

## General Studies-3; Topic: Energy

### Grid Connected Solar Irrigation

#### 1) Introduction

- Agrarian distress is real and persisting and water is growing into an ever bigger human crisis.
- The human and fiscal cost of the downward-spiralling nexus between energy, water, and agriculture is staggering.
- India cannot address its water and energy economy without addressing agrarian distress and finding non-agriculture income options.
- Rapidly falling prices of solar technology and the recently announced KUSUM scheme of the Centre offer a promising solution.

#### 2) Present Agrarian Status

- More than 80 per cent of freshwater is used by agriculture, and more than 60 per cent of India's irrigated agriculture is via groundwater.
- "Unmetered" and subsidised energy for agriculture has created a recurring fiscal pressure.
- Repeated bailouts of the State power sector reflect the way the state power sector has been managed and governed.
- Sixty-five per cent of India's rural population depends on 15 per cent of its GDP contributed by agriculture.
- Average income of agriculture household in India is less than ₹9,000 per month of which only about half is contributed by farm income (NABARD All India Financial Inclusion Survey 2017).

#### 3) KUSUM Scheme

- The scheme is for farmers for installation of solar pumps and grid connected solar power Plants, with an objective of providing financial and water security to farmers.
- **The KUSUM scheme has three components:**
  - a. Private sector led large-scale solar at sub-station
  - b. Off-grid solar irrigation
  - c. Grid-connected solar irrigation
- All three components combined; the scheme aims to add a solar capacity of 25,750 MW by 2022.
- Component (a) and (b) only improve power supply but cause further damage to groundwater.
- Component (c) can potentially double the farm income, save groundwater, save subsidy for the State government, and generate jobs.

#### 4) Benefits of Grid Connected Solar Irrigation

- Connecting the solar irrigation pumps to the grid to sell surplus electricity provides an additional source of income for the farmer.
- This has been demonstrated by International Water Management Institute (IWMI) through a pilot project in Dhundi.
- Farmers get daytime, reliable, free power supply which reduces their production risk
- Punjab farmers have demonstrated a saving of about 30 per cent due to day time power supply and ability to optimise use of water.
- Recurring power subsidy to agriculture would get replaced by one-time capital subsidy
- Discoms would get cheap decentralised distributed generation that would reduce their network losses.

- During drought and crop failure, farmer can reduce the scale of agriculture and earn more money from sale of power.
- It could save the Government the subsidy it spends.

### 5) **Concerns / Challenges**

- If a significant number of individual farmers are unable or unwilling to solarise, their power and water consumption would go up since power will be now available for almost 10 hours a day every day, and even subsidy burden on the government would increase.
- Illegal use and bypassing of meters could increase.
- Risk of delays and defaults in payment for purchase of power by financially distressed Discoms.

### 6) **Way Forward**

- Grid connected solar irrigation should be made available only if at least 70 percent farmers participate and establish a Farmer Producer Company (FPC) or cooperative.
- The FPC should sign the power purchase agreement (PPA), maintain the feeder, and carry out energy accounting based on net meters at the farm and at the sub-station.
- Formation of FPC would check power theft.
- Dynamism of private sector should be tapped to create FPCs.
- Formation of FPCs, financing and mobilising farmers to participate would be the most sustainable model of doubling farm income, saving water, and eliminating anarchy in the agricultural power supply.
- The government should create a “KUSUM Mission” with adequately funded anchor organisation at the Centre and similar organisation in each participating State.
- These organisations should draw staff from agriculture, water, energy and financial sectors from the public, private, and civil society entities and should be led by a hand-picked leader with a clear target of achieving 20 per cent solar conversion within five years.

### 7) **Conclusion**

- The agriculture distress, water crisis, and fiscal distress caused by the power sector, has set a fertile ground to take advantage of affordable solar and achieve two grand objectives of doubling farm income and improving India’s water security.