



## 24 x 7 free agriculture supply: Lessons from Telangana's unique initiative

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### 1. Background

In 2018, Telangana (TS) became the only state in India with a high proportion of agriculture power consumption to implement 24x7 free power supply to all farmers. In other such states, agricultural supply is restricted to 8-10 hours in a bid to curtail outflow of subsidy and conserve resources. Telangana was providing 7 hours of free power supply to its unmetered farmers in 2014 and the hours of supply was increased to 9 hours in 2016. After a pilot project of 24 x 7 supply in a few distribution circles in 2017, it was extended to the whole state from January 01, 2018, with full page advertisements released all over the country.

The practice of providing 7 to 9 hours of supply is not fair to farmers but it helps DISCOMs to optimise generation, transmission and distribution capacities. This is due to the flexibility to manage the demand and load profile of agriculture. Providing 24 x 7 supply to agriculture does indeed correct this unfair treatment to farmers but it comes at the cost of investing on higher generation and distribution capacities. Electricity consumption increases and challenges in its estimation becomes more complex. Since agriculture supply is free, the subsidy burden increases. It also can have an adverse impact on groundwater extraction, though cropping pattern and water use efficiency also play significant roles in this.

24 x 7 power supply to agriculture is being projected as a success story in Telangana. Higher agriculture demand is given as one of the justifications for ambitious power capacity addition and high distribution investment. The government has also been claiming that this initiative will result in 24 x 7 three-phase power supply to rural areas, catalysing rural development. It is thus important to have a close look at this initiative.

### 2. Challenges of 24 x 7 power supply to agriculture

Two years have passed after 24 x 7 power supply was announced to all agriculture pumpsets connected to the Low-Tension distribution network in Telangana. The challenges faced with the implementation and impacts of this initiative is detailed below. This is largely based on few available documents, inputs from farmer organisations and media reports.

#### Consumption estimation and subsidy

Table 1 shows the growth in number of pumpsets, annual consumption and committed state subsidy to agriculture. The YoY growth in the number of pumpsets is around 5%. But there has been a 28% increase in consumption between 2016 and 2017 and a 25% increase in subsidy. This is attributed to the increase in hours of supply from 7 to 9 hours. There is a 21% increase in consumption between 2018 and 2019 and 45% increase in subsidy, attributed to the increase in supply to 24 hours in some circles from July 2017 and all state from January 2018.

*Table 1. Annual growth in agriculture supply in Telangana*

Year	Pumps (lakhs)	Consumption (MU)	State Subsidy (Rs. Cr)
2015	19	11,671	2,267
2016	20	11,190	2,635
2017	21	14,374	3,305
2018	22	11,765	3,236
2019	23	14,262	4,687

Source: Prayas (Energy Group) from ARR of DISCOMs (2018-19) and Tariff orders for different years

Note: Data from 2015-2017 are actuals reported in the 2019 DISCOM ARR; Subsidy and 2018 and 2019 data are from Tariff orders; 2015 agriculture subsidy is Prayas estimate from 2019 ARR, since there was no tariff order for 2015

Since agriculture pumpsets are not metered in TS, consumption has to be estimated based on Distribution Transformer (DT) based consumption norm approved by the Commission <sup>3</sup>. The norm is estimated based on annual energy readings from sample DTs across the state. DISCOMs have been stating that valid readings from all DT meters are not available due to metering problems. DISCOMs also have not increased the sample size of DTs, even though the number of DTs has significantly increased. <sup>4</sup>This calls into question the veracity of the DISCOMs claims for agricultural sales.

In the ARR filings made in January 2018, DISCOMs stated that based on meter readings from sample DTs, agriculture consumption/kVA increased by 33.36 % in TSSPDCL and 39.33% in TSNPDCL after pilot implementation of 24 x 7 power supply for a few months. TSERC in its tariff order approved 21% increase in consumption. Since there were no ARR filings after this, no further data is available on the agriculture consumption. TSERC had commissioned Administrative Staff College of India (ASCI) to in 2017 to develop a better method to estimate agriculture consumption. But information of the progress with this study is not available in the public domain.

Agriculture consumption would have increased due to increase in agriculture connections, increase in hours of supply and also because of reduction in use of diesel pumpsets at open wells, due to 24 x 7 power availability. <sup>5</sup> Data from load dispatch centre indicates that there was a 34% increase in Telangana peak demand between 2016 and 2017 (when agriculture supply was increased from 7 to 9 hours and power shortages reduced) and 12% increase between 2017 and 2018 (when 24 x 7 supply was introduced).<sup>6</sup> But these cannot be attributed to only agriculture supply and a realistic quantification of the increase in agriculture consumption require more scientific estimation techniques.

It is surprising that Telangana did not take up energy efficiency measures or solarisation of agriculture supply, unlike states like Andhra Pradesh or Maharashtra. AP has been installing solar pumpsets and in 2017, AP DISCOMs had taken up projects to replace about 1 lakh pumpsets with 5-star pumpsets. From 2017, Maharashtra has initiated projects for mini-solar plants (few MW capacity) to supply solar power to 11 kV feeders supplying agriculture pumpsets.

#### Challenges in quality of supply

Before introduction of 24 x 7 supply, there were many challenges in power supply to agriculture – supply at odd hours, frequent outages and long time to restore supply. Data on actual hours of supply to agriculture is not easily available. CAG's performance audit of TSSPDCL reports that between 2013-2016, most feeders in TSSPDCL area did not provide the committed 7 hours of supply. This was based on test check in Jan-March of each year in 3 distribution circles, which showed that all feeders had less than 7 hours supply in 2016. CAG report indicates that from 2017, the committed 9 hours of supply was given.<sup>7</sup> There is no publicly available data or analysis on the actual agriculture hours of supply after 2018.

Anecdotal evidence on agriculture supply, based on comments of farmer organisations during public hearings suggests frequent power outages, Distribution Transformer (DT) failures and long time to repair. Annual DT failure rate has been around 11-13% in the state in 2015 to 2017. While this average figure itself

is high, the failure rate is as high as 15-17% in rural circles like Mahbubnagar, Medak, Siddipet and Warangal, all of which have large number of agriculture connections. Electricity accidents have been another challenge of rural supply and available data show a steady increase in human fatalities, with 454 fatal human accidents in 2015, increasing to 678 in 2017.<sup>8</sup> Significant investment has been made in transmission and distribution infrastructure, but it is not clear how much of these have been to attend to the last mile connectivity, covering 11 kV feeders, DTs and LT system. Shortage of field staff to attend to rural consumer complaints has been an area of concern, and it does not appear that this challenge has been addressed.

#### Groundwater depletion

As per the state profile of Telangana given by the Central Ground Water Board, state is in the rain-shadow area and most part of the state is characterised by hard rock formations with shallow aquifers with limited water holding capacity. As for ground water exploitation, out of 584 Mandals, 52% are overexploited, critical or semi-critical in 2017. Borewells are 100 meters or deeper.<sup>9</sup>

In 2015-16, wells contributed to 87% of the net irrigated area in the state.<sup>10</sup> In most areas in Telangana for most part of the year, groundwater is sufficient for only a few hours of continuous pumping, after which it is necessary to wait for a few hours for groundwater to recharge. Since power supply was not reliable, most of the agriculture pumps had employed auto-starters, which ensure that the pump motor is turned ON whenever power is available. There were appeals to the farmers to remove or bypass auto-starters when 24 x 7 power supply was announced, but it is not clear how many have actually done so. It is quite likely that the pumps are continuing to operate even when there is no water, thus increasing electricity consumption and reducing the life of pump.

Some farmers have shifted to water intensive crops and have set up more pumps, some with higher capacity. Seeing the ground water impacts, in 2018, more than 200 villages passed resolutions urging the state government to withdraw the 24 x 7 power supply because it has resulted in a drinking water crisis. They requested for free power supply for 9 to 12 hours in two spells.<sup>11</sup> This suggestion was not followed up by the TS government.

#### No comprehensive review

It is interesting to note that 24 x 7 power to agriculture was not a part of the ruling party's election manifesto in 2014, or the Power For All agreement signed in 2015. Telangana's shift to surplus power with significant capacity addition and slower than anticipated load growth could have prompted the introduction of 24 x 7 supply to agriculture.<sup>12</sup>

Announcement of 24 x 7 power supply claimed that investment of Rs. 12,610 Cr was made in the past three years to strengthen the transmission and distribution infrastructure, and around Rs. 2800 Cr was specifically for 24 x supply. The pilot project of supplying 24 x 7 power to agriculture was carried out in four distribution circles during July to November 2017.<sup>13</sup> This was extended to the whole state for 10 days in November 2017 before announcing the initiative in January 2018. Despite significant investments and impact on subsidy, water and electricity use, there are no independent reviews by the SERC, DISCOMs, the government or any other agency.

It is high time that TS took up a comprehensive review of 24 x 7 supply to agriculture to assess the pros and cons. This should involve feedback from farmers, distribution companies and grass root organisations. Inputs to be collected include utilisation of distribution infrastructure, quality of supply and service, pump usage pattern, ground water usage and depletion, changes in cropping pattern, changes in consumption pattern in rural areas to assess growth of commercial enterprises due to 24 x 7 supply etc.

### 3. Lessons for Telangana and other States

As in most Indian states, majority of farmers in Telangana are marginal (62% with less than 1-hectare land) and small (24% with 1-2-hectare land).<sup>14</sup> 24 x 7 electricity supply can indeed be blessing for them, but without a detailed study, one is not sure if this is a pro-farmer and a pro-ecology measure. A farmer centric approach would explore power supply options based on the agro-climatic conditions and demands of the farmers. Since there is a demand for quality supply during the day time and tail-end solar power supply cost is lower than average power purchase cost, solar based options, especially solarising feeders which have significant agriculture pumpset load, would be a good option.<sup>15</sup> Along with power supply options, efforts should be made to improve irrigation efficiency, regulate ground water use, recharge bore-wells, promote suitable cropping patterns, and extend the required market and credit support to farmers.

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<sup>2</sup> This article is part of an ongoing series called Power Perspectives which provides brief commentaries and analysis of important developments in the Indian power sector, in various states and at the national level. The portal with all the articles can be accessed [here](#). Comments and suggestions on the series are welcome, and can be addressed to [powerperspectives@prayaspune.org](mailto:powerperspectives@prayaspune.org)

<sup>3</sup> See Para 180-182 in [Tariff order for 2015-16](#) by APERC

<sup>4</sup> See page 29 of [CAG Report 1 of 2018](#) on Telangana PSUs

<sup>5</sup> As per the [5th Minor Irrigation census](#) (released in 2017, data for 2013-14), about 10% of the wells in Telangana used electricity and diesel conjunctively.

<sup>6</sup> See Annexure I in the [Fourth quarterly report of SRLDC for 2018-19](#)

<sup>7</sup> [CAG Report 1 of 2018](#) on Telangana PSUs with a performance audit of TSSPDCL

<sup>8</sup> Data on DT failures and accidents are from the ARR filings of DISCOMs for different years upto 2018-19

<sup>9</sup> From the [Telangana ground water year book 2016-17](#), and [presentation](#) by Central Groundwater Board with 2013 data; and 2017 data is available at [Block-wise Ground water assessment table](#) at CGWB website

<sup>10</sup> Table 5.6 of [Telangana statistical yearbook 2017](#)

<sup>11</sup> News report in [Deccan Chronicle, 23/3/18](#)

<sup>12</sup> 24 x 7 power supply to agriculture in Telangana, [a report by M Thimma Reddy](#) (PMGER, February 2019)

<sup>13</sup> Karimnagar circle in TSNDCL; Nalgonda, Medak and Siddipet circles in TSSPDCL (from the [additional information SPDCL](#) and [additional information NPDCL](#) DISCOMs submitted to TSERC in January 2018, as part of 2018-19 tariff revision

<sup>14</sup> Data for 2011, from page 104 of [Telangana Statistical yearbook 2017](#)

<sup>15</sup> For details on solar feeder for agriculture, please visit [Prayas \(Energy Group\)](#) website