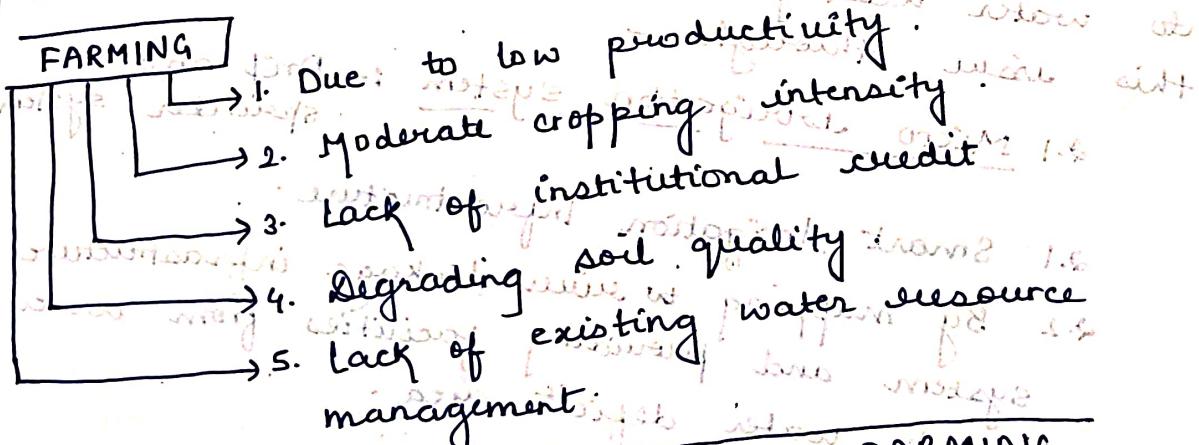


Q5. Artificial Intelligence (AI) and precision farming have been proposed as solutions to improve agricultural productivity in India. Critically analyze their feasibility and challenges in the Indian agricultural landscape. [38 marks]

Ans. NITI Ayog report says 85% farmers of India are from small and marginal farmers whose land holding capacity is less than 2 hectares and India's agricultural productivity is 30% less from global level and to address this we India needs AI and precision farming.

NEED OF ARTIFICIAL INTELLIGENCE AND PRECISION



FEASIBILITY OF AI AND PRECISION FARMING

PROS —

- in barrels from 5000 ft. deep, probably 1A 12

MONITORING SOIL HEALTH

MONITORING SOIL HEALTH soil health is divided into
Degrading soil health reduces the productivity, AI and precision farming will help to -
monitor and analyse

- Soil Survey

 - 1.1 Soil mapping and analysis
 - 1.2 Helps in soil classification, identifying
varieties of soil types
 - 1.3 Crop selection according to soil health, climate and weather conditions to recommend optimal crop choices based on soil condition to help farmers.
 - 1.4 Some based pesticides applications to control pests and diseases.

9. OPTIMISED IRRIGATION

OPTIMISED IRRIGATION

NABARD report says that in India more than 60% irrigated land is dependent on traditional flood irrigation which leads to water wastage and to this issue through Drip and spray system.

- 2.1 Micro irrigation - sprinkler irrigation
area distribution
 - 2.1 Smart Irrigation Infrastructure
 - 2.2 By mapping to river linkage infrastructure
system and providing facilities from water
surplus area to water deficit area.

3: MINIMIZING POST HARVEST LOSS

3. MINIMIZING POST HARVEST LOSSES

 - 3.1 AI enabled cold storage infrastructure
 - 3.2 By analysing specific crop demand in

specific area and integrating demand and supply zones.

3.3 Integrating agricultural infrastructure marketing

4. DIGITAL CREDIT INFRASTRUCTURE

Introducing digital banking to reduce banking operational time.

Digital KCC loan

Providing easy credit will increase

the productivity level.

5. PERCOLATION IN AGRI-ALLIED SECTOR

Strengthening forward -backward linkages.

5.1 Strengthening forward -backward linkages.

5.2 Increasing demand from food processing will increase farmer's income and productivity.

FEASIBILITY OF PRECISION FARMING

1. Optimise planting :- GPS mapping will identify low and high productivity area.

2. Incorporation of precision farming technology will increase productivity through

precision seeding, smart devices to monitor weather and climate change.

3. Using remote sensing satellite to estimate crop yield etc.

CONS 1. ECONOMIC CONCERN

1.1 High infrastructural cost in setting up AI and precision farming.

1.2 High cost will reduce profitability.



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की
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दीजिए

Candidate
must not
write on
margin

2. SOCIAL CONCERN

- 2.1 Job displacement like drone dispensing fertilizer and pesticides
- 2.2 Privacy issue :- AI enabled data monitoring can pose threat by using sensitive information.

3. TECHNOLOGICAL ADOPTION CONCERN

- 3.1 Existing digital divide pose difficulty to adopt AI technology by small marginal farmers.
- 3.2 Lack of technological skills will not lead to optimal utilisation to optimal

4. ENVIRONMENTAL CONCERN

- 4.1 Increasing green house gases
- 4.2 High energy consumption can lead to intensive farming practices
- 4.3 Soil erosion and degradation.

CHALLENGES

1. INFRASTRUCTURE AND CONNECTIVITY

- 1.1 Digital infra challenge :- Insufficient drones, sensors etc.
- 1.2 Limited internet connectivity :- Hinder in implementing AI application

2. SOCIAL FACTOR

- 2.1 Fragmented land holding
- 2.2 Low digital literacy



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3. ECONOMIC FACTOR: loss of employment will hinder inclusive development due to high infrastructural and operational cost.

4. REGULATORY CHALLENGES

4. REGULATION

 - 4.1 Red tapism and regulatory challenges
 - 4.2 Transparency and accountability issue
 - 4.3 Data security and privacy

Thus, India need to incorporate global best practices to eliminate existing challenges like Israel - Kibbutz model, and challenge rural industrialisation strategy, China - multi lateral financing, precision farming, cold storage infrastructure to move India towards increasing export, inclusive development and to fulfill the vision of one dollar economy by 2030.

\$5 billion strategic retiring from oil mining in
V2.8-08 long free-up after privatize now act
allow to new etc new as. privatize
allow etc to plant use no short hold
allow short etc if misprice ref leads
to V2.8 annex holdover entitlement by

Water scarcity is one of the major challenges in Indian agriculture. Evaluate the role of micro-irrigation technique in addressing this issue and discuss the policy measures needed for their widespread adoption.

India is home to approximately 18% of the world's population but India have just 4% of freshwater resources of the world and according to NITI Ayog report 80% of freshwater i.e. of (4%) are used in agriculture and whose efficiency is 40% to 70% and much of water is wasted which makes water crisis more worse.

ROLE OF MICRO-IRRIGATION TECHNIQUE

Minimising water wastage

1.1 drip irrigation and sprinkler method has water efficiency with 90-95% and 80-85%. respectively. So with the use of micro irrigation India can save half of the water used for irrigation of agricultural field.

1.2 Agriculture irrigation consumes 80% of

~~fresh water of India. Saving half of the water by micro-irrigation means saving about 40% of fresh water of India.~~

2. GIVES PRECISION FARMING

Micro irrigation provides required water directly to the plants root or stem thus consuming less water. whereas in traditional irrigation system water get evaporated and not utilised optimally.

3. INCREASE FARMER'S INCOME

Micro irrigation reduce cost of input production through saving electricity, fertiliser, labour cost and this lead to increase ultimately overall farmer's income.

4. ENHANCE SOIL FERTILITY

Fertiliser with desired amount and need are getting mixed with water and supplied to plant's root directly through drip irrigation system and this reduces the overuse of fertiliser and increases soil fertility.

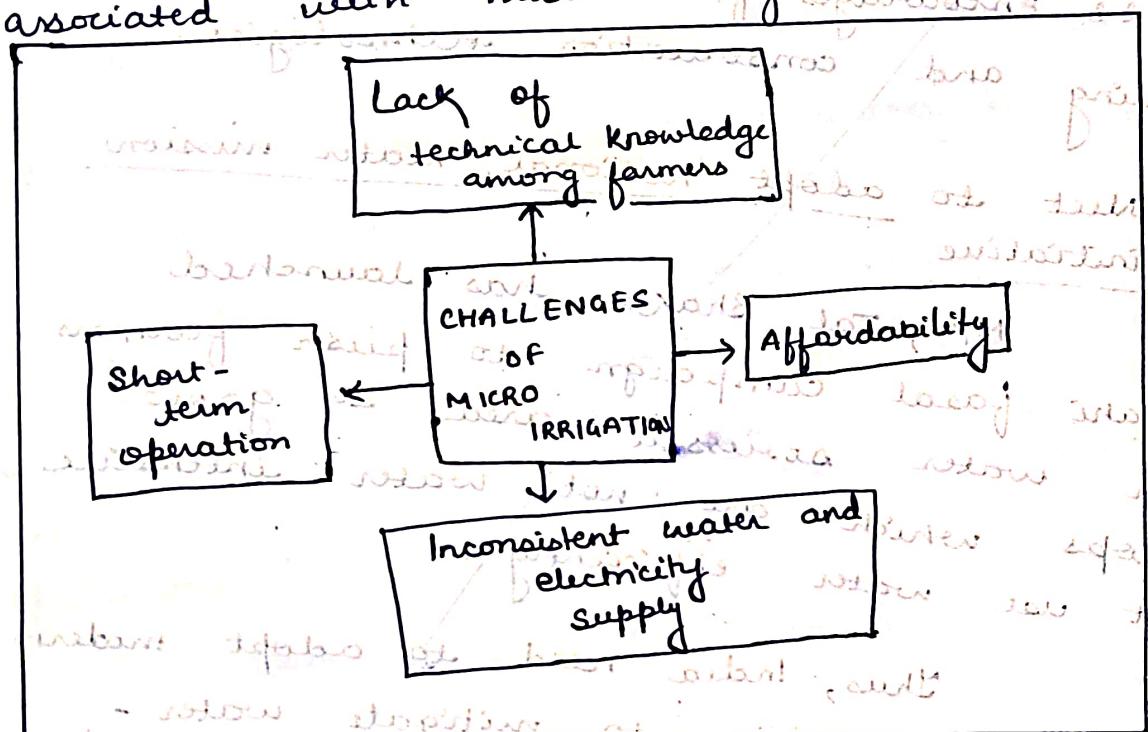
5. INCREASING PRODUCTIVITY

Average productivity of the land

has increased tremendously as it increases the area under crop production.

Ex:- Maharashtra, Chattisgarh got benefitted from this technique.

Despite these there are few hurdles associated with micro irrigation.



POLICY MEASURES

1. Pradhan Mantri Krishi Sinchay Yojana: It is a govt. program that aims to improve the productivity and water use efficiency.

1.2 It introduces sustainable water conservation practices.

2. Per drop more crop

2.1 It is a part of PMKSY that promotes water saving technologies like drip and sprinkler irrigation.

2.2 Encourages farmers to use water saving and conservation technologies.

3. Need to adopt national water mission like initiative

M/o, Jal shakti has launched Sahi fasal campaign to push farmers in water stressed area to grow crops which are not water intensive but use water efficiently.

Thus, India needs to adopt modern irrigation facility to mitigate water stressed situation - as rightly suggested in the book of water for food and water for life that smart agriculture leads to 50% conservation of water and 30% yield growth. Adopting this method India will be able to fulfill SDG goals i.e. no hunger by promoting food security and inclusive development.