Solar Feeders for Powering Agriculture

What is the issue?

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The crucial need for uninterrupted and affordable power supply for agriculture makes solar power a viable option.

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How significant is electricity for agriculture?

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- Agriculture is a major consumer of electricity, accounting for one-fourth or one-third of consumption in many States.
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- Two-thirds of the total irrigated area in India uses groundwater pumping, powered by more than 2 crore electric and 75 lakh diesel pumps.
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- So access to groundwater largely depends on reliable and affordable electricity supply.
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- This is an important issue as it concerns livelihoods of the rural poor and food security of the country.
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What is the complexity and challenge?

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- Since the 1970s, agriculture in many States has been receiving electricity at either low tariffs or for free. Much of this supply is un-metered.
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- Due to lower tariff and poor revenue collection, agricultural sales are often seen as a major reason for distribution companies' (discoms) financial losses.
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- Part of this loss is then recovered through higher tariffs for other consumers like industry and commercial (called cross-subsidy).

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- The remaining loss is made up through direct subsidy from the State governments.
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- So being seen as a loss-making sector, agriculture often gets poor quality supply leading to problems such as frequent pump burn-outs and power failures.
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- Restoring supply takes a lot of time and so does getting new connections.
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- Further, the supply is unreliable and often available only during late nights. All these factors make farmers distrustful of discoms.
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- Further, electricity demand for agriculture is expected to double in the next 10 years.
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- Also, as the average cost of supply keeps increasing, the problem of agriculture subsidies will become worse.
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What are the possible solutions?

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- Any solution must first provide reliable, adequate day-time electricity supply to farmers at reasonable tariff.
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- This should lead to a gradual increase in the mutual trust between the discom and the farmer.
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- This should also reduce the subsidy requirement for it to be truly scalable across the country.
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- Three ongoing developments allow for encouraging possibility in this regard -
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1. low cost electricity from solar, at Rs. 2.75-3/unit and at a fixed price contract

for 25 years
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2. States exponentially increasing their solar procurement to fulfil the national objective of increasing the use of solar power
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3. the grid has reached every village; agriculture feeder separation (lines carrying electricity to pumps and villages are physically separated) has progressed significantly
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What are the schemes in this regard?

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- **Maharashtra** - The 'Chief Minister's solar agriculture feeder programme' is a programme that takes advantage of the above developments.
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- A solar agriculture feeder is essentially a 1-10 MW community scale solar PV power plant, which is interconnected to the 33/11 kV sub-station.
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- A 1 MW solar plant can support around 350, 5 hp pumps and requires around 5 acres of land to set up.
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- The plant can be set up in few months and there is no change at the farmer's end.
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- Pumps need not be changed and farmers do not have to take responsibility of installation and operation.
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- All the pumps connected to the separated agriculture feeder will be given reliable day-time electricity for 8-10 hours between 8 am and 6 pm.
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- When solar generation is low, balance electricity can be drawn from the discom; when pumping demand is low, excess solar electricity will flow back to the discom.
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- Project developers are selected through a competitive-bidding process.
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- The entire electricity would be bought by the discom through a 25-year contract.
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- **Central scheme** - The Centre has proposed a similar scheme at the national level, namely, KUSUM, with a 10,000 MW target.
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- The KUSUM scheme (Kisan Urja Suraksha evam Utthaan Mahabhiyan) provides for -
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i. installation of grid-connected solar power plants each of capacity up to 2 MW in the rural areas
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ii. installation of standalone off-grid solar water pumps to fulfil irrigation needs of farmers not connected to grid
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iii. solarization of existing grid-connected agriculture pumps (make farmers independent of grid supply, enable them to sell surplus solar power generated to discom and get extra income)
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iv. solarization of tube-wells and lift irrigation projects of Government sector
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What are the advantages?

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- The electricity grid availability in every village along with national feeder separation programme makes it a cost-effective and rapidly scalable approach.
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- Apart from ensuring day-time reliable power for the farmers, it requires no capital subsidy from the government.
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- Rather, it is cost-effective, thereby enabling reduction in subsidy.
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- Also, no new large transmission lines are needed (has been a bottleneck for various large scale wind and solar power tenders).
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- Deployment is possible under the existing regulatory framework.
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- This approach can also provide distributed jobs to local youth in construction, operation and maintenance of the plant.

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- Furthermore, the future programmes could link deployment of such solar feeders to -
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i. reduce unauthorised use/connections
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ii. improve metering and tariff recovery
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iii. facilitate energy efficient pumps and water saving approaches, etc
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Source: Business Line

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