

A Ray of Self Dependency by the Energy of Sun for the Indian Farmers through PM KUSUM Scheme

Khushboo Bhati

Ph. D. Scholar, Dept. of Agricultural Extension & Communication
N. M. College of Agriculture, N.A.U., Navasari

ARTICLE ID: 28

ABSTRACT

Ministry of New and Renewable Energy (MNRE) have launched the *Pradhan Mantri Kisan Urja Suraksha evam Utthan Mahabhiyan* (PM KUSUM) Scheme for farmers for installation of solar pumps and grid connected solar and other renewable power plants in the country. The scheme will open a stable and continuous source of income to the rural land owners for a period of 25 years by utilisation of their dry/uncultivable land. Further, the proposed scheme would ensure that sufficient local solar/ other renewable energy based power is available for feeding rural load centres and agriculture pump-set loads, which require power mostly during the day time. The solar pumps will save the expenditure incurred on diesel for running diesel pump and provide the farmers a reliable source of irrigation through solar pump apart from preventing harmful pollution from running diesel pump.

Keywords: *Renewable Energy, Self-sufficiency, PM KUSUM, Agriculture*

Introduction

In his 2018 budget speech, Finance Minister Arun Jaitley outlined the contours of KUSUM (Kisan Urja Suraksha evam Utthaan Mahaabhiyan), a new scheme to subsidize solar irrigation pumps (SIPs) for farmers with the option to sell surplus power to distribution companies (DISCOMs) (ET 2018a). KUSUM would entail a total outlay of 1,40,000 crore over 10 years, of which the central government is to contribute 48,000 crore .(ET 2018b) Farmers are to contribute 10 per cent of the capital cost upfront, cover 30 per cent by bank loan while the remaining 60 per cent is to be borne equally by subsidy provided by Government of India and respective state governments.

Components of PM KUSUM Scheme

- **Component-A:** Setting up of 10,000 MW of Decentralized Grid Connected Solar or other Renewable Energy Power Plants on barren/fallow land;
- **Component-B:** Installation of Rs.17.50 Lakh stand-alone solar agriculture pumps; and
- **Component-C:** Solarisation of Rs.10 Lakh Grid Connected Agriculture Pumps.

All three components combined, the scheme aims to add a solar capacity of 25,750 MW. The total central financial support provided under the scheme is Rs. 34,422 crore including service charges to state implementing agencies. Part of central financial support i.e. Rs.10,000 Cr. is provided through GBS and balance Rs. 24,422 Cr is raised through EBRs by IREDA as Government Guarantee Bonds.

Table 1 : Allocations made to States under the Components of PM-KUSUM Scheme

S. No.	State	Component-A Sanctioned Capacity (MW)	Component-B Sanctioned Quantity (Nos)	Component-C Sanctioned Quantity (Nos)
1	Chhattisgarh	-	2000	-
2	Delhi	10	-	-
3	Haryana	25	15000	468
4	Himachal Pradesh	-	550	-
5	Jharkhand	10	10000	500
6	Gujarat	-	4000	-
7	Karnataka	50	6000	-
8	Kerala	10	-	5200
9	Madhya Pradesh	100	25000	15000
10	Maharashtra	300	30000	9000
11	Meghalaya	10	1700	60
12	Odisha	-	2500	-
13	Punjab	30	4500	3900
14	Gujarat	40	-	-

15	Himachal Pradesh	10	-	-
16	Rajasthan	325	25000	12500
17	Tamil Nadu	-	17500	20000
18	Tripura	5	1300	1300
19	Uttar Pradesh	75	8000	1000
Total		1000	171050	68928

(Source – Annual Report 2019-20 of Ministry of New and Renewable Energy)

The incremental changes of PM KUSUM

- 25,750 MW solar capacity can power about 11.5 million 3 HP (horsepower) pumps or 7 million 5 HP pumps.
- At present, nearly 30 million irrigation pumps are estimated to be operating in India. Of this, 21 million are electric and 9 million are diesel-based. The KUSUM scheme can potentially convert one-third to one-fourth of all irrigation pumps into solar-powered pumps in a short period of 3 years.
- This rapid transition is possible as the scheme makes buying pumps extremely affordable for medium-sized and large farmers.
- It comes with 30% subsidy from the central and state government each, and there is a provision to take bank loans for 30% of the cost.
- So, farmers have to shell out only 10% of the cost to buy solar pumps.

Benefits of PM KUSUM

- The scheme is good to increase farmers' income in the short term.
- As solar power is cheaper than diesel off-grid, solar pumps will reduce the cost of irrigation significantly.
- The effect is substantial in states like Bihar where farmers largely use diesel pumps.
- This will allow farmers to grow more crops (even the water-intensive ones), at a lower cost of cultivation, thereby increasing income.
- In Punjab, electric pumps dominate and the power subsidy to the agricultural sector is about Rs. 7000 crore annually. So, solarisation of agriculture feeders will reduce the subsidy burden significantly.



- Farmers' income will also be augmented by selling electricity from solar plants on to the discoms.
- The most important part of the solar pump is that the solar cycle matches the irrigation cycle.
- So, farmers will get assured irrigation for at least 6 hours during day time, and they do not have to remain awake at night to irrigate their farms.

How to avail the financial assistance

Component A: The renewable power generated will be purchased by DISCOMs at a feed-in-tariff (FiT) determined by respective State Electricity Regulatory Commission (SERC). DISCOM would be eligible to get PBI @ Rs. 0.40 per unit purchased or Rs. 6.6 lakh per MW of capacity installed, whichever is less, for a period of five years from the COD. For Component A, DISCOMs will be implementation agencies

Component B & C: State-wise allocation for solar pumps and solarisation of existing grid-connected pumps will be issued by MNRE once in a year, after approval by a Screening Committee under the chairmanship of Secretary, MNRE. Funds up to 25% of the MNRE benchmark cost or cost discovered through tenders, whichever is less, for the sanctioned quantity would be released as advance to the implementing agency only after placement of letter of award(s) to the selected vendors. For Component B, DISCOMs/ Agricultural Department/ Minor Irrigation Department/ any other Department designated by State Government will be the implementing agencies. For Component C, DISCOMs /GENCO/ any other Department designated by State Government will be the implementing agencies.

Each State will nominate implementation agency in that State for each of the three components.

Ecological and Economical Impact of Solar Irrigation Pumps

KUSUM can be a game-changer for India's irrigation and energy economies. For farmers in western India, hassled by unreliable and night power supply, SIPs offers relief by providing uninterrupted day-time power. Up to 6 per cent of India's total GHG emissions emanate from groundwater irrigation. Replacing diesel and electric pumps by SIPs will significantly reduce the carbon footprint of Indian agriculture. The biggest gainers are DISCOMs. Depending on location and pumping depth, every grid- connected pump replaced by a SIP can save the country farm power subsidy ranging from Rs. 35000 to 90,000/year.



However, SIPs have two downsides, economic and ecological. A SIP costs next to nothing to operate but entails 10-15 times larger capital investment compared to diesel or electric pumps. An SIP owner will always be tempted to 'encash' free solar energy by irrigating water intensive crops, increasing cropping intensity and selling more water to neighbours at a low price—all of which will increase groundwater draft, deepening the crisis in western India's parched aquifers. Free electricity is blamed for groundwater over-exploitation from Punjab down to Tamil Nadu, but its destructive impact is limited by restricted hours and unreliable supply. With reliable day-time free solar power, SIPs can be way more lethal for our aquifers. The need is to promote SIPs as an integrated energy-water livelihoods solution rather than merely a 'green' energy solution. With its energy buy-back option, KUSUM will promote solar energy as a remunerative cash crop that farmers can 'grow' for their irrigation needs and additional income from energy sales.

Steps Taken to Attract Farmers toward This Scheme

The only way to get them to willingly give up grid power for solar energy is to offer them a deal better than free grid power: free, day-time reliable solar power plus a remunerative FiT for their metered surplus solar power. The Union Budget 2020 has laid a major emphasis on use of solar energy for farming under the ambitious Pradhan Mantri-KisanUrja Suraksha evamUtthan (PM-KUSUM) scheme with finance minister Nirmala Sitharaman extending the scheme's implementation with new targets. She proposed to extend the scheme to allow 20 lakh farmers to set up standalone solar pumps. In addition, the scheme will allow farmers to set up grid-connected solar power generation capacity on fallow and barren land.

Conclusion

For best socio-ecological outcomes, KUSUM's top priority should be to ensure that SIPs substitute existing diesel and electric pumps rather than complement them, as is currently happening. For our 5.3 million diesel irrigation pump irrigators in eastern India, 60 percent capital cost subsidy under KUSUM will be strong incentive to solarize especially with a streamlined subsidy-loan delivery eco-system. However, its beneficial impact on pro-poor irrigation can be multiplied by an accompanying subsidy on buried PVC piped distribution system. From free or subsidized grid power to solar power should be the key objective of KUSUM. Achieving this will be a challenge that can only be met by making it attractive for



farmers to economise energy (and water) use in irrigation and sell more solar power to the DISCOMs.

References

Amjath-Babu, T.S., Aggarwal, P., Vitale, J., Purohit, P. and Shah, T. 2018. Centralized versus decentralized solar electricity for groundwater pumping to farmers facing climatic risks: Implications on crop choice, profitability and resource degradation. *Agricultural Water Management* (submitted).

ET 2018a. Cabinet to vet 48K crore KUSUM scheme for solar power by March. *Economic Times*, February 20. `

ET 2018b. Cabinet nod soon for 50,000 crore KUSUM scheme on solar farming. *Economic Times*, April 03. `

Franklin, B. 2015. Solar Irrigation Pumps: Can Electricity Buy-back curb groundwater over-use? Presented at the ICID's 26 Euro-Mediterranean Regional Conference and Workshop on "Innovate to improve Irrigation performances", 12-15 October 2015, Montpellier, France.

Gupta, E. 2017. Extending Solar Water Pump Subsidies: Impact on Water use, Energy use and Cropping Patterns in Rajasthan: Difference in Differences Analysis, SANDEE Working Paper, September,

ITP (2018): "Promoting Solar Irrigation Service Providers in Ganga Basin: Jobs, Affordable Irrigation and Accelerated Green Revolution". Unpublished report, Anand: IWMI-Tata Water Policy Program (ITP).

ITP.2017. Fifth Census of Minor Irrigation Schemes 2013-14. Report submitted to the Ministry of Water Resources, River Planning and Ganga Rejuvenation (MoWR), Government of India, Anand: IWMI-Tata Water Policy Program (ITP).

Kishore, A., Shah, T. and Tewari, N.P. 2014. Solar irrigation pumps: Farmers' experience and state policy in Rajasthan. *Economic & Political Weekly*. **49(10)**: 55-62.

Shah, T. 2009. Climate Change and Groundwater: India's Opportunities for Migration and Adaptation. *Environmental Research Letters*. **4(03)**:5005 (13pp).

Shah, T., Durga, N., Rai, G.P., Verma, S. and Rathod, R. 2017. Promoting Solar Power as a Remunerative Crop. *Economic & Political Weekly*. **52(45)**: 14-19.

Srivastava, A. 2018. Solar Power could aid reforms in India's electricity distribution system. *Business World*, April 4.