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ADVANCED INTEGRATED MENTORSHIP

AGRICULTURE-ASSESSMENT TEST-16

(To be filled by candidate)

Test Code : TC317

Name of Candidate : Abhishek Singh

NEXT IAS Roll No. : AIMGCL1035 **Date of Examination :** 15th Oct-2023

Exam Centre : Old Rajinder Nagar ☐ Bhopal ☐ Online ☑

GENERAL INSTRUCTIONS

This Question-cum Answer (QCA) Booklet contains 32 pages. Immediately on receipt of the booklet, please check that this QCA booklet does not have any misprint or torn or missing pages or items, etc. If so, get it replaced by a fresh QCA booklet.

Candidates must read the instructions on this page and the following pages carefully before attempting the paper.

Candidates should attempt the questions strictly in accordance with the instructions specified in the question paper and in the space prescribed under each question in the booklet. Any answer written outside the space allotted may not be given credit.

Question paper will be provided separately and can be taken by the candidates after conclusion of the exam.

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SUBJECT/PAPER
GENERAL STUDIES (3)

Invigilator's Sign. : .....

(For filling by Examiners only)

Evaluator Code :

Q.No	Pg No.	Maximum Marks	Marks	Total
1	1			
2	3			
3	5			
4	7			
5	9			
6	11			
7	14			
8	17			
9	20			
10	23			
Grand Total				

Signature

MACRO COMMENTS

1. Constraints in the Agriculture sector in India have been a major hurdle in achieving sustained growth and development. Discuss the various challenges faced by the agriculture sector in India and suggest policy measures to address these challenges.

(Answer in 150 words) 10 marks

India is agriculture based economy with more than 60% workforce in it & its contribution to GDP being 16-17 %. (ICAR)

Challenges faced by Agriculture

(1) fragmented land holding
- As per Economic Survey more than 72% farmers have less than 2 hectares of land

(2) Low yield : Compared to china India has lesser productivity

(3) Excessive irrigation : due to green revolution → Salinization of land.

(4) feminization of Agri : more than 70% women workers but

hold less than 12 % land (ICAR)

(5) Poor technology adoption: as it is costly & low awareness among small farmers.

Policy measures to address challenges

(1) Promoting manufacturing sector: to shift workers from Agri → Industry

(2) Contract farming: to eliminate middlemen ⇒ profitable agri

(3) Cooperative farming: to solve issue of land fragmentation

(4) Technology services in vernacular language.

(5) Drip & Sprinkler irrigation / precision farming

(6) Promoting self help groups & providing women alternative employment.

SDG goal 1 (end poverty) & SDG goal 2 (Hunger ending) can be achieved by solving above problems.

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2. Evaluate the impact of irrigation on the environment and natural resources, and suggest measures to ensure the sustainability and equity of irrigation practices in agriculture.
(Answer in 150 words) 10 marks

In India for 43% Net shown area 49% is irrigated & 51% is rainfed. out of irrigated 40% is by Canal irrigation & 60% is by Ground water irrigation.

Impact of Irrigation :

① Environment :

↳ huge water in Rice ⇒ Rice Plants release Green house gases ⇒ global warming.

↳ Destruction of water bodies as lakes disappearing.

↳ Irrigation can help in afforestation ⇒ helps fight climate change

② Natural resources

↳ Creating Dams (multipurpose projects)

: Diverts water ⇒ may affect ecology.

↳ Excessive groundwater extraction = Causes water stress (India 25% GW extracted of world ~23% Critical zone (CGWB)

Measures to ensure Sustainability & equity :

① using Micro irrigation → Drip, Sprinkler

② water harvesting & traditional structures e.g. Johad (Rajasthan)

③ using technology (GPS, GIS) to determine timing & quantity of irrigation.

④ Reducing subsidy on free electricity & water especially for rich farmers

⑤ Interlinking of river ⇒ equity.

Due to climate change, being monsoon dependent is dangerous. we must rationalize our irrigation system with above steps to make it 'future ready'

3. What is the Silvopasture Agroforestry System? How can it be effectively utilized to improve local climate resilience in India? (Answer in 150 words) 10 marks

Agroforestry is a modern method of Agriculture when both trees & crops are grown together.

Silvopasture Agroforestry

↳ In this Agroforestry + Livestock are included.

↳ Here Trees + beneficial crops + Livestocks are Co-dependent & Supplement each other.

↳ Cow dung → used as manure in the field.

↳ trees help prevent soil erosion

↳ Also generates extra ~~incl~~ income for farmers & saves cost.

Silvopasture Agroforestry & its use in improving climate resilience →

(1) Less use of fertilizers → less Green house gas emission

(2) Insurance during crop failure due to climate change eg: drought

(3) less water usage → Sustainable development, acquifer recharge & watershed development

(4) fights pollution : As trees act as kidneys

(5) Soil erosion prevented.

However, challenges → low yield of crops
↳ lack of modern equipments
↳ Animal diseases eg: Foot & mouth disease
↳ trees Consume lot of water of crops → low Productivity.

Despite above challenges ~~this~~ Silvopasture Agriculture is very beneficial for climate resilience & should be promoted.

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4. In the light of recent Government push for GM crops like DMH-11, critically analyze the advantages and concerns related to GM crops in India in ensuring food and nutritional security in India. (Answer in 150 words) 10 marks

GM crops are those in whose some genetic material has been altered to produce desired effects: eg: Bt-Cotton.

Advantages of GM crops:

- High yield → food security, Nutritional Security.
- Doubling farmers income
- Fighting climate change eg: Drought resistant varieties
- Export potential increases
- More employment generation
- Helps food processing Industries by giving quality products/raw materials
- Helps Comply with Sanitary & phytosanitary measures in EU/USA markets

Concerns of GM crops

1. Safety: to Human health as Consequences are unknown
2. Monopoly of few Companies on GM seeds
   Eg: Terminator seeds of Monsanto
3. High input cost to farmers
4. may wipe out local biodiversity
5. Protests by activists group hinder development

Steps to solve issues

- GEAC should be given more powers
- IPR law reforms (Eg: Section 3d)
- Awareness among farmers of their rights (PPVFR act 2003)
- Strict Scrutiny.

GM crops are inevitably for future food security hence it must be introduced with Strict Scrutiny.

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5. What do you mean by Minimum Support Price (MSP)? How will MSP rescue the farmers from the low-income trap? (Answer in 150 words) 10 marks

MSP is the price guaranteed by Government to farmers for their Crops.

- MSP → Price recommended by CACP & approved by Cabinet
  - Minimum price (can't go below this)
  - 23 Crops presently declared
  - declared before cropping season.
  - Swaminathan Committee: it is atleast 50% greater than Cost of production.

MSP & rescuing farmers from low income trap:

(1) Income Security: as a fixed source.

(2) Pre planning : farmers can plan what crop to grow based on MSP announced by govt.

(3) Insurance against Middlemen

(4) Can put crops in warehouses → generate e-NWR (Reciepts) to get credit from banks.

(5) Crop diversification

Challenges → effectively only few crops are procured.

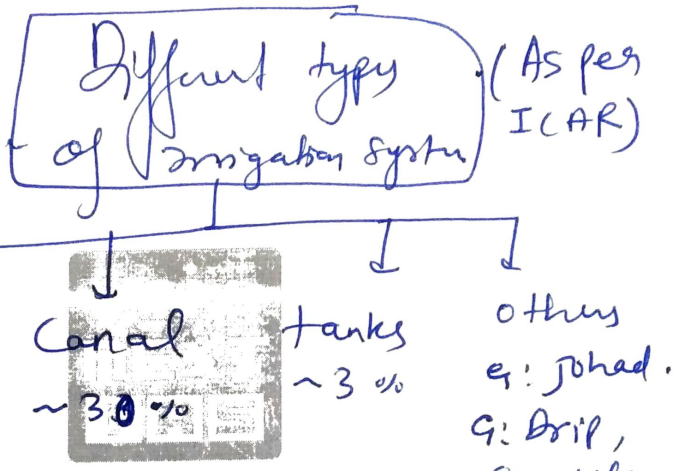
↳ Lack of cold storage → price discovery is poor due to distress sale.

↳ High transportation cost as centralized procurement happens.

As per Swaminathan Committee only 6 % of farmers (rich) benefitt from MSP. Above issues should be resolved to tovely. lift farmers from low income trap.

6. Discuss the different types of irrigation and irrigation systems used in agriculture, highlighting their advantages and disadvantages. (Answer in 250 words) 15 marks

In India 49% of Net Shown area is under Irrigation & 51% of area is rainfed (Economic Survey 2021)



① Tube wells

→ most widely popular -
→ Northern India Eg: Punjab

Advantages	Disadvantages
→ very quick	→ Costly
→ assured supply	→ over extraction Eg: 23% is over critical (CGWB)
→ fast rate	

→ High yield

→ technical errors
→ High repairing cost

(2) Canal

→ most popular in Rajasthan, Eastern UP etc

→

Adv.	Disadv.
→ 'Warabandhi' method ensures equitable distribution → Helps poor & marginal farmers	→ Seasonal supply → leakages. → damaged liners.

(3) Tanks

→ Southern India where ground is Hard rock.

Adv.	Disad.
→ Helps Small & marginal farmer	→ land Consumption
→ less Costly	→ leakages
→ rain also replenishes it	→ Eutrophication

④ Micro Irrigation

→ Includes Drip & Sprinkler

Advant:	Disad.
→ High efficiency (~90%)	→ Very costly
→ Precision farming	→ technical errors frequent
→ High yield	→ low awareness
→ fights climate change	

Irrigation is lifeline of agriculture

Among above micro irrigation is most efficient & should be promoted.

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7. AI and Machine learning have revolutionised a number of industries, how can these technologies be deployed to improve Agricultural production and Productivity?
(Answer in 250 words) 15 marks

E-technology, ICT can be used to increase agricultural productivity but it also faced many challenges.

AI & Machine learning
- Data Driven Systems
- Trained as per the requirements
- Autonomous
- feedback & Improvement in response.

AI, Machine learning & Agriculture: 6

① At input stage, AI & ML can be used in

(a) Seed → Developing High Yield varities.
↳ GM seeds

(b) fertilizers
↳ Developing efficient products
eg: Nano Urea
↳ Predicting requirement of quantities.

(c) water
↳ regulation of supply of water

(2) At farming stage
↳ Predicting the Moisture in soil.
↳ weather information.
↳ GIS/GPS ⇒ Scan diseases using AI data

(3) Post harvest stage
↳ Supply chain management (Storage, transport & marketing driven by data analytics, precise price discovery etc).

However challenges do exist

- Lack of awareness among farmers / Poor technology adoption
- High Cost & fragmented land size in India (80% Small & marginal farmers)
- Data Security
- Vernacular language Content not present

Steps to solve issues

- Information, education & Communication via Krishi Vigyan Kendra
- Custom hiring centres (farm mechanization)
- farmer producer organizations can afford AI & ML devices.
- Policy level changes.

AI & ML can be useful in changing Agricultural landscape amidst growing uncertainty of climate change.

8. Analyze the impact of liberalization and globalization on Indian agriculture and the challenges faced by farmers in the globalized economy. (Answer in 250 words) 15 marks

LPG reforms were taken in 1991 which primarily changed Indian economy of Agriculture oriented to Service oriented..

Impact of liberlization →

Positive

(1) More Competition in agri. production eg: Contract farming.
(2) Innovation & more Research
(3) Commercialization of crops
(4) capital investment increased

Challenges

(1) Decreased labour force in Agriculture as people shifted to Service & manufacturing Sectors

(2) Feminisation of Agriculture as males moved from rural to urban areas
→ 70% women labor holds less than 12% land (ICAR)

(3) Cooperative farming, SHGs disadvantaged viz. MNCs.
e.g.: Cottage industries suffered.

Impact of globalization ☹

Positive ☺

(1) Export of Agricultural products increased : India net exporter since 1991.

(2) More forex & income to farmers

(3) Global value chain Integration ⇒ better price

Challenges

1. Poor product quality ⇒ less demand in US/EU market (WTO's Sanitary & Phytosanitary measures)
2. Dumping of cheap products from china. e.g: Rice
3. GM crops introduced in India → Safety issues
   → IPR issues
   → illegal cultivation etc
4. WTO Amber box Subsidy limit of 10% often breached. ⇓ disputes
5. Fisheries Subsidy issue at WTO {rights of global South.}

So LPG reforms had both types of impact but gains were more than losses & reforms should be taken to tackle existing issues.

dates must not this margin

9. What are the major factors responsible for making the rice-wheat system a success? In spite of this success, how has this system become a bane in India?
(Answer in 250 words) 15 marks

Ans

Green revolution caused rice-wheat system to flourish since 1960s first in North West India then later to rest of India.

Factors responsible for its success

① High Yield varieties of seed
↳ for eg: dwarf wheat variety it increased productivity by many fold.

② Irrigation: Huge irrigation projects were finalized
→ canals
→ tubewells
→ tanks all over.

(3) Fertilizers Subsidy given to farmers. / Pesticides import.

(4) Electricity at cheap rates

(5) Political will: stronger as we had to depend on PL-480 Subsidy of USA.

(6) Community & Civil society participation

(6) Research & development

(7) Land reforms on large scale.

(8) MSP guarantee.

Challenges / Fault created by it →

(1) Environmental

↳ Excessive irrigation → ground water depleted, Salinization

↳ fertilizer use indiscriminate

↳ release of green house gases

↳ Pesticide use → farmers health affected

(2) Economic

↳ Widespread regional disparity
e.g. North states Vs. South states.

↳ Rich farmers benefitted more (Divide → Inequality)

(3) Social

↳ feminization of Agriculture

↳ Exploitation of migrant workers. ⇒ Wages less than minimum wages.

(4) Others

↳ Monoculture promoted (MSP)

↳ Decreasing area under millets

SO, though Green revolution made India self sufficient we need Green revolution 2.0 to make it sustainable (SDG goal 12 → Sustainable Consumption & production Pattern)

10. What are the reformative steps taken by the Government to make food grain distribution system more effective? (Answer in 250 words) 15 marks

India being a welfare state (Article 38) undertakes distribution of food grains but it is not devoid of challenges.

Food distribution system

[Farmers] ⇒ [Procured by FCI] ⇓

[Beneficiary] ⇐ [Ration shops] ⇐ [reallocated to states]

Challenges in food distribution:

1. Leakages of quality food product
2. diverted food to other purposes (Black economy)
3. Beneficiary identification
   - ↳ exclusion & Inclusion error

(4) Poor digital Connectivity at fair price shops

(5) Lack of Infrastructure ⇒ hinders efficient transportation.

(6) Debt burden on FCI (Entails Budgetary borrowings)

(7) FCI godowns insufficient
↳ Lack of cold storage ⇒ wastage of grains.

Reformative steps by govt.

(1) Aadhar-linked Ration Cards (Computerization)

(2) Geotagging of trucks to prevent diversion

(3) Online monitoring of Supply chain ⇒ stops leakages.

(4) One Nation One Ration Card.

(4) Developing better infrastructure
Eg: roads → Gati Shakti platform
→ Gram Sadak Yojana.
etc.

(5) Direct benefit transfers in case grain is not given.

(6) PM-AASHA
↳ Price deficiency mechanism (Better price discovery)
↳ Involving private sector.

What more can be done

↳ Shanta Kumar Committee
↳ Relieve FCI of its functions (1)
↳ State govt. should procure food grains. (Outsource to private players)

↳ Swaminathan Committee
↳ include Millets in distribution

PDS has proved effective in ending hunger (SDG-2) & poverty (SDG-1), but above reforms should be implemented effectively to make inclusive development.