auction- so buyers hesitant to purchase. + Delays in the actual delivery.

4.13.1.1 Agri-Selling Online → e-Rashtriya Kisan Agri Mandi (e-RaKAM) 2017

- This portal is a joint initiative by state-run-auctioneer METAL SCRAP TRADE CORPORATION LIMITED (MSTC- a Government company under the Steel Ministry) and Central Warehousing Corporation (a statutory corporation under Consumer Affairs Ministry).
- It helps farmers to sell agricultural produce. Although faded / obscure topic compared to E-NAM so don't lose sleep over it.

MCQ. What is/are the advantage/advantages of implementing the 'National Agriculture Market' scheme?(Asked in UPSC-Pre-2017)

1. It is a pan-India electronic trading portal for agricultural commodities.
2. It provides the farmers access to nationwide market, with prices commensurate with the quality of their produce.
3. Both 1 and 2
4. Neither 1 nor 2



4.14 AGRI-SELLING → GRAMIN AGRICULTURAL MARKETS (GRAMS)

- **Boss?** Agro Ministry (2018) → NABARD fund for Agri-Market Infrastructure Fund (AMIF).
- Gramin Haats are owned by Local Bodies (Panchayats/councils), Agricultural/ Horticultural Departments of State Govts, Cooperatives, APMCs and Private Sector. Total ~22,000 of them. Whereas APMC mandis are barely 580+.
- Budget-2018: 1) we will upgrade Gramin haat into GrAMs (ग्रामीण कृषि बाजार) 2) We'll link them with e-NAM. So, farmers can directly sell from nearby Gram Haat, instead of transporting the produce to the APMC Mandis at the district level.

4.15 AGRI-SELLING → OUTSIDE INDIA → AGRICULTURE EXPORT POLICY, 2018

- **Boss?** _____ Ministry
- **Target?** To double agricultural exports from present ~US\$ 30+ Billion to ~US\$ 60+ Billion by 2022 and reach US\$ 100 Billion in the next few years thereafter.
- To diversify our export basket e.g. Wild Herbs, Medicinal Plants, Aromatic Oils, Frozen vegetables; Biscuits, Confectionery & Processed Food etc.
- To diversify destinations e.g. Biscuits to Uganda, Nigeria, Kenya. (because Americans are unlikely to be attracted to our Parle-G biscuits.)
- To boost value added agricultural exports e.g. cashew apple jams, flavoured / roasted cashew, etc. instead of exporting raw cashew.
- To help exporters with sanitary and phyto-sanitary (SPS) issues via APEDA, FSSAI and other bodies. So their products are not banned by US/EU on the allegations of pesticide residue / pathogen / fruit fly contamination.
- To focus on branding, packaging & marketing of Indian ethnic products e.g. canned Indian cuisine like sarson da saag, Makhana from Bihar, Agra petha, Hyderabad biryani in overseas markets.
- To focus on R&D for gluten free, fibre rich products to cater health conscious consumer overseas.
- Encourage private investments through Ease of doing biz. in export oriented activities: cold storage, packaging, air cargo; Creation of Agri-start-up fund.

Conclusion? Thus, this policy will help integrating Indian agricultural products with the global value chains and help doubling farmers' income by 2022.

4.16 AGRI-SELLING → INCOME SUPPORT FOR FARMERS

2018: NABARD released All India Rural Financial Inclusion Survey.

- Total ~21 crore rural household. Out of them ~10 crore engaged in agriculture.
- These agricultural households' average monthly income is ₹ 8900/-
 - Out of that agriculture cultivation brings barely ₹ 3100.
 - Rest of the income comes from livestock, wage labour, MNREGA etc.
- Thus farming is not a very profitable enterprise in India.

Economic survey 2018 noted: Climate change's negative impact is twice on unirrigated farms than irrigated. With higher temperature and shorter rainfall: income fall will be 15-18% (for irrigated farm), 20-25% (for unirrigated farm).

Modi-govt has target of doubling the farmers income (from base year 2015-16) in 2022-23. But for that agricultural sector must grow at 10% annually whereas it's struggling to grow even @5%! Therefore, Govt. intervention is necessary in the form of subsidies, procurement, MSP and minimum income support (PM-KISAN@6k/pa).



4.17 AGRI-SELLING → MINIMUM SUPPORT PRICES (MSP)

Under the State APMC Acts, the first sale of agriculture commodity can occur at Agricultural Produce Market Committee (APMC) Mandis only. However, a farmer may not get remunerative prices at the Mandi due to following reasons:

1. Bumper production /supply which brings down the market prices AND / OR
2. Cartelization / price-fixing by the mandi-merchants.

So, to protect the farmers, Government of India announces MSP (न्यूनतम समर्थन मूल्य) before each crop sowing season.

4.17.1 MSP covers which crops?

For 22 crops (MSP) + 1 sugarcane (FRP) = 23 viz.

14 kharif crops	<ul style="list-style-type: none"> - Kharif: grown in summer / monsoon season. - paddy, jowar, bajra, maize, ragi, arhar, moong, urad, groundnut-in-shell, soyabean, sunflower, sesamum, nigerseed and cotton;
6 rabi crops	<ul style="list-style-type: none"> - Rabi: grown in winter season. - wheat, barley, gram, masur(lentil), rapeseed/mustard and safflower
3 commercial /cash crops	<ul style="list-style-type: none"> - Jute, copra and Sugarcane. - For Sugarcane, mechanism is different: It requires the sugar mill companies to pay the minimum Fair and Remunerative Price (FRP) fixed by Govt. (Whereas for other 22, Govt itself procures @MSP)

MCQ. Consider the following:(Asked in UPSC-Pre-2018)

1. Areca nut 2.Barley 3.Coffee 4.Finger millet 5.Groundnut 6.Sesamum 7.Turmeric
The Cabinet Committee on Economic Affairs announces MSP for which of the above?

- (a) 1, 2, 3 and 7 only (b) 2, 4, 5 and 6 only
(c) 1, 3, 4, 5 and 6 only (d) 1, 2, 3, 4, 5, 6 and 7

4.17.2 MSP computation, Swaminathan Committee?

Agro Ministry's Commission for Agricultural Costs and Prices (CACP: कृषि लागत और मूल्य आयोग) recommends MSP (& FRP for sugar) → Cabinet Committee on _____
_ (CCEA: आर्थिक मामलों की कैबिनेट समिति) chaired by PM approves & announces MSP.

CACP's computation method is →

A2	Actual costs directly incurred by the farmer on seeds, fertilisers, pesticides, hired labour, depreciation on farm buildings & machinery, interest on working capital, diesel/electricity for tractor/ pump sets etc.
FL	Imputed cost of (unpaid) family labour.
_____ times	This will be the official MSP. (from Budget-2018 onwards). So farmer sees 50% profit on this cost of production.

The National commission on farmers (2006) headed by Scientist MS Swaminathan had suggested 50% profit but using a different '**C2 formula**', BUT

- C2 formula computed lot of costs, including imputed rent on his own land and imputed interest on his own capital etc. (i.e. what if farmer had leased the farmland or



gave his savings as loan to someone else, instead of farming by himself, then how much rent / interest would he have earned?)

- If govt. used C2 formula, MSP will become very high due to aforementioned (hypothetical) imputed costs → higher budgetary allocation, fiscal deficit will increase. So, Govt is using A2+FL formula only.

MCQ. The Fair and Remunerative Price (FRP) of sugarcane is approved by the (Asked in UPSC-Pre-2015)

- (a) Cabinet Committee on Economic Affairs.
- (b) Commission for Agricultural Costs and Prices.
- (c) Directorate of Marketing and Inspection, Ministry of Agriculture.
- (d) Agricultural Produce Marketing Committee.

4.17.3 Agri-Selling → MSP → Procurement (अधिप्रापण / खरीद)?

- Central agencies namely, Food Corporation of India (FCI), Cotton Corporation of India (CCI), Jute Corporation of India (JCI), Central Warehousing Corporation (CWC), National Agricultural Cooperative Marketing Federation of India Ltd. (NAFED), National Consumer Cooperative Federation of India Ltd. (NCCF), and Small Farmers Agro Consortium (SFAC) will purchase the entire quantity offered by the farmers at MSP.
- So, it's also called 'Open Ended Procurement' i.e. whether farmer brings 20/200/2000/xyz kilo, Govt agencies will buy it, without any 'quota' for every farmer.
- Collectively, this entire mechanism is called **Market Intervention Scheme and Price Support Scheme** (MIS-PSS: बाजार हस्तक्षेप योजना और मूल्य समर्थन योजना).
- **Boss?** Agro Ministry. Central Sector Scheme = 100% paid by Union. (Int-Budget-2019: ₹ 3000 crore)

4.17.4 MSP Benefits?

- ✓ Farmer always has the option to sell produce to government, if he can't get remunerative prices from private merchants. It prevents distress-sale of produce at throwaway prices to private merchants.
- ✓ Government announces MSP before the sowing season for 23 crops including cereals, pulses, oilseeds & certain cash crops. This advance information helps the farmer to make an informed decision about which crop to sow for maximum economic benefit within the limitations of his farm size, climate and irrigation facilities.
- ✓ MSP sends a price-signal to market that if merchants don't offer higher than MSP prices the farmer may not sell them his produce. Thus MSP serves as an anchor or benchmark for agro-commodity market. While MSP doesn't guarantee that market prices will always be higher than MSP, but at least it ensures the market prices will not be drastically lower than MSP.

4.17.5 MSP Limitations?

- X FCI/NAFED procurement (अधिप्रापण) is usually confined to big towns and district centres. Farmers in remote & tribal area unable to bring their produce to the procurement agencies due to high cost of transportation. 1997: Government launched Decentralized Procurement (DCP: विकेंद्रीकृत अधिप्रापण योजना) wherein State Government themselves procure wheat and rice from farmers, & Union will bear the costs. But not much success in increasing the penetration yet.



- X Procurement is usually confined to rice and wheat (cereal grains). Not done for pulses, oilseeds and other crops. So, aforementioned benefits of MSP remain 'only on paper', they are not implemented in reality.
- X MSP not even announced for vegetables and fruits.

4.18 AGRI-SELLING: PM-AASHA TO FIX MSP LIMITATIONS

Pradhan Mantri _____ .

Boss? Agro Ministry (2018-Sept). Central Sector Scheme = _____ funded by Union.

The scheme has three components:

1. **Price Support Scheme (PSS: मूल्य समर्थन योजना):** Central Agencies will henceforth also do physical procurement of pulses, oilseeds and Copra.
2. **Price Deficiency Payment Scheme (PDPS: मूल्य में कमी भुगतान योजना):** If Farmers sells oilseed crops to private merchants in APMC-mandis who are paying them less than MSP price, then govt will directly transfer the difference money in farmer's bank account.
3. **Private Procurement Stockist Scheme (PPSS: गैर-सरकारी प्राप्ति थोक-व्यापारी योजना):**
Private agencies will be hired for procuring the commodities at MSP on behalf of Govt.

4.19 AGRI-SELLING: DIRECT INCOME W/O SELLING → PM-KISAN@6K/PA

_____ - Income Support Scheme

- **Boss?** Agro Ministry. Central Sector Scheme = _____ paid by Union.
- **Beneficiary?** A small / marginal farmer family comprising of husband, wife and minor children -who collectively own cultivable land upto 2 hectare as per the land records of the concerned State/UT. (2 hectare = ~5 acres).
- There are total 12 crore such families.
- **Entitlement?** Direct Benefit Transfer (DBT) of ₹ _____ per year in three equal installments (₹ 2000 x 3) in the beneficiary's bank account. Thus, eliminating middlemen and corruption.

Timeline?

- **1/2/2019:** PM-KISAN scheme announced for the first time in interim budget 2019 & allotted annual ₹ 75,000 crores for Financial Year 2019-20.
- **24/2/2019:** Modi formally launched from Gorakhpur, UP.
- The benefits are given with retrospective effect from 1/12/2018 (so, addl. ₹ 20k crores are allotted for this previous-installment in revised estimates of 2018-19).

Documents required?

- Farmer may show Aadhar card, driving Licence, Voters' ID Card, MNREGA Job Card etc. State authorities will cross check it against their land ownership database.
- Aadhar card is kept optional for the 1st and 2nd installment. But, in subsequent installments, Aadhar to be compulsory for farmers for verifying their identity.
- Mobile number is optional but State Govt are encouraged to capture it.
- Compulsory to give Bank account number and its IFSC code (This code is written on bank's passbook, helps identify the name of the bank and address of the branch.)
- **Mechanism?** Union ₹ → State govt's bank account → beneficiary's account. States send data to <http://pmkisan.nic.in> portal.
- **Complaint?** District Level Grievance Redressal Committees.



4.19.1 PM-KISAN: Criticism / Challenges?

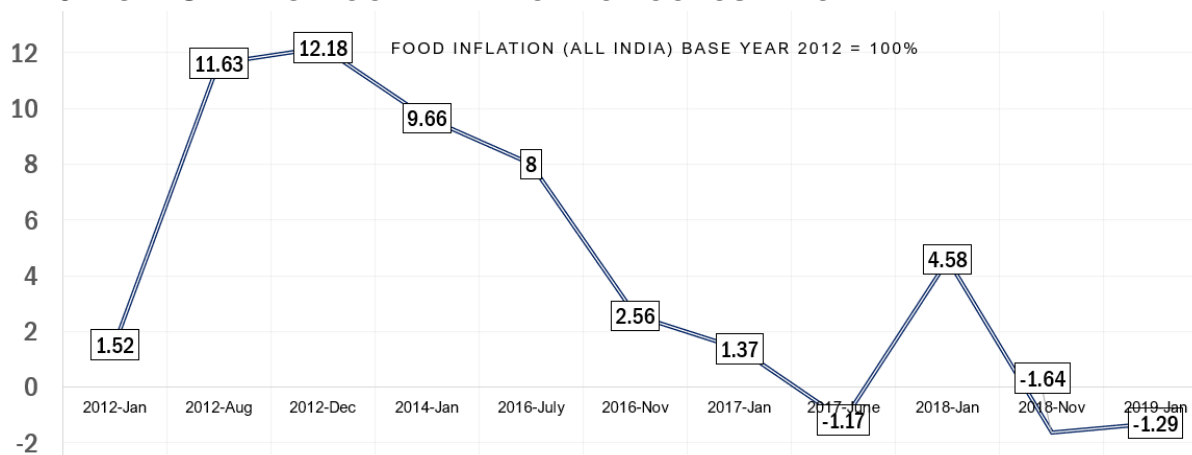
1. If a farmer's name is not in the land records of State/UT then he's not eligible. This excludes
 - a. landless / tenant farmers - who cultivate someone else's land on contract.
 - b. Tribal farmers who may not have land ownership documents.
2. It excludes farmers with land above 2 ht. But in drought prone / rain-fed areas, even they require income support because their income is low.
3. ₹ 6000 rupees per year is too little amount to cover the cost of seeds, fertilizers, wages of farm labourers. For a 2 ht land, minimum input cost is ~₹ 50k in reality.
4. Some state governments are running better schemes on their own e.g.
 - a. Telangana's Rythu Bandhu scheme gives upto ₹ 40,000 per year.
 - b. Odisha's KALIA scheme gives ₹ 10,000 per year to families without any conditions about their land holding area.

Counter-argument? Union government has launched a scheme within the constraints of fiscal deficit target. 14th finance commission has provided 42% tax devolution to the states so they may run parallel schemes with their own funds for the farmers' welfare. PM-Kisan is a better alternative than one time loan-waivers.

Conclusion template?

Successive economic surveys have noted that farming is not a profitable enterprise in India. <insert UN-SDG Goal#1, 2, Modi-Target 2x income>. However, an Indian farmer is often at the mercy of the monsoon & the APMC-merchants. PM KISAN income support scheme is a notable initiative to empower him.

4.20 AGRI-SELLING: FOOD INFLATION FOR CONSUMERS



(Introduction-Origin) With green revolution, we became self-reliant in cereal production. But perishable fruits and vegetables have remained our Achilles' heel. Seasonal spikes in onion, tomatoes & pulses is a recurring nightmare for middle class families of India. The underlying causes as following:

1. **Demand Side:** Growth of middle class & their disposable incomes → more demand of fruits/veggies than before.
2. **Supply Side:** shortage of commodities on account of 1) poor monsoon & pests 2) post-harvest losses due to unavailability of cold-storage & warehousing 3) hoarding.

4.20.1 Food Inflation due to shortage of Vegetable supply

1. Every year, Global Warming: April-May heat waves destroy nascent flowers / buds of vegetable plants.



2. Pests & Diseases: Maharashtra and Southern Indian farmers have been growing tomatoes & onions since last 3 decades. But, overuse of general pesticides → whiteflies, red mites, gram pod borers and other pests have gained immunity. → crop-loss has increased. Farmers had started using Swiss-MNC developed seeds but later they were found to be vulnerable to certain viral diseases.
3. UPA-Congress Govt (2004-14) had rapidly hiked MSP for wheat & rice so many farmers shifted from veggies / pulses to cereal production.
4. After demonetization (2016), cash based retail vegetable industry suffered → lower prices to farmers in the last season. So they shifted away from vegetables towards sugarcane, maize, soya etc. cash & cereal crops → veggies production has declined.
5. Heavy rains, floods and cyclones disrupt the supply chains. Farmer strike in Maharashtra, UP & MP, wherein they destroyed truckload of tomatoes, milk, potatoes etc. to vent their grievances.
6. Shortage of cold storage infrastructure. Big traders utilize them for hoarding onions and potatoes, → less space for other vegetables' storage even during bumper crops.

4.20.2 Food Inflation due to shortage of Pulses supply

1. Finest irrigated land used for cereal and cash crops like sugarcane because of better MSP. So pulses' area under cultivation is declining. Govt should tweak the MSP for pulses cultivation, especially in rain-fed areas because pulses require less water than sugarcane.
2. Pulses make the soil nitrogen rich, it encourages weed growth- which harms the pulses yield. Pulses are themselves protein rich, so they're more susceptible to (1) pests attack and (2) When stored in open godowns, humid conditions = fungal growth. 25% of the produce is lost by this. **Solution?** New seed varieties required but Indian scientists are always focused on 'cereals' rather than 'pulses'.

4.21 AGRI-SELLING: FOOD-INFLATION: GOVT INITIATIVES?

- **Minimum Export Price (MEP: न्यूनतम निर्यात मूल्य)** It is the price below which of commodity cannot be exported from India. During inflation in a particular agricultural commodity, commerce ministry will raise MEP to discourage its export from India and increase its availability in the local market. **Limitation?** Frequent revisions in MEP creates uncertainty for exporter-oriented farmers for the next cropping season.
- Hoarding by big traders to create artificial shortage & food inflation. _____
_____ (1955: आवश्यक वस्तु अधिनियम) If the Union finds that a certain commodity is in short supply and its price is spiking (agro, fertilizer, edible oil etc.) then it can notify stock-holding limits for a specified period.
- **Limitation?** The state govts. have to enforce it. But not done in letter and spirit due to nexus between politicians & big traders who provide them election funding.

4.21.1 Food Inflation → Govt initiatives → OMSS

- 1964-65: A statutory corporation Food Corporation of India (FCI: भारतीय खाद्य निगम) was set up under Ministry of Consumer Affairs, Food and Public Distribution (उपभोक्ता मामले, खाद्य और सार्वजनिक वितरण).



- By default, FCI procures cereals/foodgrains @MSP & sells them to poor-families via the **Public Distribution System** (PDS:सार्वजनिक वितरण प्रणाली) outlets.
- However, during food inflation, FCI would also sell the grains in open market to increase supply and curb price rise. This is called _____
Scheme [खुला बाजार बिक्री स्कीम].
- **Limitation?** While OMSS can help during shortage / inflation of cereal grains (rice, wheat). But, not much useful in veggies because they're out of FCI-MSP ambit.

4.21.2 Food Inflation → Govt initiatives → _____ Fund (2014)

- मूल्य स्थिरीकरण कोष is a Central Sector Scheme = 100% funded by Union.
- **Boss?** Agro Ministry gives Interest free loans given to FCI, NAFED & other central/state agencies to procure pulses and perishable vegetables from local and foreign farmers and sell it to *aam-aadmi* at reasonable prices.

4.21.3 Food Inflation → Govt initiatives → _____ for T-O-P (2018)

- **Boss?** Food Processing Ministry → NAFED given ₹ 500 crore.
- NAFED pays money / subsidy to the farmer self help groups, food processing companies etc. for processing, transportation & cold storage of Tomato, Onion and Potato (TOP), to ensure their round the year availability in market at a reasonable price.

Conclusion-Template? Vegetables and pulses are rich source of vitamins and nutrients. They're part of large varieties of Indian and international cuisines. Therefore, food Inflation is a matter of concern for (1) nutritional security in India and (2) India's export competitiveness. Hence aforementioned factors need to be addressed on priority basis.

MCQ. India has experienced persistent and high food inflation in the recent past. What could be the reasons?(Asked in UPSC-Pre-2011)

1. Due to a gradual switchover to the cultivation of commercial crops, the area under the cultivation of food grains has steadily decreased in the last five years by about 30%.
2. As a consequence of increasing incomes, the consumption patterns of the people have undergone a significant change.
3. The food supply chain has structural constraints.

Answer Codes: (a) 1 and 2 only (b) 2 and 3 only (c) 1 and 3 only (d) 1, 2, and 3

4.22 AGRO-SELLING→ DEFLATION (2017 ONWARDS)

While agri. Inflation was a recurring nightmare during UPA-Congress raj (2004-14), the Modi-raj has resulted in food-deflation (fall in the prices) for 3 reasons:

1. Demonetisation, limits on cash transactions and fear of being tracked by IT/GST authorities → Traders are less inclined to hoarding → more supply available at market.
2. Protectionism by US/EU & fall of International commodity prices → India's agro exports are down → More supply available in domestic market.
3. Urjit Patel's hawkish policy helped curbing inflation.



4.23 AGRO-SELLING → DEFLATION → SUGAR MILLS' PROBLEM

- Bumper production of sugarcane in India and Brazil → fall in global sugar prices but to keep Indian farmers happy Govt did not reduce FRP → Mill-owners' arrears to farmers (i.e. previous payment not cleared yet.) → Ministry of Consumer Affairs, Food & Public Distribution gave mill-owners soft loans. It also raised the Minimum Selling Price (MSP) of sugar from factory gate to wholesalers from ₹ 29 → ₹ 31/kg.
- Finance Ministry imposed 100% custom duty on import of sugar & 0% custom duty on export of sugar to help Indian sugar mills.
- 2019-March: Brazil and Australia filed official complaint in WTO that Indian Govt's subsidies/soft-loans/tariff to sugar sector led to excess supply & "depressed" global prices so their local industry is hurt.

4.24 AGRICULTURE PRODUCTION & PROCESSING → OTHER SCHEMES

4.24.1 Agro Production & Processing → Farmer Producer Company (FPC)

- Western economists had predicted that small farms will eventually cease to exist as big farmers will buy their land, but that hasn't happened in India. So, Government decided better to enable small farmers to setup company & combine their landholdings.
- 2003: Companies Act, 1956 was amended to allow new type of company- FPC.
- FPC is a hybrid between a private limited company (=professional management) and a cooperative society (mutual benefits without excessive weightage to who contributed how much land / share capital.)
- FPC can be setup by minimum 10 farmers (no upper limit). However, FPC is not allowed to become a Public Ltd. company i.e. they can't invite public at large to invest in their shares/bonds.
- Agro ministry gives them upto ₹ 10 lakh equity support, & additional credit guarantee for bank loans.

4.24.2 Agro Production & Processing → RKVY & RAFTAAR (2017)

- Boss? Agro Ministry. Core Scheme = not 100% funded by Union.
- _____ (RKVY) started during UPA/Congress (2007).
- 2017: Modi renamed and rebranded it to RKVY-RAFTAAR i.e. Remunerative Approaches for Agriculture and Allied sector Rejuvenation.
- It's a _____ scheme- will expire in 3 years (2017-2020).
- It provides funding for Infrastructure creation (warehouse, cold storage, market facility etc.); training & skill development (Mushroom cultivation, beekeeping, aromatic plant cultivation, floriculture) and financial support to farmers to start agri-enterprise after getting the training.

4.24.3 Agro Production & Processing → Green Revolution - Krishonnati Yojana

- **Boss?** Agro Ministry. **Core** scheme= not 100% paid by Union.
- It's a SUNSET scheme 2017 to 2020. (Unless renewed and continued further)
- 2017: Modi made this umbrella scheme (छतरी योजना) by combining previous 11 Congressi Schemes viz.

1. Mission for Integrated Development of **Horticulture** (MIDH:बागबानी एकीकृत विकास): Bee keeping also promoted in it. One of MIDH sub-mission is 'Coordinated Programme on



- Horticulture Assessment and Management using 'geo-informatics' (Project CHAMAN) to use space technology / remote sensing data to assess the horticulture production & diseases in India. 2018: Phase-II of Chaman launched.
2. National **Food Security** Mission (NFSM) to increase production of rice, wheat, pulses, millets (coarse cereals) and commercial crops & restore soil fertility.
 - a. 2018 declared as “**National Year of Millets**”. Further, UN & FAO accepted India's proposal to celebrate _ _ _ _ as **International Year of Millets** (अंतर्राष्ट्रीय बाजरा वर्ष). Because, millets are tolerant to drought, climate change, photo insensitive; need less water, provide nutritious elements in poor families' diet. So, Govt create two sub-missions.
 - i. NFSM on Makka and Jau.
 - ii. NFSM on Nutri-Cereals (पौष्टिक अनाज) - Jowar, Bajra, Ragi and little millets like Kutki, Kodo, Sawa, Kangni and Cheena.
 - b. NFSM has another sub-mission: National Mission on Oilseeds and Oil Palm (NMOOP: तिलहन और तेल पाम) to augment the availability of vegetable oils and to reduce the import of edible oils. Associated term: Yellow Revolution.
 3. National Mission for **Sustainable Agriculture** (NMSA: स्थायी / सतत कृषि के लिए राष्ट्रीय मिशन) to encourage organic manures, bio fertilizers, cropping practices for soil and moisture conservation measures; Rainfed Area Development (RAD) programme.
 - a. Subscheme: National Bamboo Mission (NBM) to augment the income of farmers. Further, Indian Forest Act, 1927 was amended to exclude bamboo from the definition of 'trees'. This will encourage bamboo grown outside forest area without interference from Forest Department.
 4. Sub-mission on **Agriculture Extension** (SMAE: कृषि विस्तार पर उप मिशन): farmers training & skill development with more use of electronic / print media, mobile apps and ICT tools, etc.
 5. National **e-Governance** Plan on Agriculture (NeGP-A: राष्ट्रीय ई-गवर्नेंस): to enhance reach of extension services- about cropping methods, market prices etc. to the farmers.
 6. Sub-Mission on **Seeds and Planting** Material (SMSP: बीज तथा पौध रोपण सामग्री): to promote new technologies in seed production, processing, storage, certification and quality etc.
 7. Sub-Mission on Agricultural **Mechanisation** (SMAM: कृषि मशीनीकरण पर उपमिशन): To increase the availability of farm machines to small and marginal farmers. e.g. 'Custom Hiring Centres' where they can rent the machines without spending money on individual ownership. encourage R&D for small-sized machineries for small landholdings, hill-areas etc.
 8. Sub Mission on **Plant Protection** and Plan Quarantine (SMPPQ: पौध संरक्षण और पौधों के अलगाव पर उपमिशन): To minimize the damage by insect pests, diseases, weeds, rodents, etc. and to shield our agricultural biosecurity from alien species.



9. Integrated Scheme on Agriculture **Census, Economics** and Statistics (ISACES: कृषि गणना, अर्थव्यवस्थाएं तथा सांख्यिकी पर एकीकृत योजना): For data collection which can be used for R&D and policy making.
10. Integrated Scheme on **Agricultural Cooperation** (ISAC: कृषि सहयोग): Give financial assistance for farmers' cooperatives for agricultural marketing, processing, storage etc.
11. Integrated Scheme on **Agricultural Marketing** (ISAM: कृषि विपणन): To develop online and offline agricultural marketing infrastructure.

<**Homework?** After Prelims, self-study their features in a more comprehensive manner, because UPSC is in habit of asking about random obscure agro. schemes in the mains exam. E.g. horticulture mission.>

4.24.4 Agro Production & Processing → PM _____ Yojana

- Boss? Food Processing Ministry. Core Scheme = _____ funded by Union.
- Modi's PMKSY (प्रधान मंत्री किसान सम्पदा योजना) is an umbrella scheme incorporating previous Congressi schemes like Mega Food Parks, Integrated Cold Chain, modernization of reefer vans etc. Basically, funding is given to setup food processing infrastructure / parks / collection centres. E.g. Patanjali Food and Herbal Park at Haridwar, Uttarakhand.
- **Budget-2018** launched a new sub-scheme under PM Kisan Sampada Yojana called Operation Greens for T-O-P: Tomato, Onion and Potato.

Self-Study-for

- **Mains-GSM1:** Industrial location factors at mrunal.org/tag/gsm1-geo-location
- **Main-GSM3:** Food Processing Industry at mrunal.org/tag/food-processing

4.25 SECTORS → AGRO ALLIED: → ANIMAL HUSBANDRY (पशुपालन)

- **DPSP-Article __:** requires the State to organise animal husbandry on modern and scientific lines, preserving and improving breeds, and prohibiting the slaughter of cows and other cattle.
- India has the world's largest livestock population (Cattle > Goat > Buffalo > Sheep > Pig > Horses & Ponies > Camels > Donkeys).
- 1970-1996: Operation Flood in 3 phases, to setup dairy farmers' cooperatives → increase milk production in India.
- **Challenge?** Post-2017, there is crash in milk prices in global market due to excess supply. So, Indian private dairy owners also cut down their procurement prices, resulting in dairy farmers' distress & agitations where they spill milk on highways in protest.

4.26 AGRO ALLIED: ANIMAL HUSBANDRY → WHILE REVOLUTION

- **Boss?** Agro Ministry → Department of Animal Husbandry, Dairying & Fisheries.
- Core Scheme = _____ Funded by Union.
- It is an Umbrella scheme covering many Congressi schemes like Dairy Entrepreneurship Development, Livestock Census, National Livestock Mission, Schemes for fodder & vaccination etc.
- Notable parts of White revolution are →

Pashudhan Sanjivani	<ul style="list-style-type: none"> - Animal Wellness Programme with emergency helpline - Farmers given Nakul Swasthya Patra: An Animal Health card
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	with UID identification number of each animal registered in a National Database.
e-Pashudhan Haat portal	Online portal for for connecting farmers with breeders of indigenous bovine breeds so they can connect with each other for bulls, artificial insemination etc.
Rashtriya Gokul mission	<ul style="list-style-type: none"> - Indigenous bovine breeds (स्वदेशी गोजातीय नस्ल)- conserve them & increase their population. E.g. Gir, Sahiwal, Rath, Deoni, Tharparkar, Red Sindhi. - State govts are given money for establishing Gokul Gram breeding & disease treatment centres.
National Kamdhenu breeding centre	For development and conservation of indigenous breeds in a scientific manner. Two centres: 1) Itarsi near Hoshangabad in M.P. 2) Chintaladevi near Nellore in Andhra GK-NOTIMP.
----- ----- ----- 2019	<p>Int-Budget-2019 has setup this executive body in Agro Ministry with prominent social workers & scientists in cow-welfare field. Goals?</p> <ul style="list-style-type: none"> - Genetic up-gradation of cow resources - Enhance cow productivity through research in organic manure, biogas etc; Cow welfare, cow protection laws.

4.27 AGRO ALLIED: FISHERIES → BLUE REVOLUTION (मत्स्य → नीली क्रांति)

- **Boss** is same as White Revolution, This is also a core scheme.
- Government gives money for modernization of boats, marketing & cold storage infrastructure. National scheme for welfare of fishermen which gives money for construction of houses, tube wells for drinking water etc.
- Promote Inland fisheries, aquaculture & pisciculture i.e. raising fish in artificial tanks/ ponds.
- **Mariculture** = cultivation of marine organisms in their natural environment in sea upto 12 nautical miles from coast. Just like Agriculture, this is also a State-list subject. 2018: Agro Ministry announced Draft National Policy on Mariculture which encourages State Govts to lease the sea area to private entities & even farming of genetically modified species in enclosed / caged marine spaces.

Related?

- **“Pink Revolution”** for meat and poultry industry, under Ministry of food processing however not much in LimeLight under the Modi-government.
- Similarly, Yellow revolution in oilseed also not much limelight.

4.28 AGRICULTURE → RESEARCH DEVELOPMENT & EDUCATION

Indian Council of Agricultural Research (1929) is the apex body of agricultural research, education and extension under the ministry of agriculture. ICAR operates through 690 + Krishi Vigyan Kendra which provide last Mile connectivity to farmers and help them adopt the latest cropping technologies.

Challenges in Agro R&D? (Challenges in Agro)

1. ICAR scientists' **salary structures and promotion rules** are time-bound and seniority based. So highly intelligent scientists opt for private companies / foreign countries.
2. Presently agriculture research funding is <1% of GDP. We need to increase it.



3. Government scientists mainly focus on improving quantitative yields. If they also focused on aroma, taste, appearance, calorie, nutrient, antioxidants etc. from wealthy health-conscious urban/foreign consumers' point of view, then premium varieties can be created to help farmer earn more money. Because our goal is 2x farmer income, which doesn't necessitate 2x production.
4. Indian agriculture research has become '**cereal centric**'. We need to focus on pulses, oilseeds, horticulture and animal husbandry as well.
5. Even if research doesn't drastically improve the quantitative yield, but improves the shelf life of onions, potatoes, tomatoes etc. then also food inflation can be controlled by reducing seasonal variation in the supply.

Past Economic Survey & NITI reports observed: There is proliferation of self-financed private agri colleges without sufficient faculties, proper labs or infrastructure.

- Instead of creating more institutions, we should focus on quality of research and infrastructure in existing bodies.
- ICAR should have UGC like powers to regulate these private agro. Colleges.
- At least two agricultural universities should be given large grants so they can achieve global status.

4.29 AGRICULTURE → EXTENSION SERVICE (विस्तार-सेवा)

<for Mains GSM3>

- **Definition:** Extension service is an informal education process to offer advice, information and training, usually meant for farmers, villagers and women to change their outlook towards their agricultural / economic / health problems.
- **Challenge?** According to NSSO survey, ~60% of Indian farmers do not get much agricultural technical assistance from government-institutes. So they rely on progressive farmers, media, and private sellers of seeds, fertilizers, and pesticides- who may not give them unbiased advisory because of their own vested commercial interests.

Usually 5 delivery channels for agri-extension services:

Channel →	Challenges
Individual counseling via personal meeting, toll-free Helpline & Letters	Geographical each, manpower availability. Barely 1 extension worker available per 800-1000 farmers.
Group counseling via seminar, workshop, group discussion, field visit.	Farmers fear loss of workday, lack of motivation to spend time / travel.
Kurukshetra and other govt magazines / periodicals.	Illiteracy and poverty. then we've to use audio-visual methods such as....
Mass Media via Kisan TV (2014) and Public Radio broadcast.	Marginal farmers may not have instruments to watch them. Customized / tailor made advisory / information difficult to deliver.
E-Technology via E-Krishi (Webportal) ; mKisan (SMS/USSD), Kisan Suvidha App etc	Mass reach possible because more mobiles and jio4G effect. Tailor-made advisory can be given.

4.29.1 Agri-extension services → Timeline of schemes / events

- 1974: Kisan Vikas Kendras under ICAR started.
- 1998: Agriculture Technology Management Agencies (ATMAs) supported by ICAR.



- 2002: Agriclincs by private individuals -usually, agri. graduates. They receive funding from Agriculture Ministry.
- 2014 onwards: Modi launches Kisan TV, Kisan Suvidha App, mKisan portal etc. while ICAR launched
 - I. _____ → Attracting And Retaining Youth In Agriculture- For entrepreneurship in food processing chains.
 - II. _____ → Student Rural Entrepreneurship Awareness Development Yojana
 - III. Krishi Unnati Mela → Jointly by ICAR & Agro Ministry's other departments. 3rd edition @New Delhi in 2018.

4.30 AGRICULTURE-CONCLUSION

- ✓ Agriculture is the largest sector of Indian economy in terms of number of people employed. For their income security, as well as entire India's food & nutritional security, we've to focus on improving soil, irrigation, seed, fertilizers, market reforms etc. <insert name of x y z> scheme is important in that regard.
- ✓ And / or to double the farmers income, we've to focus on horticulture / floriculture / fisheries / animal husbandry / poultry / food processing / extension services and therefore addressing aforementioned <insert name of > challenges is need of the hour.

4.31 MAINS QUESTIONS FROM AGRICULTURE IN PREVIOUS UPSC EXAMS

Suggested reading?

- 1) Web-resources mentioned in this handout for Food processing and land reforms.
- 2) Introduction conclusions of past 3 years' economic surveys (usually their vol2 ch.7 deals with Agro).
- 3) Chief Editor's Desk (Preface) of last 2 years' Yojana & Kurukshetra magazines from http://yojana.gov.in/Recent_archive_2018.asp (change year number for getting previous Archives). **If a particular month's magazine issue is devoted to Agro → further go through index & refer to article inside it depending on exam requirement.**
- 4) NITI PDF Document: Strategy for New India @75 ch. 5, 6 and 7.

4.31.1 Mains Questions: Agro → Cropping & irrigation & Land Reforms

GSM3 Syllabus Topic: Major crops cropping patterns in various parts of the country, different types of irrigation and Land reforms in India.

Sikkim is the first 'Organic State' in India. What are the ecological and economical benefits of Organic State?	2018
Assess the role of National Horticulture Mission (NHM) in boosting the production, productivity and income of horticulture farms. How far has it succeeded in increasing the income of farmers?	2018
How has the emphasis on certain crops brought about changes in cropping patterns in recent past? Elaborate the emphasis on millets production and consumption.	2018
What are the major reasons for declining rice and wheat yield in the cropping system? How crop diversification is helpful to stabilize the yield of the crop in the system?	2017



What is water-use efficiency? Describe the role of micro-irrigation in increasing the water-use efficiency.	2016
What is allelopathy? Discuss its role in major cropping systems of irrigated agriculture.	2016
Given the vulnerability of Indian agriculture to vagaries of nature, discuss the need for crop insurance and bring out the salient features of the Pradhan Mantri Fasal Bima Yojana (PMFBY)	2016
Discuss the role of land reforms in agricultural development. Identify the factors that were responsible for the success of land reforms in India.	2016
Establish the relationship between land reform, agriculture productivity and elimination of poverty in Indian Economy. Discussion the difficulty in designing and implementation of the agriculture friendly land reforms in India.	2013

4.31.2 Mains Questions: Agro → E-Tech. in aid of farmers

GSM3 Syllabus Topic: e-technology to aid farmers, Technology missions;

Explain various types of revolutions, took place in Agriculture after Independence in India. How these revolutions have helped in poverty alleviation and food security in India?	2017
How can the 'Digital India' programme help farmers to improve farm productivity and income? What steps has the Government taken in this regards?	2015

4.31.3 Mains Questions: Agro → Food processing industry

GSM3 Syllabus Topic: Food processing and related industries in India (scope & significance, location, upstream-downstream requirements, supply chain management); storage, transport & marketing of agro-produce and related issues & constraints; Economics of animal-rearing

Examine the role of supermarkets in supply chain management of fruits, vegetables and food items. How do they eliminate number of intermediaries?	2018
What are the reasons for poor acceptance of cost effective small processing unit? How the food processing unit will be helpful to uplift the socio-economic status of poor farmers?	2017
Livestock rearing has a big potential for providing non-farm employment and income in rural areas. Discuss suggesting suitable measures to promote this sectors in India	2015
In view of the declining average size of land holdings in India which has made agriculture non-viable for a majority of farmers, should contract farming and land leasing be promoted in agriculture? Critically evaluate the pros and cons.	2015
What are the impediments in marketing and supply chain management in industry in India? Can e-commerce help in overcoming these bottlenecks?	2015



There is also a point of view that agriculture produce market committees (APMCs) set up under the state acts have not only impeded the development of agriculture but also have been the cause of food inflation in India. Critically examine.	2014
India needs to strengthen measures to promote the pink revolution in food industry for better nutrition and health. Critically elucidate the statement.	2013

4.31.4 Mains Questions: Agro → MSP

GSM3 Syllabus Topic: Farm subsidies and MSP and issues therein (direct and indirect);

PDS (objectives, functioning, limitations, revamping, issues of buffer stocks & food security)

What do you mean by Minimum Support Price (MSP)? How will MSP rescue the farmers from the low income trap?	2018
How do subsidies affect the cropping pattern, crop diversity and economy of farmers? What is the significance of crop insurance, minimum support price and food processing for small and marginal farmers?	2017
“In the villages itself no form of credit organisation will be suitable except the cooperative society.” – All Indian rural credit survey. Discuss this statement in the background of agriculture finance in India. What constraints and challenges do financial institutions supplying agricultural finances? How can technology be used to better reach and serve rural clients?	2014
Food security bill is expected to eliminate hunger and malnutrition in India. Critically discuss various apprehensions in its effective implementation along with the concerns it has generated in WTO.	2013
What are the different types of agriculture subsidies given to farmers at the national and state levels? Critically analyze the agriculture subsidy regime with the reference to the distortions created by it.	2013