

TOPICS & POINTERS

Exclusively For UPSC Mains 2022

AGRICULTURE GS-3 MAINS WORK BOOK



Mentoring and Enabling Through Intelligent Support System



TOPICS & POINTERS

ABOUT

The material aims to equip the aspirants with enough knowledge to attempt mains questions by incorporating various dimensions. This material will be provided every week as per the test module.

HOW TO READ THIS ?

- 1. Only key points will be provided .
- 2. Readers are advised to make a synopsis from topics and points given.
- 3. Make your own chart, diagrams and maps after reading the topics.
- 4. Understand the topics. Don't try to memorise them but link organically
- 5. Make sure to complete the module before the Test on Sunday.
- 6. Revise, Write, Practice- Repeat

MAINS ANSWER WRITING CHALLENGE

Starting from 13th of June till the end of the test schedule every day two questions will be posted and answers may be provided in the evening.



HEAD OFFICE : No.97, AF Block, 4th Avenue, 12th Main Rd. Shanthi Colony, Anna Nagar, Chennai - 600 040 © : 962636 4444 / 962636 9899

NELLAI BRANCH

No.1068, 3rd floor, Gilgal Complex, Trivandrum Road, Palayamkottai - 627002. © : 9626252500 / 9626253300 TRICHY BRANCH

No.143, 4th Floor, Lakshmi Complex, Salai Road, Thillai Nagar, Trichy - 620018, @ : 9751500300/ 9786500300

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2022- MAINS STUDY MODULE

AGRICULTURE

THEMES

- 1. Factors determining cropping pattern in India
- 2. Rice Wheat cropping system
- 3. Crop diversification
- 4. Emerging trends/technologies for cropping pattern in India

DEM

- 5. Millets production in India
- 6. Pulses production in India
- 7. Oilseeds production in India
- 8. Micro irrigation

Conservation Agriculture

- 9. Organic farming
- 10. Climate Smart Agriculture
- 11. Zero Budget Natural farming
- 12. Zero tillage
- 13. Permaculture
- 14. Vertical farming
- 15. Precision farming
- 16. System of Rice intensification
- 17. Process of Agricultural marketing
- 18. Problems of current agricultural marketing
- 19. Agricultural Produce Market Committee (APMC)
- 20. e-NAM Salient features and Benefits
- 21. Farmer Producer Organization (FPO)
- 22. Small Farmers Agribusiness Consortium (SFAC)
- 23. Contract farming
- 24. Crop Insurance in India
- 25. Agriculture subsidies
- 26. Minimum Support Price (MSP)
- 27. WTO and subsidies
- 28. Revolutions for food security and poverty alleviation
- 29. Public Distribution System (PDS)
- 30. Modernization of Targeted Public Distribution System (TPDS)
- 31. National Food security Act -2013
- 32. Economics of animal rearing
- 33. Integrated Farming System (IFS)
- 34. Food processing in India

2022- MAINS STUDY MODULE

Previous Year Questions Major Crops - Cropping Patterns in various parts of the country

- 1. 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?
- 2. How has the emphasis on certain crops brought about changes in cropping patterns in recent past? Elaborate the emphasis on millets production and consumption.
- 3. Sikkim is the first 'Organic State' in India. What are the ecological and noneconomic benefits of Organic State?
- 4. What are the major factors responsible for making rice-wheat system a success? In spite of the success how has this system become bane in India?

Different Types of Irrigation and Irrigation Systems

- 5. What is water-use efficiency? Describe the role of micro-irrigation in increasing the water-use efficiency
- 6. Elaborate the impact of National Watershed Project in increasing agricultural production from water-stressed areas.
- 7. Suggest measures to improve water storage and irrigation system to make its judicious use under depleting scenario.
- 8. How and to what extent would micro-irrigation help in solving India's water crisis?

Storage, Transport and Marketing of Agricultural Produce and Issues and Related Constraints

- 9. 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.
- 10. 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.
- 11. What are the main constraints in transport and marketing of agricultural produce in India?
- 12. 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)
- 13.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?

E-technology in the aid of farmers; Technology Missions

- 14. What is allelopathy? Discuss its role in major cropping systems of irrigated agriculture.
- 15. What are the present challenges before crop diversification? How do emerging technologies provide an opportunity for crop diversification?

16.How can the 'Digital India' programme help farmers to improve farm productivity and income? What steps has the Government taken in this regard?

Issues related to Direct and Indirect Farm Subsidies and Minimum Support Prices

- 17. 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.
- 18. "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 constrain and challenges do financial institutions supplying agricultural finances? How can technology be used to better reach and serve rural clients?
- 19. 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?
- 20.What do you mean by Minimum Support Price (MSP)? How will MSP rescue the farmers from the low-income trap?

Public Distribution System - Objectives, Functioning, Limitations, Revamping; Issues of Buffer Stocks and Food Security

- 21.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
- 22. 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?
- 23.What are the reformative steps taken by the government to make food grain distribution system more effective?
- 24. What are the salient features of the National Food Security Act, 2013? How has the Food Security Bill helped in eliminating hunger and malnutrition in India?

Economics of Animal-Rearing

- 25.India needs to strengthen measures to promote the pink revolution in food industry for better nutrition and health. Critically elucidate the statement.
- 26.Livestock rearing has a big potential for providing non-farm employment and income in rural areas. Discuss suggesting suitable measures to promote this sector in India.
- 27. How far is Integrated Farming System (IFS) helpful in sustaining agricultural production?

Food Processing and Related Industries in India- Scope' and Significance, Location, Upstream and Downstream Requirements, Supply Chain Management

28. What are the impediments in marketing and supply chain management in industry in India? Can e-commerce help in overcoming these bottlenecks?

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- 29. What are the reasons for poor acceptance of cost-effective small processing unit? How the food processing unit will be helpful to uplift the socioeconomic status of poor farmers?
- 30.Examine the role of supermarkets in supply chain management of fruits, vegetables and food items. How do they eliminate number of intermediaries?
- 31. What are the challenges and opportunities of food processing sector in the country? How can income of the farmers be substantially increased by encouraging food processing?

SWARAUMERUM

1.	Factors determining cropping pattern in India	
	 Physical factors: Climate: Dry regions where rainfall is low, millets like jowar and bajra; sugarcane is preferred in southern India due to warmer 	
	 Soil (topography, fertility, drainage): Tea and coffee mono- cropped in regions with high rainfall and well drained slopes; 	
	 Seed quality: Availability of good quality and HYV seeds shifting 	
	 Diseases: Forces farmers to avoid disease prone crops 	
	Economic factors:	
	- Price : Everts an influence on acreage shifts. Cash crops	
	 Changing consumption pattern: Rising nutritional awareness and increasing preference for healthier food like fruits, protein and millets. 	
	 Farm size: Small farmers go for subsistence farming while large farm owners go for profitable crops. 	
	- Availability of inputs like fertilizer, farm machinery and credit.	
	 Management techniques: Crop rotation and mixed cropping practices like intercropping, integrated farming etc. 	
	 Labour availability: Factors like migration, schemes like MNREGA affect the availability of labour. 	
	- Tenure : In crop sharing system, the landlord's choice is	
	dominant and it is often towards earning maximum profit.	
	 Involvement of private sector: Rise of contract farming; crops in demand are chosen. 	
	Intrastructure facilities:	
	Irrigation: When water is available throughout the year, double or even triple cropping is possible. Ex: Punjab and well-irrigated deltaic regions; Sardar Sarovar project can change the cropping pattern of the region which used to follow mono-cropping which is not a healthy practice.	
	 Transport: Better connectivity means better choices and better availability of backward and forward linkages. 	
	 Storage: Better storage facilities including cold chain storage. Encourages farmers to go for perishable crops 	
	 Market: Accessibility to markets so that the seller can find the best buyer and avoid distress sale. Ex: Density of APMC mandis 	
	 Processing: Presence of mills and other processing units. Ex: Sugarcane increasing in southern India. 	
	Policy factors:	
	- Legislative and administrative policies: National Food	
	Security Act, Food Crops Act, Land Use Act, Essential Commodities Act etc	
	 Loan waiver: Populist measures focusing on farmers who comprise of a huge vote bank. 	
	 MSP: Only specific crops are covered. 	

	—	Green Revolution : Specifically pushed farmers towards wheat and rice. Also skewed pattern across the nation since only a few	
		regions were targeted.	
	_	MNREGA: 100 days of wages means lesser incentive to till	
		during lean seasons.	
	Socia	l factors:	
		Food habits: For ex, North Indians prefer wheat while Eastern	
		and South Indians prefer rice. Differences in cooking oil too.	
2.	Rice ·	– Wheat cropping system	
	Regio	ons & factors	
	-	MSP : Assured income has prompted farmers to develop the	
		system and not worry about low prices.	
	_	Input subsidies like on land, water and freebies like electricity.	
	_	Green Revolution: Availability of HYV seeds offering higher	
		yield than any other crop.	
	_	Fertilizer and irrigation availability: Led to increase in area of	
		cultivation. Output per acre also grew.	
	_	Regions chosen and their social background: Regions like	
		Punjab, Haryana and parts of Western UP and TN. Wheat being	
		the staple food crop of northern India while it is rice for southern	
		India – core food preferences.	
	—	High cropping intensity offers higher productivity and in turn	
		better income.	
	—	Green fodder is produced which can support large livestock	
	-	populations.	
	Curre	ent issues & challenges:	
	_	Mono-cropping : Risk of crop failure due to climate or disease; hinders the idea of crop diversification.	
	—	Decrease in cash crops: Some farmers are unable to go for	
		crops beyond their own subsistence needs - plateauing of income & productivity.	
	—	Fiscal challenge: shift of consumer in the recent times but rice	
		and wheat production has more than doubled since 2006 – supply demand mismatch.	
	—	Yield is dependent on climatic factors – not climate resilient.	
	_	Environmental problems : Rice fields - methane generation (global warming); rice stubble burning; loss of biodiversity due to HVV seeds: ground water exploitation	
	_	Hidden hunger : Rice and wheat aren't enough to provide a	
		holistic nutrition and lack in several micro-nutrients unlike millets.	
	Орро	rtunities for increasing productivity	
	_	Cornerstone of securing India's food security.	
	—	Social reasons : Two crops still remaining as staple food of most Indians.	
	_	Global factors like Ukraine crisis has led to wheat shortage –	
		starving economies are looking for alternative options other than Ukraine and Russia	
	_	Food processing : Newer opportunities including higher export	
		possibilities.	
	Way f	forward:	
	_	Alternative to wheat-rice system.	
	_	Stronger backward and forward linkages for other crops.	

	Inclusive Ever Green Revolution as a core pillar of sustainable	
	development.	
3.	Crop diversification	
	Crop diversification refers to the addition of new crops or cropping systems to agricultural production on a particular farm taking into account the different returns from value-added crops with complementary marketing opportunities.	
	Types & features:	
	 Crop rotation: Will increase production; including legumes will help in nitrogen fixation; suppresses disease spread. Mixed farming: Insurance against failure of one crop; 	
	suppresses diseases; climate change buffer.	
	- Genetic diversification in monoculture : Increased production, stability and better.	
	 Agro-forestry: Trees along with crops – added income Integrated farming (including livestock): Ex- rice-fish cropping added income, more natural. 	
	 Micro-watershed-based diversification: Integration of crops with other farming components for year-round income and employment. 	
	Need for diversification:	
	 Risk of crop failure – due to disease as well as climate 	
	 Livestock population in India: Need to be included. 	
	 Ever growing need for sustainable development. 	
	 Climate change and biodiversity loss related risks need to be mitigated. 	
	 Need to sustain a huge and growing population. 	
	Benefits of diversification:	
	- Increases farmer's income	
	 Increases natural biodiversity and productivity 	
	 Reduces risk of total crop failure 	
	- Food security	
	 Improves economy by accessing different markets 	
	– Helps in price risk management	
	- Conservation of certain crop species as well as techniques such	
	as muoducing reguines in crop rotation.	
	Challenges:	
	 Most parts of the country are still rain-fed. 	
	 Inadequate supply of seeds for most crops and lack of subsidies like MSP. 	
	 Fragmentation of land forcing monoculture 	
	 Poor investment in agri sector 	
	 Lack of awareness, knowledge and training. 	
	Govt policies:	
	- Technology Mission for Integrated Development of Horticulture	
	in Northeast Region: Providing missing links	

	_	National Agriculture Insurance Scheme: to cover food crops,	
		oilseeds and horticulture	
	_	Sub-Mission on Agro-forestry scheme	
	-	Mega Food Parks: Incentivises crop diversification.	l
	-	Pradhan Mantri Fasal Bima Yojna	
	Eme	rging trends/technologies for cropping pattern in India	
	Intro		
	_	We need new and resilient techniques like Aquaponics and	
	_	urban farming	
	Rece	nt Use of Tech:	
	_	Zero till cultivation of wheat is being demonstrated in upper	
		and mid gangetic regions by IARI, New Delhi \rightarrow Significant	
		savings on tillage, higher benefit cost ratio	
	_	Heat tolerant rice genotypes for north eastern region	
	—	"Design of Micro Irrigation Systems (DOMIS)" is presented to	
		help the user to design appropriate micro irrigation systems for	
		efficient water utilization under different agro-climatic	
		conditions for any crop under different sources of water	
		availability	
	_	the productivity of wheet and acubeen eren over in adverse	
		alimetia conditiona)	
		Tractor drawn nneumatic precision planter (quitable for	
	_	precise planting of single seed at predetermined seed /row	
		spacing	
	_	Tractor drawn vegetable transplanter (suitable for	
	_	transplanting of tomato, chilli, cabbage, cauliflower and brinial	
		crops)	
l	_	Millet m ill (for dehulling small millets like foxtail millet little	
l		millet kodo millet proso millet and barnyard millets)	
	_	Micronronagation Technology etc	
		micropropugation reemongy ene	l
	Role	of Emerging New Technology and Agri:	
	Indoo	or Vertical Farming	
	_	sustainable urban growth, 70% less water, controlled variables, Less	
		labor	
	Auto	mation And Robotics	
		Smart farming drones autonomous tractors robotic harvesters	
		automatic watering and seeding robots	l
	Lives	tock Technology	
		Nutritional technologies genetics digital technology- concept of the	
		'connected cow'eg: Pashu Aadhaar \rightarrow Sensors to identify sick	
		opimala	
	Mode	annnais Arn Greenhause Bractices	
	mode	Shifting form Descends to Longe costs conversion for itities. Marture	
	_	Shifting form Research to Large scale commercial facilities-Modern	
		greenhouses are becoming increasingly tech-heavy, using LED lights	
	_	and automated control systems	
1	Preci	sion Agriculture and Artificial Intelligence	
	_	GPS, drones, and satellite images. Based on this data, farmers	
		receive information on all key issues: crop status, weather	
		torecasts, environmental changes, etc—Zone based Agri	
			1

Diochemann.			
– Blockcha	in's capability of tra	acking ownership	records and
tamper-resistance can be used to solve urgent issues such as			
food fraud, safety recalls, supply chain inefficiency and food			
traceability in the current food system			
- Governm	ent of India spearh	eaded the United I	Nations General
Assembly	(UNGA) resolution	for declaring 202	3 as
Internat	ional Year of Mille	ts.	
- India is r	now the 5th largest	exporter of millets	globally. Nearly
41% of t	otal global produc	tion was met by I	ndia in 2020.
- India ma	jor export destination	ons are Nepal, UA	E, Saudi Arabia,
Libya, Ti Millota a	inisia, Morocco, the	UK, Yemen, Oma	n, and Algeria.
- Millets a Karnatal	a Andhra Pradesh	Tamil Nadu Ker	ala Telangana
Uttarakh	and, Jharkhand, M	adhva Pradesh, a	nd Harvana.
		j ,	
Millet	s: an approach for sustaina	ble agriculture and heal	thy world
	¥	¥	¥
FoodSecurity	Nutritional Security	Safety from diseases	Economic security
 Sustainable food 	Rich in	Gluten free: a	Climate resilient crop
source for combatin	g micronutrients like	substitute for wheat	Sustainable income
hunger in changing	calcium, iron, zinc,	in celiac diseases	source for farmers
World climate Desistant to climatic	Dich in bioactive	Low GI: a good lood for diabetic persons	 Low investment needed for production
stress, pests and	compounds	Can help to combat	Value addition can
	Better amino acid	cardiovascular	lead to economic
diseases	Dener animo acia		
diseases	profile	diseases, anaemia,	gains
diseases	profile	diseases, anaemia, calcium deficiency	gains
diseases	profile	diseases, anaemia, calcium deficiency etc.	gains
diseases	profile	diseases, anaemia, calcium deficiency etc.	gains
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	- NITI Aayog signed a Statement of Intent (SoI) with United Nations World Food Program (WFP) on 20 December 2021. The partnership focuses on mainstreaming of millets and supporting India in taking lead globally in knowledge exchange.	
6.	Pulses production in India	
	 India's pulses production -> increased significantly in the last few years & dependences on pulses import reduced. MSP of pulses -> increased from 40% to 73% in 6 years. Output has increased to 240 lakh tonnes (from 140 lakh tonnes) in 6 years -> because of the efforts made by farmers, scientists & government's initiative. India currently produces 25 percent of the world's pulses 	
	 Per capita availability of pulses -> reached 55.9 gram/day, as against ICMR recommendation of 52 gram/day pulse requirement. 	
	Advantages of pulse production:	
	 Pulses/legumes are rich in nutritional/protein values -> important part of a healthy diet -> contribute to achieving 2030 Agenda of Sustainable Development. 	
	 Plays a critical role in marking challenges of poverty, food chain security, degraded health & climate change. It is highly water efficient & climate resilient crop. 	
	 It helps in soil fertility by fixing nitrogen & promoting soil microbes. 	
	Constrains:	
	 Pulses production in India -> marred by absence of high-yielding varieties & pests/diseases resistant, low level of mechanization, lack of assured market, ineffective government procurement, unfavourable prices & trade liberalization -> make pulse production less attractive for farmers. Lack of serious attempt to use advanced technology in 	
	harvesters & threshing machines.	
	 Pulses in India -> mostly grown in rain-fed areas -> increases the risk of crop failure. 	
	 Poor access to storage & milling facilities causes further risk to farmers. Poor market linkages -> cause constraints in meeting market demand. 	
	 Government efforts to increase production of Pulses 150 Seed Hubs created at ICAR institutes, State Agriculture Universities (SAUs) and Krishi Vigyan Kendras (KVKs) for increasing certified seeds production of pulses. Distribution of seed mini-kits of pulses free of cost to the farmers of the varieties notified within 10 years. Assistance is provided to Central Seed Agencies to produce partified and of latest available. 	

	- A new scheme "Intercropping of pulses with sugarcane" was	
	implemented in 12 States namely- Bihar Gujarat Harvana	
	Karnataka Madhya Pradesh Maharashtra Odisha Punjah	
	Tamil Nadu Telangana Uttar Pradesh and Uttarakhand during	
	201819 and 2019-20	
	- Launched Targeting Rice fallow Area (TRFA) programme	
	under NFSM in 11 states	
	To improve availability and stabilise prices of pulses, the	
	Government has allowed the import of Tur. Urad and Moong	
	under Tree cotegory we f May 15, 2021 till October 31, 2021	
	in order to ensure smooth and seemless imports	
	Under Price Stabilization Fund (DSF) the Covernment has	
	- Onder Frice Stabilization Fund (FSF) the Government has	
	financial year 2020 21 to 22 LMT in the financial year 2021	
	infancial year 2020-21 to 25 LMT in the infancial year 2021-	
-	22.	_
7.		
	India holds a significant share in world oil seed production. Oilseeds	
	besteres mainly on marring lands, of which 70% is confined to	
	rectares manny on marginariands, or which 72% is commed to	
	About Oilacada	
	About Oliseeds	
	- Onseed crops are the second most important determinant of the	
	field groups	
	Despite being the fifth largest eilessed even meducing sourters	
	- Despite being the fifth largest onseed crop producing country	
	waretable oile today	
	India huve more than two thirds of its total edible oil imports	
	as palm oil	
	- After China India is the second largest producer of groundnut	
	and is third in position in the production of Raneseed after China	
	and is time in position in the production of Rapeseed after official	
	- Four main concerns for oil seed and oil producers in India are:	
	 Lack of Micro-irrigation Infrastructure 	
	 Non availability of quality seeds 	
	 Lack of marketing infrastructure and 	
	Government policies	
	Stens to increase Edible Oil Production in India:	
	- The government has also launched the Kharif Strategy 2021	
	for oilseeds.	
	 It will bring an additional 6.37 lakh hectare area under oilseeds 	
	and is likely to produce 120.26 lakh quintals of oilseeds and	
	edible oil amounting to 24.36 lakh quintals.	
	National Edible Oil Mission-Oil Palm (NMEO-OP):	
	- Government has announced the National Edible Oil Mission-Oil	
	Palm (NMEO-OP) scheme for self-reliance in edible oil and	
	involves investment of over Rs. 11,000 crore (over a five year	
	period).	
	Way Forward:	
	– The government should approve Genetically Modified	
	cultivation for oil seeds to increase production.	
	 there must be a micro-level plan with technological support. 	

	The measures to increase our oilseed production and reduce import	
	Dills are:	
	- Farm-level measures	
	1. Targeted focus based on the agro-climatic conditions	
	and incentivisation of farmers to cultivate the suitable	
	crop of region.	
	2. Large scale adoption of agro-ecological methods like	
	System of Crop Intensification, Relay Cropping is	
	needed.	
	 Policy-level measures 	
	1. Policies and missions like NMOOP, ISOPOM to	
	incentivise the very cultivation of oilseeds on a per hectare	
	basis.	
	2. Provide incentives to private sector participation in	
	processing and value addition in oilseed crops.	
	Conclusion:	
	– With growing population and increasing disposable income, the	
	demand for oil will increase. Public funds should be spent on	
	lasting solutions for India's edible oil crisis.	
0	Migro Irrigation	
0.	Micro Infigation	
	micro-inigation system is a modern method of inigation. Micro-	
	inigation system has become popular these days for its low cost and	
	water-enciency.	
	Types	
	There are majorly 5 types of micro irrigation system. They are Drip	
	irrigation, Sprinkler irrigation Spray irrigation, Subsurface irrigation,	
	and Bubbler irrigation.	
	Significance	
	- Micro-irrigation ensures water use efficiency as much as 50-	
	90%.	
	 Water savings in comparison with flood irrigation are to the tune 	
	of 30-50%, with an average of 32.3%.	
	 Electricity consumption falls significantly. 	
	 Adoption of micro-irrigation results in savings on fertilizers. 	
	- Increase in the average productivity of fruits and vegetables.	
	- It leads to overall enhancement of farmers' income	
	Present status	
	- The average penetration of micro irrigation in India is 19% (as	
	on February 2021) which is much lesser than many countries	
	27 states in India have less than 30% micro irrigation system	
	- 27 states in india nave less than 50% intero inigation system	
	Generamenta initiatives for micro irrigation	
	Notional Mission On Mission (NMMI) and National	
	- National Mission On Micro Irrigation (NMMI) and National	
	wission for sustainable Agriculture (NMSA) were launched	
	with a clear mission to promote micro irrigation systems.	
	- Fradhan Mantri Kisan Sinchai Yojana to solve this problem.	
	water conservation and increasing water use efficiency. Under	
	this scheme small farmers will be paid 55% subsidy to install	
	micro irrigation systems.	
	Disadvantages/Challenges	
	 High initial investment 	

	- It's usually affected by climatic conditions, water sources, and	
	 When operating at high temperatures, water can evaporate at a 	
	fast rate degrading the effectiveness of the irrigation.	
	- It depends on a clean source of water and therefore may not be	
	suited to areas where rainfall and groundwater sources are	
	Non availability of uninterrupted electric power.	
9.	Organic farming	
	 Food safety => major concern & necessity. 	
	– Extensive usage of chemical fertilizers & pesticides ->	
	impediment to maintain a proper health.	
	- Organic farming -> opens up a sustainable doorway to prevent	
	various health hazards originating from agro-based products.	
	- According to FSSAI => 'Organic farming' is a system of farm	
	design & management to create an ecosystem of agriculture	
	chemical fertilizera pesticidea & synthetic hormones or	
	genetically modified organisms	
	Organic Farming in India	
	 India ranked 1st -> in number of organic farmers; 5th -> in terms 	
	of certified organic area; 8th in the world's total organic	
	agricultural land.	
	– 51% increase in the production of organic products in 2020-21.	
	 Sikkim -> only state -> fully organic (so far) 	
	– North East India, tribal & island territories -> traditionally	
	organic.	
	Important Government Initiatives	
	- Paramparagat Krisni vikas Yojana -> promotes cluster based organic farming.	
	- Rashtriya Krishi Vikas Yojana -> assistance for promotion of	
	- Food Safety and Standards Authority of India (FSCAT)	
	responsible for regulating organic food in domestic market &	
	imports.	
	Benefits of organic farming:	
	- Better Taste & More Nutrition => given much longer time to	
	develop & not pumped with artificial things.	
	- Reduces pesticide & chemical residue in soil -> ensures health	
	of soil, water, air, flora & fauna.	
	 Crop rotation to build soil fertility & raising animals -> naturally 	
	promotes biodiversity.	
	- Consumes less energy -> because manufacturing of synthetic	
	Iertilizers consumes significant energy.	
	- lakes proactive/preventative approach -> helps for long-term	
	 Reduced erosion & better water management 	

	- Familiarity with the techniques => t	farmers can easily
	understand & adapt to the techniques of	organic farming that
	deploys traditional knowledge.	
	Challenges in Organic Farming	
	- Not sure whether all the nutrients with rec	quired quantities can
	be made available by organic materials -> S	Shortage of Biomass.
	- Disparity of Supply and Demand -> non-p	perishable grains can
	be grown anywhere and transported to any	y location -> but this
	is not the case with fruits/vegetables.	
	- Requires more time because of greater in	nteraction between a
	farmer & crop for observation, timely i	ntervention & weed
	control.	
	– High MRP.	1 . 1 1
	- Marketing of organic produce -> not proper	rly streamlined.
	way Forward	
	- Upgrading of technology & empowering reso	earch in agriculture -
	> impetus to organic farming.	
	- Assure income generation & reduced dep	endence on external
	products.	a contain los actina
	- integrating the natural way in larining	g system by active
	internationa	linty & government
	Creater awaranasa & canacity buildin	a of producers in
	- Greater awareness & capacity building	g of producers in
	Agricultural universities need to focus	more en ergenie ⁸
	natural farming -> promote inpovation & ac	more on organic &
10.	Climate Smart Agriculture	
10.	Introduction	
	- Climate-Smart Agriculture (CSA) is an a	pproach to help the
	people who manage agricultural systems r	respond effectively to
	climate change.	
	 CSA => developing agricultural strategies t 	to secure sustainable
	food security under climate change -> adap	otation is the key.
	3 objectives:	
	 Sustainably through increasing productivit 	ty & incomes
	 Adapting to climate change 	
	 Reducing greenhouse gas emissions 	
	Need for CSA	
	– Higher temperatures, changes in precipita	ation patterns, rising
	sea levels & more frequent/extreme weath	ner events -> risk for
	agriculture, food & water supplies.	
	– SDGs (1 & 2) -> envision a world with zero	hunger.
	– Food supply needs to grow by 60% from 20	006 levels by 2030 ->
	to satisfy the demand for food -> require h	higher yields but with
	limited acreage.	
	– Helps farmers to adapt & mitigate climate of	change.

	Benefits	
	- CSA provides the means to help stakeholders from local to	
	national/international levels -> identify agricultural strategies	
	suitable to their local conditions.	
	 In line with FAO's vision for Sustainable Food and Agriculture & 	
	supports FAO's goal to make agriculture, forestry and fisheries -	
	> more productive & sustainable.	
	 Promotes innovative/adaptive farming communities -> working 	
	towards restoring & conserving soil health.	
	– It includes practices like farm ponds, bunding, trenching,	
	mulching etc> for conservation of soil moisture.	
	- Will use land & water optimally, judicial seed selection & adapt	
	to uncertain weather conditions.	
	Disadvantages:	
	 Smart agriculture needs continuous/faster availability of 	
	internet.	
	- Smart farming based equipment require farmers to understand	
	& learn the use of technology -> major challenge in adopting at	
	large scale.	
	Way Forward	
	 Support farmers (technically & financially). 	
	– Multilateral lending institutions (Ex: World Bank, ADB) ->	
	important role in directing funding.	
	- Private sector too must be made a partner in implementation	
	schemes.	
	- Global partnerships and knowledge sharing are critical pillars of	
	the mitigation strategy.	
	Global Alliance for Climate Smart Agriculture (GA-CSA) will be a	
	key player in propagating policies & action plans for CSA	
	adaptation.	
11.	Zero Budget Natural farming	
	– ZBNF => chemical-free agriculture -> from traditional	
	Indian practices (primarily relies on Agro-ecology).	
	- Alternative to Green Revolution methods driven by	
	chemical fertilizers, pesticides & intensive irrigation.	
	 Almost 70% of agricultural households -> spend more than 	
	they earn; more than 50% of all farmers are in debt -	
	National Sample Survey Office (NSSO) data.	
	- External input costs -> leading cause of indebtedness &	
	suicide among farmers => suggested "zero budget" exercise	
	-> to break the debt cycle.	
	ZBNF is based on 4 pillars:	
	 Jiwamrita -> fermented mixture of cow dung & urine. 	
	- Bijamrita -> seed treatment technique from locally available	
	ingredients including desi cow dung & urine.	

	Mulabing > spreading a layer of material around plants to	
—	Mulching -> spreading a layer of material around plants to	
	protect their roots from heat/cold/drought or to keep the fruit	
	clean.	
_	Waaphasa -> building up of soil humus to increase soil aeration.	
Advar	ntages of ZBNF	
_	Promotes soil aeration, minimal watering, intercropping ->	
	discourages intensive irrigation & deep ploughing.	
_	Social & environmental programme => ensure small farming	
	economically viable -> by enhancing farm biodiversity &	
	ecosystem services	
	Cost of forming is reduced income increases & restores	
_	Cost of farming is reduced, income increases & restores	
	ecosystem health through diverse/multi-layered cropping	
	systems.	
—	Cow dung has beneficial micro-organisms which decompose	
	dried biomass & convert into nutrients -> revives fertility &	
	nutrient value of soil.	
_	ZBNF requires only 10% water & 10% electricity than	
	chemical/organic farming.	
_	Reduce leaching of nitrogen & phosphorous from soil to	
	groundwater	
Issue	s Related to ZBNF	
10040	Many formers reverted to conventional forming after 7BNF's	
—	native drop often few woors (Example: Silvin) > reises	
	leculi diop alter lew years (Example, Sikkiii) -> raises	
	doubts about its efficacy in increasing farmers incomes.	
—	India needed Green Revolution to become self-sufficient &	
	ensure food security -> wholesale move away without	
	sufficient proof about yields would be a disaster => National	
	Academy of Agricultural Sciences -> warned against	
	promoting ZBNF.	
_	Cost of labour for collection of dung/urine & other inputs.	
_	ZBNF demands an Indian breed cow, whose numbers	
	are declining at a faster pace. => country's total population of	
	indigenous & non-descript cattle has dropped by 8.1% -	
	Livestock Census.	
_	If ZBNF practiced in isolation, crop grown would be vulnerable	
	to insect/nest attacks	
	Covernment anonda more for the Green Povelution schemes	
—	then the encodie forming schemes	
	than the organic farming schemes.	
_	Recently, Sri Lanka government banned agrochemical fertilizers,	
	to switch to 100% organic agriculture -> failed to maintain the	
	same level of yield -> food shortage/crisis, increase in food	
	prices.	
Way I	Forward	
—	Structural marketing issues needs to be addressed.	
_	Government should step in & reduce dependence on middle-	
	men.	

		Andhra Dradach amarianas > suggests the need for multi-	
	_	Andhra Pradesh experience -> suggests the need for public	
		runding.	
	—	Paradigm of chemical-based agriculture has failed	
		& regenerative agriculture is the emerging new science.	
		Farmers' ease of doing business & ease of living should also be	
		considered -> to make doubling of farmers' income a reality.	
12.	Zero	tillage	
	—	Zero tilling farming/no-tillage/direct drilling is an agricultural	
		technique for growing crops or pasture without disturbing the	
		soil through tillage.	
	31	pasic methods of zero tillage farming.	
	—	" Sod seeding " => crops are sown with seeding machinery into a	
		sod produced by applying herbicides on a cover crop (killing that	
		vegetation).	
	—	"Direct seeding" => crops are sown through the residue of	
		previous crop.	
	_	" Surface seeding " => crops are left on the surface of the soil; on	
		flats lands -> requires no machinery & minimal labour.	
	Benef	iits:	
	_	Soil structure stay intact -> decreases soil erosion.	
	_	Increases -> water infiltration into soil, soil retention of organic	
		matter & nutrient cycling.	
	_	Reduction in the cost of inputs for land preparation (saves	
		around 80%)	
	_	Dry matter & organic matter \rightarrow added to the soil	
		Greenhouse effect reduced due to carbon sequestration	
	_	Environmentelly cofe	
	Chal		
	Cilai	Former last the ability to mechanically control woods through	
	-	tillage.	
	_	Risk of carrying over plant diseases when crop residue is not	
		incorporated into the soil after harvest -> can act as a host for	
		disease & infect the following crop.	
	_	They require proper timing. If the terrains are dry enough ->	
		residues should be removed 1 to 2 weeks before. If the terrains	
		are wet -> should be done right before planting.	
	Conc	usion:	
		No-till farming -> promising concept in terms of money spent vs	
		gained. Beneficial to the environment, eliminating the negative	
		impact of farming activities on the environment, climate &	
		earth's overall health.	
13.	Perm	aculture	
	_	'Permaculture' -> permanent agriculture or permanent culture	
		-> aims to create sustainable human habitats by following	
		nature patterns.	
	_	An ethical design system applicable to food production, land use	
		& community building.	

		change mitigation & animal habitat -> helps in maximizing	
		biodiversity & preserving wildlife by creating more habitat for	
		animal species.	
	_ T i	Helps in saving space with intensive output.	
	Limit	ations	
	_	costly, since it requires adjustments in agricultural processes/infrastructure.	
	_	Permaculture leads to short-term losses & long-term benefits ->	
		resulting in problems for farmers.	
	_	May not be suitable & sustainable for mass production.	
	_	Requires plenty of work to be done & use of fewer machines ->	
		time-intensive.	
	Conc	Lack of knowledge among farmers regarding permaculture.	
	Conc	Although permaculture may not be a short-term solution for all	
		the problems the farmers face, the long-term benefits offered by	
		permaculture may help human society in building a sustainable	
		farming technique for themselves.	
14.	Verti	cal farming	
	_	Vertical farming is the practice of growing crops indoors , on	
		vertically inclined surfaces, under artificial conditions of light &	
		temperature.	
	_	It is done in a controlled environment, with the aim of optimising	
		plant growth.	
	_	it aims at higher productivity in smaller spaces & uses soil-less methods such as hydropopics, aquapopics & aeropopics	
	۵dva	ntages.	
	Auva	Increased crop yield & smaller unit area of land requirement ->	
		over 10 times the cron vield/acre than traditional methods	
	_	Crops are resistant to weather disruptions because of their	
		placement indoors -> less crops are lost to extreme /unexpected	

	—	Because of its limited land usage -> vertical farming is less	
		disruptive to the native plants & animals. Traditional farming is	
		often invasive to the native flora & fauna because it requires	
		large area of arable land.	
	_	Helps in preventing climate change & conserve the environment.	
	—	Produce crops with 70-95% less water than required for normal	
		cultivation. Transpiration -> will be harnessed & reused for	
		irrigation.	
	Disad	vantages:	
	_	Depends heavily on modern engineering, architecture & different	
		technologies. Expensive investment & operational costs.	
	_	Vertical farming in a controlled environment without the	
		presence of insects => needs manual pollination process ->	
		labour intensive & costly.	
	_	Labor Costs: In vertical farming, labor costs can be even higher	
		due to their concentration in urban centres where wages are	
		higher, as well as the need for more skilled labor . Automation	
		in vertical farms, however, may lead to the need for fewer	
		workers.	
	_	Potential for disrupting the rural sector -> farmers with no	
		competencies in vertical farming left jobless.	
	Conc	usion	
		By 2050, around 80% of world population is expected to live in	
		urban areas & growing population -> increase demand for food.	
		Efficient use of vertical farming -> play a significant role in	
		preparing for such a challenge.	
15.	Preci	sion farming	
	—	Precision agriculture -> where inputs are utilised in precise	
		amounts to get increased average vields, compared to traditional l	
		autorito to Set mercuoa avenago grenas, compared to traditional	
		cultivation techniques such as agroforestry, intercropping, crop	
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	Challenges:	
	– High cost	
	 Lack of technical expertise knowledge and technology 	
	 Not applicable or difficult/costly for small land holdings 	
	Heterogeneity of cropping systems and market imperfections	
16.	System of Rice intensification	
	- SRI involves cultivating rice with as much organic manure as	
	possible, starting with young seedlings planted singly at wider	
	spacing in a square pattern; and with intermittent irrigation that	
	keeps the soil moist but not inundated, and frequent inter	
	cultivation with weeder that actively aerates the soil.	
	 SRI is not a standardised, fixed technological method. 	
	- It is rather a set of ideas , a methodology for comprehensively	
	managing and conserving resources by changing the way that	
	land, seeds, water, nutrients, and human labour are used to	
	increase productivity from a small but well-tended number of	
	seeds.	
	Benefits of SRI	
	 Higher yields – Both grain & straw 	
	 Reduced duration (by 10 days) 	
	 Lesser chemical inputs & water requirement 	
	 Grain weight increased without change in grain size 	
	 Higher head rice recovery 	
	 Withstand cyclonic gales & Cold tolerance 	
	 Soil health improves through biological activity 	
	Disadvantages	
	 Higher labour costs in the initial years => needs 50% more man- 	
	days for transplanting & weeding -> Once the right skills are	
	learnt & implemented -> labour costs will be lesser.	
	 Difficulties in acquiring the necessary skills. 	
	Not suitable when no irrigation source available.	
17.	Process of Agricultural marketing	
	The process of agricultural marketing begins with the farmer and end	
	find many intermediaries like transporters, warehouse owners	
	commission agents, wholesalers, retailers etc. performing their duties	
	to enable the agricultural marketing process to reach its completion.	
	Agricultural marketing process involves wide variety of functions	
	such as:	
	(i) Assembling	
	(11) Grading and standardization (iii) Processing and Storage	
	(iii) Transportation	
	(v) Wholesaling and retailing	



		1
	- A large number of intermediaries exist between the cultivator and the consumer. All these middlemen and dalals claim a good	
	allouit of margin and thus reduce the returns of the cultivators.	
	0. Unregulated market s.	
	- There are huge number of unregulated markets which adopt various malpractices. Prevalence of false weights and measures and lack of grading and standardization of products in village markets in India are always going against the interest of	
	ignorant, small and poor farmers.	
	7. Lack of Market Intelligence:	
	- There is absence of market intelligence or information system in	
	India. Indian farmers are not aware of the ruling prices of their	
	produce prevailing in big markets. Thus, they have to accept any	
	un-remunerative price for their produce as offered by traders or middlemen	
	8 Lack of Organisation:	
	- There is lack of collective organisation on the part of Indian	
	farmers A very small amount of marketable surplus is being	
	brought to the markets by a huge number of small farmers	
	leading to a high transportation cost	
	9 Lack of Grading.	
	- Indian farmers do not give importance to grading of their	
	produce. They hesitate to separate the qualitatively good crops	
	from bad crops. Therefore, they fail to fetch a good price of their	
	quality product.	
	10. Lack of Institutional Finance:	
	- In the absence of adequate institutional finance, Indian farmers	
	have to come under the clutches of traders and moneylenders	
	for taking loan. After harvest they have to sell their produce to	
	those moneylenders at unfavourable terms.	
	V	
19.	Agricultural Produce Market Committee (APMC)	
	Intro:	
	– Agricultural Produce Marketing Committee (APMC) Act	
	authorizes the concerned State Governments to notify the	
	commodities, designate markets and market areas	
	Objectives	
	 Developing an efficient marketing system. 	
	 Promotion of Agri-processing and agricultural exports. 	
	– Specify procedures and systems to establish an effective	
	infrastructure for the marketing of agricultural produce.	
	Model APMC Act 2003 – Salient features:	
	- As per the act, the State is divided into several market areas,	
	each of which is administered by a separate Agricultural Produce	
	Market Committee (APMC) which impose its own marketing	
	regulation (including fees).	
	– Apart from that, legal persons, growers, and local authorities are	
	permitted to apply for the establishment of new markets for	
	agricultural produce in any area.	
	– No compulsion on the growers to sell their produce through	
	existing markets administered by the Agricultural Produce	
	Market Committee (APMC).	

	-	Separate provision is made for notification of 'Special Markets'	
		in any market area for specified agricultural commodities.	
	—	Provision for Contract Farming, allowing direct sale of farm	
		produce to contract farming sponsor from farmer's field.	
	—	Single point levy of market fee on the sale of notified agricultural	
		commodities in any market area.	
	_	Provision made for resolving disputes arising between private	
		market/ consumer market and Market.	
	—	Provides for the creation of marketing infrastructure from the	
	Chall	enges in Current APMC system:	
		Mononaly of APMC - It deprives farmers from better customers	
		and consumers from original suppliers	
	_	Cartelization	
	_	Entry Barriers – License fee in these markets is highly	
		prohibitive.	
	_	High commission. taxes and levies – Farmers have to pay	
		commission, marketing fee, APMC cess which pushes up costs.	
	Conc	lusion:	
	_	Model Agriculture Produce and Livestock Marketing Act-2017	
		APLM act needs to be adopted.	
20.	e-NAI	M – Salient features and benefits	
	—	E-NAM (National Agriculture Market) is an online trading	
		platform for agriculture produce aiming to help farmers, traders,	
		and buyers with online trading and getting a better price by	
	0	smooth marketing.	
	Sa	NAM neutral mill angle from the character their muchants	
	_	enam portal will enable farmers to snowcase their products	
		anywhere to quote price	
	_	e-NAM provides single window services for all info: commodity	
		arrivals quality & prices buy & sell offers & e-payment	
		settlement directly into farmers account, among other services.	
	_	License for the trader, buyers and commission agents can be	
		obtained	
	_	Harmonisation of quality standards of agricultural products and	
		infrastructure for quality testing	
	_	Additional features include (i) Warehouse based trading facilitate	
		trade based on e-NWR (ii) FPOs can trade their produce from	
	_	their collection centre	
	Be	enefits	
	_	Transparent Online Trading	
	_	Real-Time Price Discovery	
	—	Better Price Realization for Producers	
	_	Reduced Iransaction Cost for Buyers	
	_	Stable Price and Availability to Consumers	
	_	Quanty Certification, warehousing, and Logistics	
	_	More Enicient Supply Chain	
	_	Fragment and Delivery Guarantee	
	_	Entor Free Reporting of Transactions	
	—	Enhanced Accessionity to the Market	

-		
	Way Forward	
	mechanism and do away with their traditional interactions with	
	The e-NAM mechanism should include state-of-the-art technologies	
	to enable quick and accurate associate of the reasonable cost	
	Assaying should be made mandatory for transactions under e-NAM	
	It is necessary to ensure that $e_NAM/APMC$ markets have	
	appropriate storage facilities to provide cost-effective warehousing	
	facilities to farmers to avert distress sale	
21.	Farmer Producer Organization	
	Intro	
	- FPO is a group of farmers that come together to achieve synergy	
	in their activities for reducing cost and increasing income.	
	– Small Farmers' Agribusiness Consortium (SFAC) is providing	
	support for the promotion of FPOs.	
	- It is a registered entity where farmers are shareholders.	
	- One or more institutions and/or individuals may promote the	
	FPO by way of assisting in mobilization, registration, business	
	planning and operations.	
	- However, ownership control is always with members and	
	management is through the representatives of the members.	
	Government initiatives to promote FPOs	
	- Equity Grant Scheme - operated by the Small Farmers Agn- Business Consortium (SEAC) to extend support to the equity	
	hase of Farmer Producer Companies (FPCs) by providing	
	matching equity grants up to a maximum of Rs 15 lakh in two	
	tranches.	
	- Credit Guarantee Scheme - risk cover to banks that advance	
	collateral-free loans to FPCs up to Rs 1 crore. Only about 1% of	
	registered producer companies have been able to avail the	
	benefits.	
	- Central Sector Scheme of Formation and Promotion of	
	10,000 FPOs - launched by the Ministry of Agriculture &	
	Farmers Welfare to form - implemented by the SFAC, National	
	NAFED among others	
	- While adopting a cluster-based approach the formation of FPOs	
	will be focussed on "One District One Product" for the	
	development of product specialization.	
	Challenges	
	- Structural issues - inadequate professional management, lack of	
	technical skills, weak financial status, lack of risk mitigation	
	mechanism, and inadequate access to market and infrastructure	
	– Getting institutional credit is another big problem for FPOs	
	 Fragmented land holding in India 	
	- Poor women participation	
	 Isolation of FPOs with various service providers, etc. 	
	way Forward	
	Report 2021.	
	- Make it easier for FPOs to avail government programs and	
	schemes for providing equity grants and loans	
L		

	- Enhance Capacity building of FPO members to establish	
	relations with customers, establish internal governance	
	processes among other things.	
	– Land consolidation of FPO members can overcome the	
	constraint of small farm size	
	 Encourage Women farmers to group cultivate for getting better 	
	returns.	
	 Banks must frame structured products for lending to FPOs 	
	 Link FPOs with various essential service providers like technical 	
	service providers, input companies, marketing companies,	
00	retailers, etc.	
22.	Small Farmers' Agribusiness Consortium	
	society under Department of Agriculture Cooperation & Farmers'	
	Welfare	
	Main functions of SFAC	
	- Promotion of development of small agribusiness through VCA	
	scheme.	
	- Helping formation and growth of Farmer Producer Organizations	
	(FPOs) / Farmer Producer Companies (FPCs).	
	- Improving availability of working capital and development of	
	business activities of FPOs/FPCs through Equity Grant and	
	Credit Guarantee Fund Scheme.	
	- Implementation of National Agriculture Market (e-NAM)	
	Electronic Trading platform.	
	Various FPO promotion programmes undertaken by SFAC	
	- Mission Organic Value Chain Development (MOVCD) National	
	Food for Security Mission (NFSM)	
	- Mission for Integrated Development of Horticulture (MIDH) etc.	
	- SFAC has promoted 910 FPOs in the country out of which 58	
	FPOs are from Uttar Pradesh.	
23.	Contract farming – Benefits & Challenges	
	- Agricultural production (including livestock and poultry) - carried	
	out based on a pre-harvest agreement between buyers (such as	
	food processing units and exporters), and producers (farmers or	
	farmer organisations).	
	- Producer can sell the agricultural produce at a specific price in the	
	future to the buyer as per the agreement.	
	- Regulated under the Indian Contract Act, 1872.	
	- The model APMC (Agricultural Produce Market Committee) Act,	
	compulsory registration of contract farming sponsors and dispute	
	settlement	
	Benefits	
	- Enhances market linkages and reduces dependence on	
	middlemen.	
	- Integrate farmers with bulk purchasers including exporters, agro-	
	industries etc. Since the factories will be next to clusters of farms,	
	wastages will be very largely eliminated.	
	- Better price realization through mitigation of market and price	
	risks to the farmers. It facilitates better access to technology, crop	
	diversification, extension services, financing and crop insurance.	

-	Farmers no need to transport their produce to the mandis, as	
	sponsors usually collect the produce from the farm gate.	
-	Food-processing will get a boost as an employment generator.	
-	Encourage the new generation to take up farming instead of	
	migrating to cities.	
-	Rural women, instead of being employed as farm labourers will work	
	in sorting and grading of fruits and vegetables.	
-	It also gives farmers an alternative in cases where the procurement	
	mechanism is ineffective.	
Ch	nallenges	
-	It can be detrimental by encouraging large monoculture farming .	
-	Dependency of farmers on companies for seeds and equipment	
	also needs to be looked at.	
-	Contracting firms can exploit the monopsony situation to their	
	advantage by othering lower prices to farmers.	
-	State cooperation Most often these reforms fall victim to Centre	
	States political differences	
_	Problems faced by growers like undue quality cut on produce by	
	firms delayed deliveries at the factory delayed payments low price	
	and pest attack on the contract crop which raised the cost of	
	production.	
_	Lack of enforceability of contractual provisions can result in breach	
	of contracts by either party.	
Pre	ovisions of Model Contract Farming Act, 2018	
-	Protecting the interests of the farmers, considering them as weaker	
	of the two parties entering into a contract.	
-	In addition to contract farming, services contracts all along the	
	value chain including pre-production, production and post-	
	production have been included.	
-	"Registering and Agreement Recording Committee" or an	
	"Officer" for the purpose at district/block/ taluka level for online	
	registration of sponsor and recording of agreement provided.	
-	insurance in operation	
_	Previously market fees and other levies are paid to the APMC for	
	contract farming when no services such as market facilities and	
	infrastructure are rendered by them.	
-	Now Contract framing to be outside the ambit of APMC Act as per	
	the recommendation of Committee of State Ministers on	
	Agricultural Reforms	
-	No permanent structure can be developed on farmers'	
	land/premises	
-	No right, title of interest of the land shall vest in the sponsor.	
-	No rights, title ownership or possession to be transferred or	
	alienated or vested in the contract farming sponsor etc.	
-	contract farming and services at village / nanchavat level provided	
_	Accessible and simple dispute settlement mechanism at the lowest	
-	level possible provided for quick disposal of disputes	
	reserve provided for quien disposal of disputes.	

24.	Crop Insurance in India	
	Need:	
	- Erratic Monsoon, High Indebtedness, Loss of Crops, Market	
	Failures and Storage inadequacies are impacting Small and	
	Marginal Farmers (85%)	
	Advantages of Crop Insurance	
	1. Income stability - assists farmers in managing yield and	
	price risks.	
	2. Minimum debts- Even during crop failure, farmers will	
	condition to repay their loans	
	3. Govt burden on Loan Waivers/NPA	
	4. Technological advancement - Insurance companies can	
	also provide information on how to reduce losses	
	5. New agricultural practices - adopt new agricultural	
	practices try new measures to protect their crops.	
	Insurance Schemes:	
	- Pradian Manuf Fasal Bina Yojana (PMFBY)	
	- weather-based Crop Insurance Scheme (WBCIS)	
	- Pliot Unlined Package insurance scheme (UPIS)	
	- Coconut Palm insurance scheme (CPIS)	
	The cropped area under insurance was 26 per cent/ 50% target	
	Deleved componention	
	- Delayed compensation	
	- Deciming demand for crop insurance among farmers	
	high costs of reingurance due to errotic weather	
	- Ingli costs of refinsurance due to enfance weather	
	- spike in claims	
	- Chanenges and delays with crop loss estimation.	
	- Gove has capped its share at 30%.	
	- State govt share of Preinfulli not prohipity paid	
	Attitudes and percentions of various stalksholders on the	
	- Autous and perceptions of various stakenoluers on the	
	- Standing Committee on Agriculture recommended a revenued	
	PMFRV from 2022	
	Conclusion:	
	Making crop insurance work well is one of the key ways to insulate	
	farmers from volatility in farm incomes and make farming sustainable	
	especially as India moves ahead with reforming the agriculture sector	
25	Agriculture subsidies	
43 .	ngiloulture substates	
	 Farm subsidies form about two percent of India's GDP 	
	 Policy instruments to support farmers in India include 	
	\circ subsidised fertiliser, power, agri-credit and crop	
	insurance on the input side	
	\circ loan waivers and MSP for major crops on the output front.	
	Types	
	- Price subsidies (MSP, fertilizer, Electricity) - help to fight	
	inflation and price volatility	
	– DBJ	
	– Income Support – PM KISAN, Telangana's Rythu Bandhu &	
	Odisha's KALIA	

Rationale	
– Farm subsidies \rightarrow Access to quality inputs such as seeds,	
fertilizers \rightarrow Increase in productivity \rightarrow Better income to farmers	
$\mathbf{matiwate formers to continue forming } = ensures food security$	
- indivate faitures to continue faituring \Box ensures food security	
IAM trinity increased effectiveness of subsidies, removes horas	
accounts	
 Agricultural input subsidies and the Green Revolution prevented famine 	
 equity between rich and poor farmers- makes inputs affordable, enables usage of modern technology- income increases Ex: Infrastructural subsidies. 	
- Helps to change the cropping pattern, promote sustainable	
- make former equipped with knowledge	
- Help to contain the migration from the agriculture sector to	
other sectors	
Problems of Subsidies	
- Issues in Identification of Beneficiaries lack of digital	
financial literacy in rural areas	
– Marginal returns on subsidies are way below those from	
investments; Agri subsidies > Agri investment by govt	
- rich household benefits more than poor households, not	
transformed lives of poor	
 Price subsidies distort markets -hurts the poor- regressive 	
- Non-MSP crops under cultivated - supply demand mismatch -	
lack of diversity in food crops – promotes mono cropping	
 Leakage, diversion and wastage of govt resources 	
- Input subsidy, Overutilization of inputs, soil degradation, soil	
nutrient imbalance, environmental harm, and groundwater	
depletion	
 misused to gain political mileage during elections 	
Conclusion	
- Rationalizing subsidies, Kelkar committee recommended	
the phased elimination of subsidies and convert them to capital	
investments, need for long term policies on export trade,	
Minimum Support Price (MSD)	
Minimum Support Frice (MSF)	
MSP is a form of market intervention by the Government	
- to insure agricultural producers against any sharp fall in farm	
prices during bumper production years.	
 to support the farmers from distress sales 	
 to procure food grains for public distribution. 	
Benefits	
- Incentivise production of a specific food crop which is in short	
supply.	
- Protects farmers from any sharp fall in the market price of a	
- i fotocis farmers nom any sharp fan in the market pilce of a	
commonity, unwarranted nuctuation in prices	

	_	Ensures that the country's agricultural output responds to the	
		changing needs of its consumers.	
		• Ex: The government hiked the MSP of pulses to expand	
		sowing of pulses.	
	—	Higher farm profits will encourage farmers to spend more on	
		inputs, technology etc.,	
	_	beneficial in transferring incomes to rural areas and to counter	
		farm level inflation.	
	_	countered the agricultural distress brought on by natural	
		hazards in the country.	
	—	Lack of sufficient penetration of agricultural insurance schemes	
		for farming has made farming a risky profession exposed to	
		weather and price fluctuations.	
	_	guaranteeing a minimum floor price, Acts as a benchmark for	
		private buyers	
	—	Helps informed decision making	
	Chall	enges	
	_	Sharp and frequent increases in MSP can feed inflation too.	
	_	MSP is benefiting the large traders rather than farmers. Small	
		farmers do not have enough marketable surpluses.	
	_	Their crop is usually sold to traders at low post-harvest prices in	
		the village itself or the nearest mandi.	
		• According to recent research, farmers may typically get as	
		little as 25% of the price that consumers finally pay.	
	_	The input costs have been rising faster than sale prices	
		decreased farmers income	
	_	Economically Unsustainable : The economic cost of procured	
		rice and wheat >> market price of the same.	
	_	Limited Awareness among farmers	
	_	Surplus grains produced can't be exported due to WTO norms	
27.	WTO	and subsidies	
	WTO'	s agreement on agriculture was concluded in 1994, and was	
	annet	s and integration of global markets	
	ucces	t and metgration of global marketo.	
	Agree	ement on agriculture stands on three pillars:	
	1. Do	mestic Support : It calls for reduction in domestic subsidies that	
	distor	ts free trade and fair price.	
	_	Aggregate Measurement of Support (AMS) is to be reduced by	
		20% over a period of 6 years by developed countries and 13%	
		over a period of 10 years by developing countries.	
		Subsidies are categorized into:	
		• Green Box : subsidies that do not distort trade, or at most	
		cause minimal distortion.	
		• Amber Box : All domestic support measures considered to	
		distort production and trade (with some exceptions)	

	• Blue Box : This is the "amber box with conditions". Such	
	conditions are designed to reduce distortion	
	2 Market Access	
	And the Access requires that tariffs fixed (like custom duties) by	
	- Market access requires that tarms fixed (like custom duries) by	
	individual countries be cut progressively to allow free trade.	
	- It also required countries to remove non-tariff barriers and	
	convert them to Tariff duties.	
	3. Export Subsidy	
	- Subsidy on inputs of agriculture, making export cheaper or	
	other incentives for exports such as import duty remission etc	
	are included under export subsidies.	
	– These can result in dumping of highly subsidized (and cheap)	
	products in other country and damage domestic agriculture	
	sector of other country.	
	India's Position	
	- Many countries have filed complaints in WTO against various	
	welfare and subsidy programs run by government of India	
	especially MSP and sugar subsidy. E.g., India vs USA case	
	 India has always pointed out the imbalances in the Agreement 	
	on Agriculture at the WTO i e in favour of developed countries	
	historical asymmetries and imbalances must be corrected to	
	- instolical asymmetries and imbalances must be corrected to	
	ensure à ruie-based, fair and equitable order.	
20		
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	 To increase the production of edible oil to achieve self-reliance- hybrid seeds, increase in area 	
	 Targets nine oilseeds - groundnut, mustard, soybean, safflower, 	
	 sesame, sunflower, etc. Incentives to farmers who were also provided processing facilities → irrigation, fertilizers, pesticides, etc. transportation, MSP, warehousing. Launched Oil Technological Mission in 1986. Blue Revolution: To develop, promote fisheries to double the farmers' income. keeping in view the sustainability, bio-security. Tapping total fish potential of India on both islands & marine sector & to triple production by 2020 Other Revolution: Black Revolution: To increase petroleum production, accelerate the production of ethanol and to mix it with petrol →biodiesel. Returns to farmers, supplement scare resources of hydrocarbons, reducing pollutants 	
	Pink Revolution: Export and production of meat in India. \rightarrow technological revolution in the poultry and meat processing sector.	
	Grey Revolution: Increased fertilizer production \rightarrow associated with the mal effects of the green revolution of India focusing on what can happen if the new agricultural equipment turns things wrong.	
	Silver Revolution: production of eggs was increased during the Silver Revolution phase. made possible due to medical science and more protein-rich food for the hens.	
	Golden Revolution: This made India world leader in production of bananas , mangoes , etc. and provided sustainable livelihood and nutrition options.	
	Brown Revolution: demand for coffee by growing socially responsible and environment-friendly coffee. Related to Visakhapatnam's tribal areas.	
20	Public Distribution System	
<u>.</u>	PDS-Food security system to distribute food & other items to India's poor at subsidized rates. Commodities distributed → wheat, rice, sugar & fuels like kerosene, through network of fair price shops . FCI, a govt-owned corporation, procures and maintains the PDS. State Govt → Distribution. Central govt → procurement, storage, transportation, and bulk allocation of food grains	
	 Significance: Ensuring Food and Nutritional Security Helps in stabilizing food prices and making food available to the poor at affordable prices. Maintaining the buffer stock of food grains in the warehouse→flow of food remains active 	
	 Helps in redistribution of grains by supplying food from surplus regions to deficient regions. 	

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	 The system of MSP and procurement has led to the increase in food grain production. 	
	Shortcomings:	
	 Rogue dealers swap good supplies received from the FCI with inferior stock and sell privately. Also malpractice, illegal diversions, black marketing 	
	 Identification of households & distribution of granted PDS services highly irregular in states 	
	 Poor supervision of FPS & lack of accountability 	
	 No clarity on which families be included/excluded in BPL list- genuinely poor being excluded 	
	 Seasonal migrant workers or those who live in unauthorized colonies suffer. 	
	 Many families mortgage ration cards for money. 	
	 Performance audit by CAG revealed serious shortfall in Govt Storage capacity. 	
	Way forward:	
	 Aadhar - solving the problem of identification and distribution of PDS services 	
	 Alternatives like Cash transfers, Food coupons 	
	 Swift implementing of ONOR card scheme 	
	 Frequent checks and raids-eliminate bogus cards. 	
	 Computerization of the entire process 	
	 Use of GPS tech-tracking trucks with PDS goods. 	
	 Efficient Grievance redressal mechanism. 	
	 Public participation through social audits and SHGs, Cooperatives and NGOs-Transparency 	
	 Diversifying the food basket according to the local needs, including biofortified food etc. 	
30.	Modernization of PDS	
	The Public Distribution System (PDS) manage the scarcity of foodgrain, ensure stability in the prices, rationing of foodgrains in case of deficit in supplies	
	Public distribution system \rightarrow "welfare-based" to the presently " rights -	
	based" food-security platform governed under the National Food	
	Security Act (NFSA)	
	GAPS IN THE EARLIER SYSTEM:	
	 Leakages, pilferages and diversions of food grains at almost every point of the Supply Chain 	
	- inclusion & exclusion Errors, exploitation of manual records to	
	gain→duplicate/ fake ration cards. – The manual record keeping →Dealers indulge in malpractices.	
	BIOMETRIC/ AADHAAR AUTHENTICATION OF BENEFICIARIES AT	
	Fair Price Shops:	
	distributed to beneficiaries through biometrically/ Aadhaar authenticated ePoS transactions	

	Utility: systematically reduce the ghost lifting of highly subsidized	
	foodgrains + increasing the rightful targeting of genuine	
	beneficiaries of the Food Subsidy.	
	SMS ALERTS TO BENEFICIARIES:	
	SMSs are also being delivered to beneficiaries in some States/UTs	
	informing about quantity and expected time of arrival of foodgrains	
	at their EDSs to plan their visit	
	PORTABILITY OF BENEFICIARIES WITHIN STATE:	
	ePoS installation at FPSs and Aadhaar seeding of beneficiaries with	
	their ration cards, the States/UT	
	Utility: implementation of the intra-State portability of ration cards	
	SPECIAL DISPENSATION OF FOODGRAINS:	
	Some states/UTs have adopted "Special Dispensation of	
	Foodgrains" to old-age and differently-abled beneficiaries with no	
	other adult member in the household and are not in position to visit	
	the FPSs	
31.	National Food Security Act (NFSA), 2013:	
•1.	$-$ provide for food and nutritional security \rightarrow human life cycle	
	approach	
	Key leatures:	
	- Coverage and entitlement under Targeted Public	
	Distribution System (TPDS): 50% urban / 75% of the rural	
	population \rightarrow 5 kg per person per month \rightarrow 35 kg of food grains	
	per household per month under Antyodaya Anna Yojana	
	(AAY).	
	– Subsidised prices under TPDS and their revision:	
	- For a period of $3/2/1$ per kg for rice, wheat and coarse grains	
	Identification of Householder determined for each State	
	- Identification of Households, determined for each state.	
	- Nutritional Support to women and children: Integrated Child	
	Development Services (ICDS) and Mid-Day Meal (MDM)	
	schemes.	
	- Maternity Benefit: Pregnant women and lactating mothers will	
	also be receiving maternity benefit of Rs. 6,000.	
	- Women Empowerment: eldest woman of the household of age	
	18 years or above is to be the head of the household	
	Grievance Redressal Mechanism: Grievance redressal	
	- Gilevalice Reulessal mechanismi, Gilevalice Iculessal	
	mechanism available at the District and State levels.	
	 Transparency and Accountability 	
	 social audits and setting up of Vigilance Committees. 	
	- Food Security Allowance: In case of non-supply of entitled food	
	grains or meals, there is a provision for food security allowance	
	to entitled beneficiaries.	
	Challenges in the Implementation of NFSA	
	- Effect of population increase and availability of foodgrains	
	- Identifying the heneficiaries:	
	apositio muidolines for identifying Dural (urban honoficiaries	
	- specific guidelines for identifying Kural/urban beneficiaries	
	 Operational inefficiencies in PDS: 	
	– The supply chain of foodgrains distribution are procurement,	
	storage, transportation and distribution –operational	
	inefficiencies occur.	

 Intro: Animal rearing is considered an integral part of agricultural activities in rural India → provides non-farm employment and income in rural areas. Significance of animal rearing in India animal matring 40% of the rural CDD ecrose in dia 	
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animal maning 100/ of the mund ODD senses In the	
- ammai rearing, 40% of the rural GDP across India.	
- arid and semi-arid regions of India, agriculture is possible only	
for three to six months	
- high-cost irrigation investments are beyond the reach of most	
the farmers.	
Livestock census:	
- India – world's highest livestock 1st in bullato population – 2 nd	
Goals, Fouldy, Fishing, S ^{ra} in Sheep	
importance of animal feating in farmers economy	
– Food Security	
The livestock provides food items such as Milk, Meat, and Eggs	
for human consumption	
- Fibre and skins:	
Leather is the most important product which has very high	
Animala for agricultural energians and transport The	
- Animals for agricultural operations and transport \rightarrow fill bullocks are saying a lot on fuel \rightarrow billy terrains \rightarrow mules and	
ponies	
– Animal waste: Dung and other animal wastes serve as very good	
farm vard	
- Livestock as asset : Livestock is considered as 'moving banks'	
Capital of landless agricultural laborers	
- Weed control: cattle graze off the weeds.	
Socio-cultural importance	
- They have been responsible for developing and conserving	
domestic animal diversity with important genetic traits	
 Milk marketing network 	
- The sale of milk does help family farms to get regular income,	
though not high profits	
Important Initiatives by the Government	
- Rashtriya Gokul Mission: develop and conserve indigenous	
breeds of the bovine population and enhance milk production	
- National Livestock Mission capacity building of all	
stakenoiders.	
- National Artificial Insemination Programme	
- National Cattle and Builaio Breeding Project: upgrade	
Animal Husbandry Startun Grand Challenge: innovations	
coming from the villages to expand the dairy sector in India	
Way forward	
- incorporating seeds that vield good edible biomass in our	
agricultural practices;	
- Right cattle/ buffalo breeds in different agro-climatic regions;	
Eg: In western India, high-yielding milk breeds can be used in pure	
form	
 promoting milk recording at farmers' gate; 	

	 promoting milk yield competitions in different regions for identifying good milk-yielding cows 	
33.	INTEGRATED FARMING SYSTEM	
	The Integrated Farming System (IFS) is a combined approach or sustainability, food security, farmer's security and poverty reduction by involving livestock, vermicomposting, organic farming etc.	
	Integrated Farming System ensures sustainable agricultural production through:	
	 Economic activity: IFS provides an opportunity to increase economic yieldintensification of crop and allied enterprises FOR Small and Marginal→ Employment and Labour Reduced use of fertilisers: fertilisers and recycling nutrients. Environmentally sustainable: Eg: integrated pest management and Recycling: by-products and waste material Resource management: rejuvenation of systems productivity and to achieve agroecological equilibrium. 	
	Challenges:	
	 Affordability: small and marginal farmers cannot afford large cattle Acceptance: hesitation among the farmers especially fisheries, poultry, duck rearing because of lack of role models and religious perceptions. Not under MSP: Mushroom farming and beekeeping are not covered under the Minimum Support Price (MSP) system. 	
	Way forward:	
	 Better integration with the food processing industries 	
	 Integrating subsistence agriculture: Eg in NER→Encouraging livestock enterprises Building farmer capacities: eco-friendly and self-sustaining integrated farming systems. 	
	Conclusion:	
	 IFS provides multiple benefits that are sustainable and can pave the way for climate-smart agriculture. India needs to adopt a "well designed" Integrated Farming System (IFS) to realise the vision of doubling farmers' income by 2022 and having sustainable agricultural practices. 	
34.	Food Processing	
	 Scope: Huge domestic market Abundant raw material. Changed consumption pattern. Penetration of food retailers. Export opportunities. Proactive government policy. 	

2022- MAINS STUDY MODULE

Significance of food processing:

Economic significance:

- Employment generation.
- Farmers income.
- Increase in exports.
- Curbing food inflation.
- Crop diversification.

Social significance:

- Reduce malnutrition. -
- Reduce food wastage.
- Curbing migration.
- Preserve nutritive quality.
- Consumer choices.
- Gender empowerment.

Supply chain management:

A supply chain is an entire system of producing and delivering a product from sourcing a raw material to the final delivery of the product. ARAJAURILIAS ACADRI

Upstream requirement:

- Accessibility to raw materials.
- Modern extraction technique.
- Good linkage with farmers.
- Storage facility.
- Transport facility.

Downstream requirement:

- Processing techniques.
- Quality testing
- Retail source.

Challenges: Supply side issues

- Quality of food.
- Low value addition.
- Availability of raw materials.
- Poor marketing.

Infrastructure related issues.

- Lack of supply chain infra.
- Cold chain capacity low.

Demand side issues.

- Low consumer awareness
- Social perception.

Government schemes and measures:

- National mission on food processing.
- 100 FDI in marketing of food products
- Dairy processing industry fund.
- Agri export zones.
- PM kisan SAMPADA yojana.
- Mega food parks scheme.
- Operation greens.