

Should the groundwater, for the purpose of cultivation of rice needs to be discouraged? If not how groundwater can be used effectively for cultivation? Explain.

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China and India largest producers and consumers of rice varieties of the world feed more than $\frac{2}{3}$ rd population through PDS and exports. For South East Asian countries, rice exports occupy major share of exports. eg: Vietnam, Philippines. Resultant depletion on groundwater, water stress is making rice cultivation a difficult affair.

Groundwater depletion - Anathema to rice agriculture?

1) Misconception:-

IRRI, Manila reports that rice cultivation doesn't require field flooding throughout the year.

2) Aquifer mapping:-

Groundwater extraction can occur as long as the aquifer gets continuous source of recharge, balances sink.

3) Encourage judicious usage

Further groundwater extraction gives the autonomy, responsibility of the farmer to use judiciously unlike canal system. Electricity cost also plays role in rate of extraction.

4) Dry Seeded Rice varieties:-

IRRI estimates that DSR rice varieties reduces 15-35% of the irrigation needs. This helps mitigate the water stress and cost saving.

Thus, groundwater extraction need not be discouraged all together for purpose of rice cultivation.

EFFECTIVE UTILISATION

Being an important component of staple diet, rice based diet

is feeding world hunger, chugging towards SDG goals. The ⁽²⁾ production is said to increase with subsequent population growth projection. Thus climate resilient agriculture techniques must be adapted to continue rice cultivation.

1) Groundwater levy

Central water Commission's groundwater levy can be encouraged to check excessive usage. It acts as a deterrent to input cost.

2) Rationalize electricity subsidy

Punjab accounts for 80% of centres rice distribution pool, indicating of tubewell based extraction which resulted in depletion. Thus subsidy for solar pumps, electricity must be implemented to delicate balance.

3) Dry and wet irrigation practices

As flooded irrigation is not required crisscross traditional dry, wet irrigation can be encouraged that reduces 20% of water requirement.

4) Topography based agriculture

Genetic engineering techniques, Modified tolerant rice varieties can be encouraged.

→ Dry Seeded rice varieties with zero till agriculture

→ Sub1 gene in Swarna rice varieties for coastal, low lying flooded areas. eg. Farm Pokhali rice

→ Salt tolerant varieties in coastal areas. eg. Saltol gene harnessing

Bow varieties Rice genome mapping project gives impetus to techniques

These methods must be aided by rainwater harvesting, water recycling, drip & sprinkler techniques to make groundwater usage effective. Diversification of rice varieties like Fe, Zn, Vitamin A (golden rice), low glycemic index varieties increases growth distribution, avoids malnutrition deficiencies.